REVISED

AGENDA FOR THE WEST HAYMARKET JOINT PUBLIC AGENCY (JPA)

TO BE HELD THURSDAY May 5, 2011 AT 3:30 P.M.

CITY-COUNTY BUILDING
555 S. 10TH STREET
Room 303
LINCOLN, NE 68508

1. Introductions and Notice of Open Meetings Law Posted by Door (Chair Snyder)

2. Public Comment and Time Limit Notification Announcement (Chair Snyder)

   Individuals from the audience will be given a total of 5 minutes to speak on specific items listed on today's agenda. Those testifying should identify themselves for the official record.

3. Approval of the minutes from the JPA meeting held April 14, 2011 (Chair Snyder)
   - (Staff recommendation is for the JPA Board to approve the minutes as presented)

4. West Haymarket Progress Report (Jim Martin)
   - Public Comment

5. Bill No. WH 11-33 Resolution authorizing Jayne Snyder, Chair of the West Haymarket Joint Public Agency Board of Representatives, to execute all closing documents for the Second Closing between BNSF Railway Company and the West Haymarket Joint Public Agency. (Peo)
   - Public Comment
   - (Staff recommendation is for the JPA Board to approve the resolution)

6. Bill No. WH 11-34 Resolution approving an Award of Contract to Judds Brothers Construction for the Initial Haymarket Site Preparation Project No. 870703 ($5,120,645.70) and the USPS Parking Lot Reconstruction Project No. 870303 ($519,264.60) for a total cost of $5,639,910.30. (Figard/Blahak)
   - Public Comment
   - (Staff recommendation is for the JPA Board to approve the resolution)

7. Bill No. WH 11-35 Resolution approving Amendment No. 4 to the Agreement for Engineering Services for the West Haymarket Infrastructure Design Contract with Olsson Associates at an additional cost of $1,825,047.00. (Figard/Blahak)
   - Public Comment
   - (Staff recommendation is for the JPA Board to approve the resolution)

8. Bill No. WH 11-36 Resolution establishing a budget item for Engineering Services Division services to be provided to the West Haymarket Joint Public Agency. (Figard/Blahak)
   - Public Comment
   - (Staff recommendation is for the JPA Board to approve the resolution)

9. Bill No. WH 11-37 Resolution approving Change Order No. 1 to the TCW Construction Inc. Agreement for additional bid items at a cost of $14,469.00. (Jim Martin)
    - Public Comment
    - (Staff recommendation is for the JPA Board to approve the resolution)

10. Set Next Meeting Date: Wednesday May 25, 2011 3:30 P.M. (Room 112 Council Chambers)

11. Motion to Adjourn

WEST HAYMARKET JOINT PUBLIC AGENCY (JPA)
Board Meeting
April 14, 2011

Meeting Began At: 3:31 P.M.

Meeting Ended At: 4:45 P.M.

Members Present: Tim Clare, Jayne Snyder, Chris Beutler

Item 1 - Introductions and Notice of Open Meetings Law Posted by Door

Chair Snyder opened the meeting and advised that the open meetings law is in effect and is posted in the back of the room.

Item 2 – Public Comment and Time Limit Notification

Snyder stated that individuals from the audience will be given a total of five minutes to speak on specific items listed on today's agenda. Those testifying should identify themselves for the official record and sign in.

Item 3 – Approval of the minutes from the JPA meeting held March 30, 2011

Snyder asked for any corrections or changes to the minutes from March 30, 2011. Hearing none, Beutler motioned for approval of the minutes. Clare seconded the motion. Motion carried 3-0.

Item 4 – West Haymarket Progress Report

Jim Martin, Program Manager with SAIC, came forward and distributed the March Progress Report to the Board. The arena schematic design is moving into design development. Last week there was a schematic design budget review meeting in Minneapolis which went very well. The architects and Construction Team will be updating the Board on that later in the meeting. Work on the 10th and Salt Creek roundabouts has begun and will escalate after the Spring Game on April 16th. That project is on a tight schedule so that it will be done before the fall football season begins. The site preparation and Post Office front end project is out for bid and will open on April 20th. That contract will come before the Board for approval at the May 5th meeting. The M and N Street project is still pending due to some details that need to be worked out. Martin would like to open bids in June and start construction in July. As noted at the last meeting, construction on N Street will be delayed until next year so the new street isn't torn up as dirt is hauled onto the site.

The design on the Charleston Street Bridge continues with work possibly starting in late September. Design is also proceeding on the Amtrak Station, pedestrian bridge, and north

parking lot / festival space. The Remedial Action Plan for the voluntary cleanup program has been submitted to NDEQ for approval and they will be holding an open house for public comment on May 9th. The Environmental Team including Benesch, Miki Esposito and staff from SAIC will be present at the open house. At this point, the program is in great shape. Most of the design costs are now defined and all but two or three design projects are under contract. The next major step will be to compare estimates for construction as the projects are put under contract so we'll know exactly where we stand within the budget.

Snyder asked for comments from the public. Jane Kinsey came forward and asked why students are expected to stand in the arena for entire games. She did not think that was fair and wished to protest that and have the JPA look into other arrangements. Stan Meredith with the DLR Group noted that this was due to a request from the Athletic Department. Clare added that because this is a partnership with the University of Nebraska, their request to have the students stand must be honored. Students do this throughout the country at basketball and football games. Seats could be put in, but the students won't use them. Beutler asked if Kinsey had heard from students who don't want to stand. Kinsey stated that she hasn't but the information was only recently published in the paper. Beutler suggested that she check with some of the students because standing is part of the game ritual. Clare pointed out that he received a phone call from Marc Boehm, Associate Athletic Director at the University, after a drawing was put out showing the arena with only two areas for standing. Boehm expressed that their only request has been to have three areas for the students to stand, that is what the students and Athletic Department specifically wanted in the arena. Kinsey asked if the Athletic Department has polled the students. Clare advised Kinsey to contact Boehm to discuss the matter further.

Item 5 – Approval of Payment Registers

Don Herz, City Finance Director and JPA Treasurer, came forward to review the payments that were made in March. The payments made to the University of Nebraska were for geological testing. The first payment to SAIC was for work through November. Their December billing will come through in April. Herz pointed out that Snyder had previously asked about amounts that show a negative, those are there because a payment was entered and reversed. Instead of deleting it the report shows the entire results of the transaction. There was a payment made to Great Plains Appraisal for appraisal work on various projects. Gilmore & Bell were paid for the legal services they provided for the second bond issue. A payment was made to Fred Briggs Real Estate for property work at 10th and Salt Creek. A $6,000 payment was made to The State of Nebraska related to the voluntary cleanup project and Midwest Right of Way Services was paid for work involving the Jaylynn property. The rest of the transactions have been before the Board previously.

Clare inquired if the amount of the Qwest payment for fiber relocation is the same amount that was in their contract. Herz believes that is correct but he will confirm that for the Qwest and MCI payments. Beutler asked if Herz had reviewed all of the transactions and if they seem reasonable and legally appropriate. Herz answered that they were.

Beutler made a motion to approve the payment registers. Clare seconded the motion. Motion carried 3-0.

Item 6 – Review of the March 2011 Expenditure Reports

Herz explained that these reports show the total budget with expenditures and encumbrances being added as additional obligations are incurred. The first line item which does not have a budget is for costs that will be allocated to various projects. For example, the payment to SAIC was charged to that line item but their fee will be allocated to various projects. Herz will have that completed when he brings forward the April reports. Overall, everything seems to be in good shape.

Snyder asked for comments from the public. No one came forward.

Item 7 – Mortenson White Paper Update on Davis-Bacon

Dan Marvin introduced Derek Cunz from Mortenson and Bob Caldwell from Hampton Enterprises to the Board. At the last meeting, Marvin indicated they would release a report that quantifies the impact of Davis-Bacon on the project. The analysis that Cunz has done will hopefully help calm some of the concerns that have been expressed.

Cunz distributed a report that will be posted on the website later today. As part of their estimative process, Cunz also analyzed the impact of Davis-Bacon prevailing wages on the overall project budget. They reached out to approximately 200 suppliers and subcontractors to get their input on the budget, the cost of commodities, the timing of the project, the schedule of the project, and the scope of work that has been developed. One of the things asked of all the subcontractors and suppliers is what they would estimate the impact of Davis-Bacon to be on their work for the project. After gathering that information, Cunz estimates that the cost impact associated with utilizing Davis-Bacon prevailing wages for Lancaster County to be between $650,000 and $1 million. Included in the report is a detailed synopsis of subcontractors and suppliers by trade and scope of work indicating which noted a cost increase. That information was then used in the overall estimating process to determine the impact of Davis-Bacon. The last page of the report outlines the savings that the JPA realized by using the Recovery Zone Bonds, which shows a present value of $4 million. Using the high number that was estimated for the cost of Davis-Bacon, the JPA will save $3 million by using Recovery Zone Bonds on the project. Cunz noted that a key part of putting their budget together was to take into account local suppliers and the amount the local subcontractors pay their workforce so that the estimate is accurate for the community. Caldwell added that there was a high level of local participation in this estimating process.

Clare questioned if the analysis took into consideration the penalty if the bonds were paid off early as has been suggested. Cunz indicated that it did not. If their analysis had shown a huge cost that was over and above the savings, they would have then looked at the cost of buying the bonds down. Dan Marvin noted that he and Don Herz had discussed paying off the bonds and determined that due to the changing market conditions, the interest cost would have been significant. He also indicated that he will be active in terms of applying for energy savings grants, environmental cleanup grants and other opportunities for savings on this project.

Snyder asked for comments from the public. Jane Kinsey came forward and asked if there is any chance the guaranteed bonds would be withdrawn by the US Government in light of the budget problems. Herz advised that the only risk would be if the Federal Government went bankrupt.

Item 8 – Bill No. WH 11-26 Resolution to approve the Land Exchange Agreement between the West Haymarket Joint Public Agency, City of Lincoln, Nebraska, and Star City Federal LLC, pertaining to an exchange of land between the parties to accommodate construction of the 10th and Salt Creek Roadway Project including construction of certain parking lot improvements on property Star City Federal is acquiring in order to make Star City Federal whole from any loss of parking and functionality at its existing parking lot operation.

Rick Peo informed the Board that this agreement arises out of a need to acquire land from Star City Federal for the 10th and Salt Creek road improvement project. This agreement provides for surplus property to the west of their existing parking lot to be utilized to reconstruct parking that they will be losing. It was determined that the best thing to do was enter into a land exchange agreement in order to make them whole. A boot payment will also be made to Star City Federal because the amount of land they are giving to the JPA is greater than what they are receiving.

There is a substitute agreement before the Board today due to some minor clarifications that Star City Federal's investors requested. They asked for a better description of what the sidewalk improvements might be as they are concerned about the size of the sidewalk on the east side of their property. The JPA has elected to forgo those improvements but if they are done in the future Star City Federal will not be responsible for the maintenance or snow removal on that sidewalk.

Clare inquired as to how many more land exchange agreements will come forward in order to complete the arena site. Peo noted that there will be another with an agency that operates a parking facility to the west of Star City Federal, a land exchange or lease with the Post Office and a couple more conveyances between BNSF, the City and JPA.

Snyder asked for any comments from the public. Hearing none, Beutler made a motion to approve Resolution WH 11-26. Clare seconded the motion. Clare then made a motion to amend No. 1 to adopt the substitute agreement. Beutler seconded the motion. Motion to amend carried 3-0. Motion to approve Resolution WH 11-26 carried 3-0.

Item 9 – Bill No. WH 11-29 Resolution to approve DLR's Schematic Design drawings for the Arena

Dan Marvin introduced Stan Meredith from DLR Group to review the schematic designs with the Board. The floor plans have also been posted to the www.haymarketnow.com website.

Stan Meredith explained that the schematic design submittal is comprised of a number of documents including written narratives on the mechanical systems, electrical systems, and other systems. These drawings are the culmination of all of these systems. The site layout drawing shows the entire site with the arena in the middle. There is a ramp going up the east side to

parking in the northwest quadrant. With the public's input a parking garage containing 280 stalls has been included along with another 250 parking stalls that the University will utilize in the northeast corner. The main entryway is located in the SE quadrant. There is a shipping and receiving area for touring shows to load and unload as well as a separate shipping and receiving area for food services and concessions.

The event level will be located about 2 feet above the 500 year floodplain. Fans will come in through the main entryway and use escalators or elevators to access the main concourse. The University Athletic Department has worked closely with the design team to accommodate the students. They will have their own entry and area to cue up before basketball games so that when the doors open they can rush in. The students are well accommodated for with their own area for restrooms and concessions. Moving around the event floor, there are three auxiliary dressing rooms, green rooms and hospitality areas for acts and talent coming in from around the country. The accommodations for the men's and women's basketball program are in the northeast corner. The arena will have the ability to quickly change out uses of the event floor so that there could be a Sesame Street Live production in the afternoon and a basketball game later that evening.

The main concourse level will be the main entry from the pedestrian bridge. Fans will come to this level by stair, escalator or elevator and descend to their seats. The entire facility will be ADA accessible. The roof deck area on the south side has been extended and opened up to the general public. They will be able to go out there to enjoy the view of the State Capitol Building and West Haymarket development below them. Clare asked if there would be areas on the concourse for kiosks and vendors to set up. Meredith answered yes and pointed out that SMG and Caruso, a company internationally known for food service designs, are developing state of the art areas to service the fans.

The premium level is where the suites and loge level seating will be located. The Upper Concourse will hold restrooms and concessions. The team has utilized the design of the Xcel Energy Center in St. Paul as it has an elevated upper concourse so that when a fan leaves their seat to go to the restroom or concession, they can look back and have a view into the event level. Finally, the upper deck drawing shows all 16,000 fixed seats and an open area that can accommodate future growth of about 2,500 seats.

Clare inquired if there will be gathering places for people to visit on the various levels. Meredith indicated that there is unprogrammed space on the north side of the concourse level that could be set up with lounges as well as the hospitality areas located on the event level. There are several options available depending on the creativity of the operator, SMG.

Paula Yancey with PC Sports came forward to discuss the design from a budgetary standpoint. PC Sports was tasked with ensuring that the design is within the budget that was set forth by the JPA. Yancey distributed information showing the total construction estimate for the arena at $139.8 million and the parking garage at $10 million. There are $21.3 million in soft costs and $6.9 million in contingency, bringing the overall project budget for the arena and garage to $178 million. $1 million of preoccupancy expenses are not included in those numbers.

Beutler inquired if the $6.9 million is the owner's contingency. Yancey stated that it is and there is also a contingency within the Mortenson estimates which will be refined as they go through the design development and construction document phases.

Snyder asked for any comments from the public. Hearing none, Clare made a motion to approve Resolution WH 11-29. Beutler seconded the motion. Motion carried 3-0.

Item 10 – Bill No. WH 11-30 Resolution to approve Amended and Restated Construction Manager at Risk Contract with M.A. Mortenson Company

Paula Yancey informed the Board that this resolution is to approve the final version of the Mortenson Construction Manager at Risk contract. This has been reviewed over the past several weeks by several different entities and they are recommending approval of the contract. Buetler questioned if Yancey has reviewed contracts of this nature in the past and if everything in the contract is fair, reasonable and within the budget. Yancey answered that she is in the business of reviewing these kinds of contracts and believes it is a good well balanced approach to the construction of the arena. It covers everything it needs to cover and protects the owner, the contractor and the public in the construction of this building. Beutler asked if it contained any different or unusual provisions. Yancey noted that they had to follow the BNSF Railroad guidelines but other than that it is a fairly standard agreement.

Snyder asked for any comments from the public. Jane Kinsey came forward and stated that a major issue in getting the voters to approve this project was that there were going to be local jobs. She asked how the Davis-Bacon wage issue, which will bring in outside people, will fit with the promise to create local jobs. Dan Marvin advised that Davis-Bacon will have no impact on whether there are locals or nonlocals on the job. There has been a great effort to try and inform local subcontractors about what the tasks will be so they can respond to the bid packages when they come out. The West Haymarket website also shows those people who have procured contracts with the JPA, the dollar amounts of those contracts and if they are local or nonlocal businesses. At the last check the percentages were 88% local to 12% nonlocal. Those numbers may be a slightly different due to the SAIC contract which would be counted as nonlocal as well as the double roundabout contract that went to TCW which would be counted as local.

Hearing no other comments, Clare made a motion to approve Resolution WH 11-30. Beutler seconded the motion. Motion carried 3-0.

Item 11 – Bill No. WH 11-31 Resolution to approve Consultant Agreement with M.A. Mortenson Company to provide additional scheduling services for the overall West Haymarket Project for a lump sum of $500,000.00 including expenses

Paula Yancey explained that this agreement authorizes an additional component to the Mortenson/Hampton scope which allows for scheduling of the entire West Haymarket project. It creates one point for scheduling so that every project will be kept on one schedule. The cost of these services is estimated at $500,000. It is a not to exceed amount and includes all of the personnel and expenses to last the duration of the entire project. Snyder inquired if it goes over

budget would Mortenson make up the difference or come back to the Board. Yancey answered that it won't go over budget and if anything will be under budget.

Clare received comments from people who were concerned that this would be an added cost to the arena. He has been told that it is not an added expense and that the SAIC contract was reduced to shift the responsibility and cost to this contract. Yancey agreed and stated that the arena scheduling will be compensated within the arena budget. This is outside of the arena and will be spread across the various infrastructure projects throughout the entire West Haymarket.

Snyder asked for any comments from the public. Hearing none, Beutler made a motion to approve Resolution WH 11-31. Clare seconded the motion. Motion carried 3-0.

Item 12 – Bill No. WH 11-32 Resolution to approve Amendment No. 5 to SAIC Consultant Agreement to amend the Scope of Services to include peer review

Jim Martin reminded the Board that some of the previous reports stated that the soil in the arena site is not great. In fact, they are worse than first anticipated which will impact the type of foundation that is put under the arena. After meeting with Mortenson/Hampton they agreed that getting a second opinion could bring an opportunity for cost reduction in the site preparation geotechnical work or in the structural foundation systems for the arena. Martin would like Geiger Engineering, a firm well known for long span truss design, to look at the structural engineering for a cost not to exceed $5,500. He would also like to contract with Thiele Geotech for a cost not to exceed $7,900. The team agreed this would be a smart thing to do as there is a potential to save hundreds of thousands of dollars.

The poor soil on site is not associated with a pollution or environmental problem. The issues have to do with finding patches of sand in one area and clay a few feet over. The ultimate goal is to figure out how to get the most efficient and substantial foundation for the least cost. Beutler asked if this review is being requested to determine if the data gathered is correct. Martin stated that the data is correct. This type of soil will require a deep foundation and it is being recommended that they use auger cast piles. Those are formed by drilling down with a hollow auger, pumping cement down the middle, pulling the auger out and putting steel in to reinforce it. The question lies with how many piles are needed and if it is the best solution. Geiger and Thiele may look at the data and come up with a new idea or validate that this is the best foundation system.

Beutler inquired how Martin determines which operation or function will be peer reviewed. Martin explained that it could be cost driven but is usually based upon experience. Derek Cunz added that the big driver on this issue is that the team looked at other facilities they have built and determined that this was an outlier that didn't look right and they should get a second opinion to try and drive down the cost and get the best solution for this project.

Beutler asked if this was the first peer review done on this project and if there could be more. Martin answered that it is the first and it is possible there may be more. Beutler then asked who would be the liable and responsible party if the team builds on the information provided by the peer review group. Paula Yancey explained that the review group will make recommendations

that the structural engineer will incorporate if the recommendations are valid and acceptable. DLR is ultimately the Architect of Record and will be stamping and sealing the drawings. Stan Meredith added that anything that happens in the confines of this project has to be run through the Engineer of Record and the liability and ownership lies with that one individual. There will be no shifting of responsibility from the engineer who is responsible for the project.

Clare asked where Geiger and Thiele are located. Martin stated that Geiger is from outside of Nebraska and Thiele is located in Omaha. Geiger has created some of the lightest weight and most effective long span trusses in the world and are specialized in this type of project. Thiele does a lot of work in Lincoln and is very familiar with the type of soil on the site. Martin emphasized that this is nothing more than a second opinion to make sure the structure is done right and for the best cost.

Snyder asked for any comments from the public. Hearing none, Beutler made a motion to approve Resolution WH 11-32. Clare seconded the motion. Motion carried 3-0.

Item 13 – Set Next Meeting Date

The next meeting will be held on Thursday May 5, 2011 3:30 P.M. in Room 303.

Beutler made a motion to adjourn, Clare seconded the motion. Meeting adjourned at 4:45 P.M.

Prepared by: Melissa Ramos-Lammli, Engineering Services

Davis Bacon White Paper
West Haymarket Arena
Lincoln, Nebraska
April 11, 2011

Mortenson | Hampton recently completed the Schematic Design estimate for the West Haymarket Arena. From the onset of the estimating process, we understood that the project would require all work to be performed in accordance with the Davis Bacon Act. We utilized the Davis Bacon Determination for Lancaster County dated 10/29/2010 when calculating labor prices.

As the JPA had requested, an evaluation of the estimated impact of Davis Bacon wages on the project was performed concurrent with the estimating process. Mortenson | Hampton engaged over 200 subcontractors in the estimating effort to ensure that we received current pricing information from the local, regional, and national subcontractor markets. While discussing the Arena project with subcontractors, we requested the anticipated impact of Davis Bacon wages, if any, on their labor estimates for the arena work. Only a handful of subcontractors reported that Davis Bacon wages may have an impact on their pricing.

This survey provides a reasonable snapshot of the estimated impact of Davis Bacon wages on the project budget, but is not an absolute, considering that this is the first formal estimate of the arena, the design has only progressed to the schematic phase, and subcontractors that provided pricing information may or may not be the best value subcontractors that ultimately are selected to build the project.

At a summary level at this phase of the estimating process, our survey of the market suggests that the impact of Davis Bacon wages is between $650,000 to $1,000,000. The trades that indicated a potential increase due to Davis Bacon wages were: reinforcing steel, mechanical systems, electrical, overhead doors, drywall, carpet, scoreboards, and seating installation.

The majority of subcontractors that were surveyed did not advise us of an impact due to Davis Bacon wages. We believe this is largely due to the following: The Lancaster County wage determination is already very competitive with the local prevailing wages; the size and complexity of the arena project will attract larger subcontractors; larger subcontractors have the necessary bonding and insurance requirements required of the arena project; and larger subcontractors tend to pay a higher wage to retain their skilled employees. We also note that many of the local civil subcontractors already pay Davis Bacon wages, or higher, due to the requirements of other contracts on which they are working.

In conclusion, the JPA estimates it will save $7M over the life of the bond issue by taking advantage of bonds that require Davis Bacon wages to be paid on the arena. The present value of the bond savings is $4M. Using the conservative higher estimate of Davis Bacon wage impacts ($1M), less the $4M present value savings results in an overall savings to this project of $3M.

Mortenson construction | HAMPTON CONSTRUCTION

West Haymarket Joint Public Agency
West Haymarket Arena
Lincoln, Nebraska
Schematic Design Estimate Davis Bacon Sample Group

Description Subcontractor / Supplier	Comments
EARTHWORK	
A	All of these contractors have been paying Heavy / Highway Davis Bacon Wages for the Nebraska DOT work.
B	
C	
D	
E	
AUGER-CAST PILES	
A	All of these contractors indicated that they pay above the Davis Bacon Wages for Lancaster County.
B	
C	
D	
E	
F	
H	
I	
J	
SITE CONCRETE	
A	All of these contractors have been paying Heavy / Highway Davis Bacon Wages for the Nebraska DOT work.
B	
C	
D	
E	
F	
FENCES & GATES	
A	Company A pays more than Lancaster County DB, Company B unconfirmed.
B	
LANDSCAPING	
A	All four currently pay at or higher wages than Lancaster County DB.
B	
C	
D	
CONCRETE FORMING	
A	Both pay higher wages than Lancaster County DB.
B	

West Haymarket Joint Public Agency
West Haymarket Arena
Lincoln, Nebraska
Schematic Design Estimate Davis Bacon Sample Group

Description Subcontractor / Supplier	Comments
CONCRETE REINFORCING	
A	Company E indicated Davis Bacon was a premium. Other four are pay at or above Lancaster County DB.
B	
C	
D	
E	
STRUCTURAL PRECAST (STADIA, RAKERS, COLUMNS)	
A	All installation contractors pay above Lancaster County DB.
B (Fabrication Only)	
C (Fabrication Only)	
D (Install Only)	
E (Install Only)	
ARCHITECTURAL PRECAST	
A	All installation contractors pay above Lancaster County DB.
B	
C	
D	
E	
MASONRY	
A	Three companies pay at or above Lancaster County DB. The fourth company is unknown.
B	
C	
D	

West Haymarket Joint Public Agency
West Haymarket Arena
Lincoln, Nebraska
Schematic Design Estimate Davis Bacon Sample Group

Description Subcontractor / Supplier	Comments
STRUCTURAL STEEL	
A	All installation contractors pay above Lancaster County DB.
B	
C	
D	
E	
F	
G (Fabrication Only)	
H (Fabrication Only)	
I (Fabrication Only)	
J (Installation Only)	
K (Installation Only)	
L (Installation Only)	
M (Installation Only)	
N (Installation Only)	
MISCELLANEOUS METALS & METAL STAIRS	
A	All pay at or more than Lancaster County DB.
B	
C	
METAL RAILINGS & ORNAMENTAL METAL	
A	All pay at or more than Lancaster County DB.
B	
C	
FINISH CARPENTRY & ARCHITECTURAL WOODWORK	
A	All pay at or more than Lancaster County DB.
B	
C	

West Haymarket Joint Public Agency
West Haymarket Arena
Lincoln, Nebraska
Schematic Design Estimate Davis Bacon Sample Group

Description Subcontractor / Supplier	Comments
MFG. ROOFING & WALL PANELS	
A	All pay at or more than Lancaster County DB.
B	
C	
D	
E	
F	
G	
SINGLE-PLY TPO MEMBRANE ROOFING	
A	All pay at or more than Lancaster County DB.
B	
C	
D	
E	
F	
G	
DOORS, FRAMES & HARDWARE	
A	Estimate install includes wages higher than DB wages.
B	
OVERHEAD COILING DOORS	
A	One indicated a premium for Lancaster County DB. All other pay at or above Lancaster County DB.
B	
C	
STOREFRONT, WINDOWS & CURTAIN WALL	
A	All pay at or more than Lancaster County DB.
B	
C	
D	
E	
F	
G	

West Haymarket Joint Public Agency
West Haymarket Arena
Lincoln, Nebraska
Schematic Design Estimate Davis Bacon Sample Group

Description Subcontractor / Supplier	Comments
GYPSUM BOARD FRAMING SYSTEMS & ACT	
A	One indicated a premium for Lancaster County DB. All other pay at or above Lancaster County DB.
B	
C	
D	
E	
TILE & TERRAZZO	
A	All pay at or more than Lancaster County DB.
B	
C	
D	
FLOOR TREATMENT & SPECIAL FLOORING	
A	All pay at or more than Lancaster County DB.
B	
C	
D	
E	
F	
G	
CARPET & RESILIENT FLOORING	
A	One indicated DB was a premium. Other two pay at or above Lancaster County DB.
B	
C	
ACOUSTICAL WALL TREATMENT PANELS	
A	All pay at or more than Lancaster County DB.
B	
C	
D	
E	

West Haymarket Joint Public Agency
West Haymarket Arena
Lincoln, Nebraska
Schematic Design Estimate Davis Bacon Sample Group

Description Subcontractor / Supplier	Comments
PAINTING	
A	All pay at or more than Lancaster County DB.
B	
C	
D	
E	
F	
WALL PROTECTION	
A (supply only)	Estimate install included wages higher than DB wages
B (supply only)	
C	
D	
SCOREBOARDS & MATRIX DISPLAYS	
A	One indicated DB was a premium. Other three pay at or above Lancaster County DB.
B	
C	
D	
MULTIPLE SEATING & PLATFORMS	
A	One company indicated Lancaster County DB would be a premium. All other pay at or above Lancaster County DB.
B	
C	
D	
E	
F	
G	
ICE RINK	
A	All pay at or more than Lancaster County DB.
B	
C	

West Haymarket Joint Public Agency
West Haymarket Arena
Lincoln, Nebraska
Schematic Design Estimate Davis Bacon Sample Group

Description Subcontractor / Supplier	Comments
ELEVATORS & ESCALATORS	
A	All pay at or more than Lancaster County DB.
B	
C	
D	
MECHANICAL	
A	One indicated DB was a premium. Other three pay at or above Lancaster County DB.
B	
C	
D	
FIRE PROTECTION	
A	All pay at or more than Lancaster County DB.
B	
C	
ELECTRICAL	
A	One indicated DB was a premium. Other three pay at or above Lancaster County DB.
B	
C	
D	

West Haymarket Joint Public Agency
West Haymarket Civic Arena | Lincoln, Nebraska
General Obligation Facility Bonds, Taxable Series 2010C
(32,035,000 Par amount Recover Zone Economic Development Bonds)

Year	Interest expense	Recovery Zone % subsidy	Build American Bond	Net cost of recover zone	Net cost of build America bonds	Savings
2011	2,246,454.38	(1,010,904.47)	(786,259.03)	1,235,549.91	1,460,195.35	(224,645.44)
2012	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2013	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2014	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2015	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2016	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2017	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2018	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2019	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2020	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2021	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2022	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2023	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2024	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2025	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2026	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2027	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2028	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2029	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2030	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2031	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2032	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2033	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2034	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2035	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2036	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2037	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2038	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2039	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2040	2,162,362.50	(973,063.13)	(756,826.88)	1,189,299.38	1,405,535.63	(216,236.25)
2041	1,833,975.00	(825,288.75)	(641,891.25)	1,008,686.25	1,192,083.75	(183,397.50)
2042	1,494,450.00	(672,502.50)	(523,057.50)	821,947.50	971,392.50	(149,445.00)
2043	1,141,762.50	(513,793.13)	(399,616.88)	627,969.38	742,145.63	(114,176.25)
2044	775,575.00	(349,008.75)	(271,451.25)	426,566.25	504,123.75	(77,557.50)
2045	395,212.50	(177,845.63)	(138,324.38)	217,366.88	256,888.13	(39,521.25)
Total				38,827,768.03	45,887,362.22	(7,059,594.19)
Savings by using recover zone bonds over BAB's						(7,059,594.19)
Net Present Value						($4,034,987.95)

West Haymarket Joint Public Agency
West Haymarket Civic Arena
Lincoln, Nebraska

Mortenson construction

HAMPTON CONSTRUCTION

Schematic Design Estimate
April 5, 2011

Start Date 8/31/2011
Completion Date 9/4/2013

	West Haymarket Arena	Arena Parking
Foundations	$11,527,000	$1,420,000
Structure	$39,102,000	$2,770,000
Exterior Skin & Interior Construction	$34,590,000	$1,560,000
Plumbing, Electrical, Heating Cooling & Elevators	$44,296,000	$1,685,000
Scoreboard, Seating & Other Equipment	$9,735,000	$27,000
Sitework	$630,000	$2,582,000
Total Construction	**$139,880,000**	**$10,044,000**

Project Budget - Lincoln Arena

	Description	I Original Project Budget	II Approved Change Orders	III Project Budget plus Approved Change Orders	IV Proposed Changes from Project Budget	V Current Estimate of Total Project Cost	VI Invoices Approved to Date	VII Amount Left to be Paid
	TOTAL PROJECT SUMMARY							
	Soft Costs							
A.	Design and Engineering	$10,291,612.00	$0.00	$10,291,612.00	$0.00	$10,291,612.00	$1,222,207.05	$9,069,404.95
B.	Testing and Inspections	$900,000.00	$0.00	$900,000.00	$0.00	$900,000.00	$0.00	$900,000.00
C.	FF&E / Preconstruction / Permits / Foodservice	$6,369,794.00	$0.00	$6,369,794.00	$0.00	$6,369,794.00	$62,222.24	$6,307,571.76
D.	Insurance	$214,125.00	$0.00	$214,125.00	$0.00	$214,125.00	$0.00	$214,125.00
E.	Sponsorship Consultant	$1,523,918.00	$0.00	$1,523,918.00	$0.00	$1,523,918.00	$117,616.00	$1,406,302.00
F.	Project Administration	$1,913,500.00	$0.00	$1,913,500.00	$0.00	$1,913,500.00	$0.00	$1,913,500.00
G.	Operations Consulting	$115,141.00	$0.00	$115,141.00	$0.00	$115,141.00	$42,390.18	$72,750.82
	Total Soft Costs	$21,328,090.00	$0.00	$21,328,090.00	$0.00	$21,328,090.00	$1,444,435.47	$19,883,654.53
	Hard Costs							
I.	Arena and Parking / Garage Construction	$149,923,960.00	$0.00	$149,923,960.00	$0.00	$149,923,960.00	$0.00	$0.00
	Total Hard Costs	$149,923,960.00	$0.00	$149,923,960.00	$0.00	$149,923,960.00	$0.00	$149,923,960.00
	Contingency							
J.	Contingency	$6,995,650.00	$0.00	$6,995,650.00	$0.00	$6,995,650.00	$0.00	$0.00
	Total Contingencies	$6,995,650.00	$0.00	$6,995,650.00	$0.00	$6,995,650.00	$0.00	$6,995,650.00
	Total Project Costs	$178,247,700.00	$0.00	$178,247,700.00	$0.00	$178,247,700.00	$1,444,435.47	$176,803,264.53

WH 11-33 Introduce: 5-5-11

RESOLUTION NO. WH- _____

BE IT RESOLVED by the Board of Representatives of the West Haymarket Joint Public Agency:

Jayne Snyder, Chair of the West Haymarket Joint Public Agency Board of Representatives, is hereby authorized to execute all closing documents for the Second Closing between BNSF Railway Company and the West Haymarket Joint Public Agency potentially scheduled for May 10, 2011, including but not limited to:

1. Quitclaim Deed or Easement (as directed by BNSF) to Tract 5 (Parcels 1 and 2) and Tract 6 (Parcels G, H and I) as described in the Title Insurance Commitment.
2. Temporary Access License for Amtrak Work.
3. One or more temporary private at-grade crossings (Crossing Agreements).
4. Assignment and Assumption of existing BNSF Permits.
5. Owner's Certificate and Non-Foreign Status.
6. Owner's Commercial Affidavit and Indemnification that there are no unrecorded leases, easements or claims of easements or parties in possession not shown by Public Records.
7. Title Company Closing Statement.
8. Any other document reasonably required by the Title Company for JPA to complete the Second Closings.

Adopted this _____ day of May, 2011.

Introduced by:

_____

Approved as to Form & Legality:

_____

Legal Counsel for
West Haymarket Joint Public Agency

West Haymarket Joint Public Agency
Board of Representatives

_____

Jayne Snyder, Chair

_____

Tim Clare

_____

Chris Beutler

WH 11-34 Introduce: 5-5-11

RESOLUTION NO. WH- _____

BE IT RESOLVED by the Board of Representatives of the West Haymarket Joint Public Agency:

That the attached Award of Contract to Judds Brothers Construction for the Initial Haymarket Site Preparation Project No. 870703 ($5,120,645.70) and the USPS Parking Lot Reconstruction Project No. 870303 ($519,264.60) for a total cost of $5,639,910.30 is hereby accepted and approved and the Chairperson of the West Haymarket Joint Public Agency Board of Representatives is hereby authorized to execute said Contract on behalf of the JPA.

Adopted this _____ day of May, 2011.

Introduced by:

_____

Approved as to Form & Legality:

_____
Legal Counsel for
West Haymarket Joint Public Agency

West Haymarket Joint Public Agency
Board of Representatives

_____
Jayne Snyder, Chair

_____
Tim Clare

_____
Chris Beutler

ADDENDUM NO. 1

WEST HAYMARKET JOINT PUBLIC AGENCY
HAYMARKET INFRASTRUCTURE IMPROVEMENT
USPS PARKING LOT RECONSTRUCTION
PROJECT NO. 870303
BID NO. 11-080

Addenda are instruments issued by the Purchasing Office prior to the date or time for receipt of offers which will modify or interpret the specifications document by addition, deletion, clarification or correction.

Please acknowledge receipt of this addendum in the space provided in the Attribute Section.

Please be advised of the following changes and clarifications to the City's specification and bidding documents:

1. A Pre-Bid Meeting for this project has been scheduled for Tuesday, April 12, 2011 from 1:00 pm to 3:00 pm. The meeting will be held at the City of Lincoln's Municipal Services Center, 901 West Bond Street, Lincoln, Nebraska. All prospective bidders are encouraged to attend.

Dated this 6th day of April, 2011.

This document was originally issued and sealed by Jon G. Olsen, E-9619, on 4-6-11. This media should not be considered a certified document.

ADDENDUM NO. 2

WEST HAYMARKET JOINT PUBLIC AGENCY
HAYMARKET INFRASTRUCTURE IMPROVEMENT
USPS PARKING LOT RECONSTRUCTION
PROJECT NO. 870303
BID NO. 11-080

Addenda are instruments issued by the Purchasing Office prior to the date or time for receipt of offers which will modify or interpret the specifications document by addition, deletion, clarification or correction.

Please acknowledge receipt of this addendum in the space provided in the Attribute Section.

Please be advised of the following changes and clarifications to the City's specification and bidding documents:

1. The bid form has been updated as follows:

   The following bid item has been added:

01.0100	Pavt & Sidewalk Rem	1,082 CY

Dated this 15th day of April, 2011.

This document was originally issued and sealed by Jon G. Olsen, E-9619, on 4-15-11. This media should not be considered a certified document.

Advertise 1 time
Friday, April 1, 2011

City of Lincoln/Lancaster County
Purchasing Division
NOTICE TO BIDDERS

Sealed bids will be received by the Purchasing Agent of the City of Lincoln/Lancaster County, Nebraska **BY ELECTRONIC BID PROCESS** until: **12:00 pm, Wednesday, April 20, 2011** for the following two bids:

West Haymarket JPA
Initial Haymarket Site Preparation
Project No. 870703
Bid No. 11-079

****

West Haymarket JPA
USPS Parking Lot Reconstruction
Project 870303
Bid No. 11-080

The above two bids are tied together.

Bidders must be registered on the City/County's E-Bid site in order to respond to the above Bid. To Register go to: lincoln.ne.gov (type: e-bid - in search box, then click "Supplier Registration")

Upon e-mail notification of registration approval, you may go to the E-Bid site to respond to this bid. Questions concerning this bid process may be directed to City/County Purchasing at (402) 441-8314 or (402) 441-7410 or *vmejer@lincoln.ne.gov*

City of Lincoln/Lancaster County (Lincoln Purchasing)
Supplier Response

Bid Information

Bid Creator	Deb Winkler Systems Administrator
Email	dwinkler@lincoln.ne.gov
Phone	1 (402) 441-7410
Fax	1 (402) 441-6513
Bid Number	11-080 Addendum 2
Title	West Haymarket JPA USPS Parking Lot Reconstruction Project 870303 (PW/U - Eng. Services)
Bid Type	Bid
Issue Date	04/01/2011
Close Date	4/20/2011 12:00:00 PM CST
Need by Date	

Contact Information

Address	Purchasing\City & County 440 S. 8th St. Lincoln, NE 68508
Contact	Vince M. Mejer
Department	
Building	
Floor/Room	
Telephone	(402) 441-8314
Fax	(402) 441-6513
Email	vmejer@lincoln.ne.gov

Ship to Information

Address	
Contact	
Department	
Building	
Floor/Room	
Telephone	
Fax	
Email	

Supplier Information

Company	Judds Brothers Construction Co.
Address	3835 N 68th Street Lincoln, NE 68505
Contact	
Department	
Building	
Floor/Room	
Telephone	1 (402) 467-4666
Fax	1 (402) 467-4782
Email	
Submitted	4/20/2011 11:26:10 AM CST
Total	$519,264.60

Signature _____

Supplier Notes

Bid Notes

Attached Addendum No. 2 and revised itemized pricing sheet.

This bid is tied with Bid 11-079, Initial Haymarket Site Preparation

If you need assistance in preparing your bid, there are several options.

1) Click the "Help" button in the upper right hand corner of any screen; 2) Contact our office for a training session in Purchasing or assistance over the phone; 3) View the PowerPoint presentation at http://www.lincoln.ne.gov/city/finance/purch/spec/bidinst.ppt

Bid Messages

Please review the following and respond where necessary

#	Name	Note	Response
1	Standard Specifications for Municipal Construction	I acknowledge reading and understanding the current City of Lincoln Standard Specifications for Municipal Construction and Lincoln Standard Plans (including General Provisions and Requirements, and Material and Construction Specifications) View at: http://www.lincoln.ne.gov/city/pworks/engine/dconst/standard/stndspec/index.htm	Yes
2	NDOR Standard Specs for Hwy Construction	I acknowledge reading and understanding the current Nebraska Department of Road's Standard Specifications for Highway Construction Supplemental Specifications to the Standard Specifications for Highway Construction, view at: http://www.dor.state.ne.us/ref-man/	Yes
3	Form of Contract Agreement	I acknowledge reading and understanding the Contract Agreement Forms.	Yes
4	Form of Bonds	I acknowledge that a Performance Bond and a Payment Bond each in the amount of 100% of the Contract amount will be required with the signed contract upon award of this job.	Yes
5	Special Provisions/Traffic Control Provisions	I acknowledge reading and understanding the Special Provisions and/or Traffic Control Provisions.	Yes
6	Instructions to Bidders	I acknowledge reading and understanding the Instructions to Bidders.	Yes
7	Insurance Requirements	I acknowledge reading and understanding the Insurance Requirements.	Yes
8	Specifications	I acknowledge reading and understanding the Specifications.	Yes
9	Plan, Profile & Detail Sheets	I acknowledge reading and understanding the Plan, Profile & Detail Sheets included with this bid.	Yes
10	Tax Exempt Certificate Forms	Materials being purchased in this bid are tax exempt and unit prices are reflected as such. A Purchasing Agent Appointment form and a Exempt Sales Certificate form shall be issued with contract documents. (Note: State Tax Law does not provide for sales tax exemption for proprietary functions for government, thereby Water projects are taxable.)	Yes
11	Bid Bond Submission - City	I acknowledge and understand that my bid will not be considered unless a bid bond or certified check in the sum of five percent (5%) of the total amount of the bid is made payable to the order of the City Treasurer as a guarantee of good faith prior to the bid opening. The bid security may be scanned and attached to the 'Response Attachments' section of your response or faxed to the Purchasing Office (402)441-6513. The original bond/check must then be received in the Purchasing Office, 440 S. 8th Street, Ste. 200, Lincoln, NE 68508 within three (3) days of bid closing. YOU MUST INDICATE YOUR METHOD OF BID BOND	I have scanned and attached my bid bond.

		SUBMISSION IN BOX TO RIGHT!	
12	Electronic Signature	Please check here for your electronic signature.	Yes
13	Contact	Name of person submitting this bid:	John R. Judds
14	Unit Pricing Rules	I acknowledge the Excel spreadsheet is attached to this bid in the Response Attachment Section. The unit price of the Excel Spreadsheet takes precedence over the total submitted in Line Items.	Yes
15	Project Dates	The Contractor agrees that the Work in this Contract shall begin as soon after the Notice to Proceed as is necessary for the Contractor to complete the Work within the number of calendar days allowed and prior to the stated completion date. The completion date shall be October 21, 2011.	YES
16	Employee Class Act EO	I acknowledge reading and understanding the Employee Classification Act, Executive Order 83319.	Yes
17	Employee Class Act Affidavit	I acknowledge if awarded the contract I will abide by the law, notorize and attach the Employee Classification Act Affidavit to my contract.	Yes
18	DBW	I acknowledge reading and understanding the Davis Bacon Wage Rates.	Yes
19	Agreement to Addendum No. 1	Respondent hereby certifies that the change set forth in this addendum has been incorporated in their proposal and is part of their bid. Reason: Attached Addendum No. 1.	Yes
20	Agreement to Addendum No. 2	Respondent hereby certifies that the change set forth in this addendum has been incorporated in their proposal and is part of their bid. Reason: Attached Addendum No. 2 and revised itemized pricing sheet.	Yes

Line Items

#	Qty	UOM	Description	Response
1	1	Lump Sum	USPS Parking Lot Reconstruction Project 870303 - Total Lump Sum of Bid	$519,264.60

Item Notes: Fill out the itemized Excel spreadsheet attached below. Attach completed spreadsheet on the 'Response Attachments' of your response.

Supplier Notes:

Response Total: $519,264.60

11-080

JUDDS BROTHERS CONSTRUCTION COMPANY

Line No.	Pay Item No.	Description	Quantity	Unit	Unit Price	Amount
01	00.2000	Const Staking	1.0000	LS	$7,400.00	$7,400.00
02	00.4000	Mobilization	1.0000	LS	$55,000.00	$55,000.00
03	01.0100	Pavt & Sidewalk Rem	1,082.0000	CY	$13.50	$14,607.00
04	01.0170	Adj MH to Grade, Cmpl	3.0000	EA	$290.00	$870.00
05	01.0180	Adj Water Valve Box To Grade, Cmpl	5.0000	EA	$165.00	$825.00
06	01.0210	Sawing, Type "A"	205.0000	LF	$8.00	$1,640.00
07	01.0230	Sawing, Type "C"	95.0000	LF	$11.00	$1,045.00
08	02.0010	Gen Clearing & Grubbing	1.0000	LS	$8,000.00	$8,000.00
09	02.0090	Rem & Replace Fence	40.0000	LF	$100.00	$4,000.00
10	02.0120	Parking Space Finish	2,517.0000	SY	$4.00	$10,068.00
11	02.0301	Excavation	292.0000	CY	$5.00	$1,460.00
12	02.0302	Excavation - Borrow	525.0000	CY	$10.00	$5,250.00
13	02.0601	Earthwork Measured in Embankment	817.0000	CY	$1.40	$1,143.80
14	03.0060	PCC Pavt w/Int Curb, 9"	840.0000	SY	$55.00	$46,200.00
15	03.0070	PCC Pavt w/Int Curb, 8"	2,555.0000	SY	$45.00	$114,975.00
16	06.0020	Combined Curb & Gutter	29.0000	LF	$20.00	$580.00
17	06.0060	Conc Median Surfacing, 4"	382.0000	SF	$4.00	$1,528.00
18	07.0020	Conc Sidewalk, 4"	10,842.0000	SF	$3.75	$40,657.50
19	07.0045	Conc Bikeway, 5"	425.0000	SF	$4.00	$1,700.00
20	07.0100	Detectable Warning Panels	60.0000	SF	$40.00	$2,400.00
21	10.0010	Crushed Rock Surfacing (In Place)	200.0000	Ton	$30.00	$6,000.00
22	13.0270	Paint Mkg, 4" Y	1,340.0000	LF	$0.50	$670.00
23	13.0275	Paint Mkg, 4" W	113.0000	LF	$0.50	$56.50
24	13.0530	Rem Paint Mkg, 4"	531.0000	LF	$1.00	$531.00
25	14.0001	Traffic Sign, < 4 Sq Ft	3.0000	EA	$110.00	$330.00
26	14.0003	Traffic Sign, 4 Sq Ft < 9 Sq Ft	4.0000	EA	$130.00	$520.00
27	14.0007	"U" Channel Sign Posts	129.0000	LF	$8.00	$1,032.00
28	14.0013	Remove Traffic Sign Only	6.0000	EA	$60.00	$360.00
29	14.0015	Remove Traffic Sign and Post	9.0000	EA	$80.00	$720.00
30	14.0201	Rel Sign and Post	2.0000	EA	$55.00	$110.00
31	15.0001	Traffic Ctrl for Const	1.0000	LS	$17,000.00	$17,000.00
32	21.0090	RCP Storm Sewer, Cl III, 24"	84.0000	LF	$65.00	$5,460.00
33	21.0100	RCP Storm Sewer, Cl III, 18"	105.0000	LF	$47.50	$4,987.50
34	21.0110	RCP Storm Sewer, Cl III, 15"	102.0000	LF	$43.00	$4,386.00

35	21.0770	Storm Sewer Inlet (Cmpl), 72"	2.0000	EA	$2,700.00	$5,400.00
36	21.[illegible]0	Canted Storm Sewer Inlet (Cmpl), 72"	1.0000	EA	$2,750.00	$2,7[illegible]0
37	21.0820	Grate Inlet, Ty "F-1" (Cmpl)	1.0000	EA	$2,200.00	$2,200.00
38	21.0895	Storm Sewer MH, 15"-30" (Cmpl)	3.0000	EA	$3,500.00	$10,500.00
39	21.0940	Conc for Collars, Elbows & Hdwls (In Place)	0.9000	CY	$1,600.00	$1,440.00
40	21.0950	Reinf Steel for Collars, Elbows & Hdwls (In Place)	66.0000	LBS	$1.00	$66.00
41	21.1050	Tap Ex Storm Sewer MH & Replace	1.0000	EA	$800.00	$800.00
42	21.1320	Rem Storm Sewer Pipe, 15"	62.0000	LF	$30.00	$1,860.00
43	21.1325	Rem Storm Sewer Pipe, 12"	16.0000	LF	$30.00	$480.00
44	21.1710	Rem Ex Inlet (Cmpl)	1.0000	EA	$450.00	$450.00
45	21.1740	Rem Ex Grate Inlet (Cmpl)	2.0000	EA	$450.00	$900.00
46	24.0102	SL, Rem, Cmpl	2.0000	EA	$1,000.00	$2,000.00
47	24.0104	Found, Rem SL Pole	3.0000	EA	$600.00	$1,800.00
48	24.0105	PB, Rem	1.0000	EA	$450.00	$450.00
49	24.0223	Pole, Rel SL, Cmpl (req found)	3.0000	EA	$1,100.00	$3,300.00
50	24.0806	PB-T6	6.0000	EA	$350.00	$2,100.00
51	24.0894	Conduit, 1 1/2" B	167.0000	LF	$11.00	$1,837.00
52	24.0897	Conduit, 4" B	1,524.0000	LF	$13.00	$19,812.00
53	24.0903	Conduit, 1 1/2" T	539.0000	LF	$4.50	$2,425.50
54	24.1050	Cable, Tracer Wire	1,524.0000	LF	$0.50	$762.00
55	24.1063	Cable, No 4 CG	85.0000	LF	$2.75	$233.75
56	24.1064	Cable, No 6 CG	545.0000	LF	$2.60	$1,417.00
57	24.1065	Cable, No 8 CG	646.0000	LF	$2.20	$1,421.20
58	24.1071	Cable, No 2 SL	170.0000	LF	$2.90	$493.00
59	24.1072	Cable, No 4 SL	1,090.0000	LF	$2.75	$2,997.50
60	24.1073	Cable, No 6 SL	1,292.0000	LF	$2.60	$3,359.20
61	24.1514	Luminaire, Inst 400W HPSV-SC	5.0000	EA	$530.00	$2,650.00
62	30.0050	Seeding, Ty "B"	0.5200	AC	$3,200.00	$1,664.00
63	32.0040	Synthetic Fabric Silt Fence Inst	214.0000	LF	$2.25	$481.50
64	32.0050	Synthetic Fabric Silt Fence Maint	428.0000	LF	$0.30	$128.40
65	32.0070	Inst Storm Drain Inlet Protection	6.0000	EA	$90.00	$540.00
66	32.0080	Storm Drain Inlet Protetion Maint	12.0000	EA	$30.00	$360.00
67	32.0090	Rem Storm Drain Inlet Protection	6.0000	EA	$5.50	$33.00
68	50.0001	Parking Meter Post	1.0000	EA	$300.00	$300.00
69	50.0001	Remove Post	3.0000	EA	$55.00	$165.00
70	50.0001	Handicap Parking Pavement Marking	3.0000	EA	$190.00	$570.00
71	50.0001	Area Drain	2.0000	EA	$880.00	$1,760.00
72	50.0001	Remove Storm Drain (Existing Strip Drains)	3.0000	EA	$270.00	$810.00
73	50.0001	Furnish Dewatering Container	1.0000	EA	$4,300.00	$4,300.00
74	50.0001	Fiber Vault (30" x 48" x 36")	3.0000	EA	$2,100.00	$6,300.00
75	50.0001	Lighting Unit, Type "A"	1.0000	EA	$3,200.00	$3,200.00
76	50.0001	Lighting Unit, Type "B"	1.0000	EA	$3,700.00	$3,700.00
77	50.0001	Remove Wall Pack	2.0000	EA	$180.00	$360.00

78	50.0001	Re-Wire Multitap Ballast	4.0000	EA	$180.00	$720.00
79	50.0001	Remove/Replace Existing Shoebox Fixture	4.0000	EA	$700.00	$2,800.00
80	50.0005	Conduit/Circuit in USPS Building	80.0000	LF	$24.00	$1,920.00
81	50.0005	Remove Retaining Wall	217.0000	LF	$25.00	$5,425.00
82	50.0005	42" Pedestrian Pipe Railing	85.0000	LF	$120.00	$10,200.00
83	50.0005	Temporary Chain Link Fence	323.0000	LF	$2.75	$888.25
84	50.0005	PVC Storm Sewer, 12"	117.0000	LF	$40.00	$4,680.00
85	50.0005	Dewatering for Storm Sewers	100.0000	LF	$13.00	$1,300.00
86	50.0015	Electrical Lighting Circuit Addition	1.0000	LS	$500.00	$500.00
87	50.0020	Covercrop Seeding	0.5200	AC	$850.00	$442.00
88	50.0040	Temporary Surfacing	219.0000	SY	$55.00	$12,045.00
89	50.0045	Remove and Salvage Brick Pavers	276.0000	SF	$6.50	$1,794.00
90	50.0045	5" Reinforced Concrete Sidewalk	476.0000	SF	$4.50	$2,142.00
91	50.0045	8" Concrete Driveway	2,192.0000	SF	$5.00	$10,960.00
92	50.0050	Construction Staking for Utilities	12.0000	HRS	$130.00	$1,560.00
93	50.0060	Dewatering Container Usage	30.0000	CDAY	$60.00	$1,800.00
						$519,264.60

WEST HAYMARKET JOINT PUBLIC AGENCY(JPA)

USPS PARKING LOT RECONSTRUCTION
11-080
PROJECT 870303

CONTRACT AGREEMENT

THIS CONTRACT, made and entered into this 25 day of APRIL, 2011 by and

between JUDDS BROTHERS CONSTRUCTION CO.

hereinafter called the Contractor and the WEST HAYMARKET JOINT PUBLIC AGENCY, a **municipal corporation**, hereinafter called JPA.

WITNESS, that:

WHEREAS, JPA has caused to be prepared, in accordance with law, Specifications, Plans, and other Contract Documents for the Work herein described, and has approved and adopted said documents and has caused to be published an advertisement for and in connection with said Work, to wit:

USPS PARKING LOT RECONSTRUCTION PROJECT 870303 ; and

WHEREAS, the Contractor, in response to such advertisement, has submitted to the JPA, in the manner and at the time specified, a sealed Proposal in accordance with the terms of said advertisement; and,

WHEREAS, JPA, in the manner prescribed by law, has publicly advertised, opened, examined, and canvassed the Proposals submitted in response to such advertisement, and as a result of such canvass has determined and declared the Contractor to be the lowest and best bidder for the said Work for the sum or sums named in the Contractor's Proposal, a copy thereof being attached to and made a part of this Contract.

NOW, THEREFORE, in consideration of the sums to be paid to the Contractor and the agreements herein contained, the Contractor and JPA have agreed and hereby agree as follows:

CONTRACT AGREEMENT

The Contractor agrees to (a) furnish all tools, equipment, supplies, superintendence, transportation, and other construction accessories, services, and facilities; (b) furnish all materials, supplies, and equipment specified to be incorporated into and form a permanent part of the complete Work; (c) provide and perform all necessary labor in a substantial and workmanlike manner and in accordance with the provisions of the Contract Documents; and (d) execute, construct, and complete all Work included in and covered by JPA's official award of this Contract to the Contractor, such award being based on the acceptance by JPA of the Contractor's Proposal, or part thereto, as follows:

ALL OF THE PROPOSAL SUBMITTED BY JUDDS BROTHERS CONSTRUCTION CO IN CONNECTION WITH THE WEST HAYMARKET JPA USPS PARKING LOT RECONSTRUCTION PROJECT 870303 DATED APRIL 20, 2011

JPA agrees to pay to the Contractor for the performance of the work embraced in this Contract, and the Contractor agrees to accept as full compensation therefore, the sums and prices for all Work covered by and included in the Contract award and designated above, payment thereof to be made in the manner provided in the General Provisions and Requirements.

COMPLETION DATE – The Contractor agrees that the Work in this Contract shall begin as soon after the Notice to Proceed as is necessary for the Contractor to complete the Work within the number of calendar days allowed and prior to the stated completion date. The completion date shall be no later than OCTOBER 21, 2011 .

GUARANTEE – The guarantee periods as stated in Section IX, Paragraph A of the City of Lincoln Standard Specifications for Municipal Construction shall not be applicable to this project.

CONTRACT DOCUMENTS – The Contract Documents comprise the Contract, and consist of the following:

1. City of Lincoln Standard Specifications for Municipal Construction (2006 Edition)
2. Proposal Forms
3. Contract Agreement Forms
4. Commentary to Accompany Construction Bonds
5. Construction Performance Bond
6. Construction Payment Bond
7. Special Provisions
8. Lincoln Standard Plans 2010
9. Standard Specifications for Highway Construction Nebraska Department of Roads (2007 Edition)
10. Plan and Profile Detail Sheets
11. Any executed Addenda or Change Orders
12. Any portion of this project used for **providing water service**, such as pipe for water mains, **are not tax exempt and are subject to sales and use tax**.
13. The **remainder** of this project, including items exclusively used for providing fire protection, such as fire hydrants, **are exempt from sales and use taxes**.
14. Sales tax exempt forms will be provided upon award of bid.

CONTRACT AGREEMENT

These Contract Agreements, together with the other Contract Documents herein above mentioned, form this Contract, and they are as fully a part of the Contract as if hereto attached or herein repeated.

The Contractor and JPA hereby agree that all the terms and conditions of this Contract shall, by these presents, be binding upon themselves, and their heirs, administrators, executors, legal and personal representatives, successors, and assigns.

IN WITNESS WHEREOF, the Contractor and JPA do hereby execute this Contract.

EXECUTION BY JPA

ATTEST:

BY: _____

(Seal) JPA CHAIR

JPA

Dated: _____

JOINT PUBLIC AGENCY

EXECUTION BY CONTRACTOR

IF A CORPORATION

_____
(Name of Corporation)

ATTEST:

_____
(Address)

_____ (Seal)

By: _____
(Duly Authorized Official)

_____
(Legal Title of Official)

IF OTHER TYPE ORGANIZATION

_____
(Name and Type of Organization)

_____
(Address)

_____
(Member)

_____
(Member)

_____
(Member)

IF AN INDIVIDUAL

By: _____
(Name)

_____

Commentary to Accompany Construction Bonds

A. GENERAL INFORMATION

There are two types of construction bonds that are required by statutes for public work in many jurisdictions and are widely used for other projects as well.

- Construction Performance Bond
- Construction Payment Bond

The Construction Performance Bond is an instrument that is used to assure the availability of funds to complete the construction.

The Construction Payment Bond is an instrument that is used to assure the availability of sufficient funds to pay for labor, materials and equipment used in the construction. For public work the Construction Payment Bond provides rights of recovery for workers and suppliers similar to their rights under the mechanics lien laws applying to private work.

The objective underlying the rewriting of construction bond forms was to make them more understandable and to provide guidance to users. The intention was to define the rights and responsibilities of the parties, without changing the traditional rights and responsibilities that have been decided by the courts. The new bond forms provide helpful guidance regarding time periods for various notices and actions and clarify the extent of available remedies.

The concept of a pre-default meeting has been incorporated into the Construction Performance Bond. All of the participants favored early and informal resolution of the problems that may precipitate a default, but some Surety companies were reluctant to participate in pre-default meetings absent specific authorization in the bond form.

The responsibilities of the Owner and the options available to the Surety when a default occurs are set forth in the Construction Performance Bond. Procedures for making a claim under the Construction Payment Bond are set forth in the form.

EJCDC recommends the use of two separate bonds rather than a combined form. Normally the amount of each bond is 100 percent of the contract amount. The bonds have different purposes and are separate and distinct obligations of the Surety. The Surety Association reports that the usual practice is to charge a single premium for both bonds, and there is no reduction in premium for using a combined form or for issuing one bond without the other.

B. COMPLETING THE FORMS

Bonds have important legal consequences; consultation with an attorney and a bond specialist is encouraged with respect to federal, state, and local laws applicable to bonds and with respect to completing or modifying the bond forms.

Both bond forms have a similar format and the information to be filled in is ordinarily the same on both bonds. If modification is necessary, the modifications may be different.

The bond forms are prepared for execution by the Contractor and the Surety. Evidence of authority to bind the Surety is usually provided in the form of a power of attorney designating the agent who is authorized to sign on behalf of the Surety. The power of attorney should be filed with the signed bonds.

Each bond must be executed separately since they cover separate and distinct obligations.

Preferably the bond date should be the same date as the contract, but in no case should the bond date precede the date of contract.

Project Name: Project No.:

Bond No.: _____

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, The City of Lincoln, Nebraska ("The City") has awarded to _____ _____ as Principal a contract dated the _____ day of _____, 20____, (the "Contract"), which Contract is by this reference made a part hereof, for the work described as follows:

AND WHEREAS, Principal is required to furnish a bond in connection with the Contract, guaranteeing the faithful performance thereof;

NOW, THEREFORE, we, the undersigned Principal and _____, as Surety, are held and firmly bound unto The City in the sum of _____ dollars ($_____), to be paid to The City or its successory and assigns; for which payment, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its heirs, executors, administrators, successors, or assigns approved by The City, shall promptly and faithfully perform the covenants, conditions, and agreements of the Contract during the original term and any extensions thereof as may be granted by The City, with or without notice to Surety, and during the period of any guarantees or warranties required under the Contract, and shall also promptly and faithfully perform all the covenants, conditions, and agreements of any alteration of the Contract made as therein provided, notice of which alterations to Surety being hereby waived, on Principal's part to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify, defend, protect, and hold harmless The City as stipulated in the Contract, then this obligation shall become and be null and void; otherwise it shall be and remain in full force and effect.

No extension of time, change, alteration, modification, or addition to the Contract, or of the work required thereunder, shall release or exonerate Surety on this bond or in any way affect the obligation of this bond; and Surety does hereby waive notice of any such extension of time, change, alteration, modification, or addition.

Whenever Principal shall be and declared by The City to be in default under the Contract, Surety shall promptly remedy the default, or shall promptly:

1. Undertake through its agents or independent contractors, reasonably acceptable to The City, to complete the Contract in accordance with its terms and conditions and to pay and perform all obligations of Principal under the Contract, including without limitation, all obligations with respect to warranties, guarantees, and the payment of liquidated damages, or, at Surety's election, or, if required by The City,

Project Name: Project No.:

2. Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and, upon determination by The City of the lowest responsible bidder, arrange for a contract between such bidder and The City and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Sum, and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees, and the payment of liquidated damages; but, in any event, Surety's total obligations hereunder shall not exceed the amount set forth in the third paragraph hereof. The term "balance of the Contract Sum," as used in this paragraph, shall mean the total amount payable by The City to the Principal under the Contract and any amendments thereto, less the amount paid by The City to Principal.

Surety's obligations hereunder are independent of the obligations of any other surety for the performance of the Contract, and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing The City's rights against the others.

No right of action shall accrue on this bond to or for the use of any person or corporation other than The City or its successors or assigns.

Surety may join in any arbitration proceedings brought under the Contract and shall be bound by any arbitration award.

In the event suit is brought upon this bond by The City, Surety shall pay reasonable attorney's fees and costs incurred by The City in such suit.

Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.

IN WITNESS WHEREOF, we have hereunto set our hands this _____ day of _____, 20__.

Principal: _____
(Name of Firm)

By: _____
(Signature)

_____
(Printed Name)

Title: _____

Surety: _____
(Name of Firm)

By: _____
(Signature)

_____
(Printed Name)

Title: _____

Address for Notices:

_____

_____

_____

NOTE: Notary acknowledgment for Surety and Surety's Power of Attorney must be attached.

Project Name: Project No.:

Bond No.: _____

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, The City of Lincoln, Nebraska ("The City") has awarded to _____ _____ as Principal a contract dated the _____ day of _____, 20____, (the "Contract") for the work described as follows:

AND WHEREAS, Principal is required to furnish a bond in connection with the Contract to secure the payment of claims of laborers, mechanics, material suppliers, and other persons as provided by law;

NOW, THEREFORE, we, the undersigned Principal and _____, as Surety, are held and firmly bound unto The City in the sum of _____ dollars ($_____), for which payment well and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its heirs, executors, administrators, successors, or assigns approved by The City, or its subcontractors shall fail to pay any of the persons named in the City Charter or state statutes, or amounts due with respect to work or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over to the State of Nebraska from the wages of employees of Principal and subcontractors with respect to such work and labor, that Surety will pay for the same in an amount not exceeding the sum specified in this bond, otherwise the above obligation shall become and be null and void.

Surety, for value received, hereby expressly agrees that no extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder, shall in any way affect the obligation of this bond; and it does hereby waive notice of any such extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder.

Surety's obligations hereunder are independent of the obligations of any other surety for the payment of claims of laborers, mechanics, material suppliers, and other persons in connection with the Contract; and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing The City's rights against the other.

Project Name: Project No.:

In the event suit is brought upon this bond, the parties not prevailing in such suit shall pay reasonable attorneys' fees and costs incurred by the prevailing parties in such suit.

Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.

IN WITNESS WHEREOF, we have hereunto set our hands this _____ day of _____, 20___.

Principal: _____
(Name of Firm)

By: _____
(Signature)

_____
(Printed Name)

Title: _____

Surety: _____
(Name of Firm)

By: _____
(Signature)

_____
(Printed Name)

Title: _____

Address for Notices:

_____

_____

_____

NOTE: Notary acknowledgment for Surety and Surety's Power of Attorney must be attached.

EMPLOYEE CLASSIFICATION ACT AFFIDAVIT

For the purposes of complying with THE NEBRASKA EMPLOYEE CLASSIFICATION ACT, I, _____, herein below known as the Contractor, state under oath and swear as follows:

1. Each individual performing services for the Contractor is properly classified under the Employee Classification Act.

2.The Contractor has completed a federal I-9 immigration form and has such form on file for each employee performing services.

3. The Contractor has complied with Neb Rev Stat 4-114.

4. The Contractor has no reasonable basis to believe that any individual performing services for the Contractor is an undocumented worker.

5. The Contractor is not barred from contracting with the state or any political subdivision pursuant to section 12 of this Act.

6. As the Contractor I understand that pursuant to the Employee Classification Act a violation of the Act by a contractor is grounds for rescission of the contract by the City. I understand that pursuant to the Act any contractor who knowingly provides a false affidavit may be subject to criminal penalties and upon a second or subsequent violation shall be barred from contracting with the City for a period of three years after the date of discovery of the falsehood.

I hereby affirm and swear that the statements and information provided on this affidavit are true, complete and accurate. The undersigned person does hereby agree and represent that he or she is legally capable to sign this affidavit and to lawfully bind the Contractor to this affidavit.

PRINT NAME: _____
(First, Middle, Last)

SIGNATURE: _____

TITLE: _____

State of Nebraska)
) ss.
County of _____)

This affidavit was signed and sworn to before me, the undersigned Notary Public, on this ____ day of _____, 20__.

_____
Notary Public

General Decision Number: NE100002 10/29/2010 NE2

Superseded General Decision Number: NE20080002

State: Nebraska

Construction Types: Heavy and Highway

Counties: Adams, Antelope, Arthur, Banner, Blaine, Boone, Box Butte, Boyd, Brown, Buffalo, Burt, Butler, Cedar, Chase, Cherry, Cheyenne, Clay, Colfax, Cuming, Custer, Dakota, Dawes, Dawson, Deuel, Dixon, Dodge, Dundy, Fillmore, Franklin, Frontier, Furnas, Gage, Garden, Garfield, Gosper, Grant, Greeley, Hall, Hamilton, Harlan, Hayes, Hitchcock, Holt, Hooker, Howard, Jefferson, Johnson, Kearney, Keith, Keya Paha, Kimball, Knox, Lancaster, Lincoln, Logan, Loup, Madison, McPherson, Merrick, Morrill, Nance, Nemaha, Nuckolls, Otoe, Pawnee, Perkins, Phelps, Pierce, Platte, Polk, Red Willow, Richardson, Rock, Saline, Scotts Bluff, Seward, Sheridan, Sherman, Sioux, Stanton, Thayer, Thomas, Thurston, Valley, Wayne, Webster, Wheeler and York Counties in Nebraska.

HEAVY CONSTRUCTION PROJECTS (does not include water well drilling); HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects, and railroad construction; bascule, suspension & spandrel arch bridges; bridges designed for commercial navigation; bridges involving marine construction; other major bridges).

I .fication Number	Publication Date
0	03/12/2010
1	10/29/2010

SUNE1999-001 06/16/1999

	Rates	Fringes
CARPENTER	$ 13.30	
CEMENT FINISHER	$ 12.50	
ELECTRICIAN	$ 11.90	
Flagger	$ 7.60	
Form Setter	$ 10.80	
LABORER	$ 8.30	
MANHOLE BUILDER	$ 10.20	
MECHANIC	$ 12.95	
PAINTER	$ 8.35	
Pile driver lead person	$ 8.35	
F r equipment operators:		
All purpose spreader	$ 9.50	
Asphalt distributor	$ 9.65	
Asphalt paving machine (screed)	$ 10.45	

Asphalt paving machine.....$ 12.35
Asphalt roller, self-
propelled.....$ 11.20
Backhoe excavator (track
type).....$ 12.55
Bulldozer or push tractors:
115 drawbar h.p. and over..$ 12.80
Less than 115 drawbar h.p..$ 11.60
Clamshell, dragline,
crane, pile driver/shovel...$ 13.60
Concrete cure machine.....$ 9.20
Concrete finishing machine
or slip form paver.....$ 12.80
Concrete saw operator.....$ 11.20
Concrete texture machine....$ 9.20
Crusher (including those
with integral screening
plant).....$ 11.75
Dredge pump.....$ 9.50
Front end loaders:
4 cu. yds. or less.....$ 11.40
Over 4 cu. yds.....$ 12.10
Hydrohammer.....$ 9.60
Loader/backhoe (rubber-
tired).....$ 9.85
Material stockpiler.....$ 10.20
Motor grader (finisher).....$ 13.15
Motor grader (rough).....$ 10.90
Power broom operator.....$ 9.15
Power grader machine
(trimmer & profiler).....$ 12.80
Roller or compactor,
earthwork, self-
propelled.....$ 10.05
Scraper.....$ 12.40
Skid steer loader.....$ 9.50
Stationary plant (asphalt
or concrete).....$ 12.75
Stationary plant (base or
stabili- zation).....$ 11.75
Tractor (farm type).....$ 9.50
Traveling plant
stabilization.....$ 11.60
Trenching machine.....$ 9.85
Water tankers:
6000 gallons and over.....$ 11.20
Under 6000 gallons.....$ 9.65

Truck drivers:
Semi-trailer or lowboy.....$ 10.85
Single axle.....$ 8.40
Tandem axle.....$ 9.65
Transit mix.....$ 9.65

WELDER.....$ 12.25

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.
= ==========

Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses

(29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

In regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

WEST HAYMARKET JOINT PUBLIC AGENCY (2011)
HAYMARKET INFRASTRUCTURE IMPROVEMENTS
USPS PARKING LOT RECONSTRUCTION
PROJECT NO. 870303

PROFESSIONAL CIVIL ENGINEER
JON G.
OLSEN
E-9619
3/31/11
STATE OF NEBRASKA

GENERAL CONTRACT REQUIREMENTS

The work as detailed on the plans shall be completed in accordance with the requirements of the 2006 City of Lincoln Standard Specifications for Municipal Construction, as supplemented by the Nebraska Department of Road's 2007 Standard Specifications for Highway Construction. The 2006 City of Lincoln Standard Specifications for Municipal Construction and the Nebraska Department of Road's 2007 Standard Specifications for Highway Construction (NDOR Standard Specifications), including all amendments, Supplemental Specifications and additions thereto effective at the date of the contract, the Special Provisions, plans, and all supplementary documents are essential parts of the contract. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete project

In case of a discrepancy:

1. Special Provisions shall govern over the City of Lincoln Standard Specification for Municipal Construction.
2. The Special Provisions shall govern over the Plans.

The Contractor shall not take advantage of any apparent error or omission in the plans or specifications. Upon discovery of such an error or omission, the Contractor shall notify the Engineer immediately. The Engineer will then make such corrections or interpretations as necessary to fulfill the intent of the plans and specifications.

Materials or work described in words which, so applied, have known technical or trade meaning shall be held to refer to such recognized standards.

Figured dimensions on the plans shall be taken as correct but shall be checked by the Contractor before starting construction. Any errors, omissions, or discrepancies shall be brought to the attention of the Engineer and the Engineer's decision thereon shall be final. Correction of errors or omissions on the drawings or specifications may be made by the Engineer when such correction is necessary for the proper execution of the work

Any reference the City, or OWNER, in the City of Lincoln Standard Specifications for Municipal Construction, shall be considered reference to the West Haymarket Joint Public Agency (JPA), its employees, or representatives hired by the JPA as a consultant for construction project management, observation or testing services. The JPA's address is 555 South 10th Street, Lincoln, Nebraska 68528.

JPA: JPA shall mean the West Haymarket Joint Public Agency, a joint administrative entity under the Interlocal Cooperation Act, comprised of the City of Lincoln and the University of Nebraska – Lincoln for the purpose of implementing and overseeing the operation of the West Haymarket arena and infrastructure improvement projects.

PROJECT TIES

This project is tied to the following project.

JPA Project Number	Description
870703	West Haymarket Joint Public Agency (2011) Initial Haymarket Site Preparation Project

This project and the above referenced JPA Project(s) will be advertised for bids on the same date. Bids for this project and all projects listed above will be received and opened on the same day as shown on the invitation to bid for the projects.

In order to be eligible for award of this contract, bidders shall submit a completed bidding proposal for this job and all jobs listed.

Award of Contract, if awarded, will be made on the combined bid for all contracts. Separate contracts will be awarded for each project.

The bid amount for Mobilization cannot exceed ten percent of the total bid amount for the individual contract in which it is bid.

BONDING PERIOD

The City of Lincoln Standard Specifications, General Provisions and Requirements has been amended as follows:

Award and Execution of Contract.

B. Construction Performance and Construction Payment Bonds and Execution of Contract.

Within **five (5) days** after the acceptance of the bid, the successful Bidder must execute a written Contract between the Bidder and the City, said Contract will incorporate the City's Contract Documents and be on forms provided by the City, Construction Performance and Construction Payment Bonds, in a sum not less than the contract price, executed by the Bidder and by a corporate surety company authorized to transact business in the State of Nebraska.

SUBSTANTIAL AND FINAL COMPLETION

Substantial completion shall mean the completion of all work associated with the parking lot and sidewalk construction, utility work, storm sewer construction, pavement construction along "R" Street, parking lot and street lighting, striping/signing at parking lots, and pavement markings/signing. Substantial completion for this contract shall be on or before September 2, 2011.

Final completion of all work including seeding, sodding, site clean-up, and all other incidental work required to provide a complete and functional project shall be completed by October 21,

2011. Determination of Substantial Completion and Final Completion shall be subject to Engineer's approval.

Notice to Proceed with work on this project is anticipated to be given to the Contractor on or before May 31, 2011. It is imperative that the Contractor is ready to begin work as soon as possible upon receipt of the notice to proceed so as not to delay work associated with the initial site preparation grading work for the arena project.

STATUS OF RIGHT-OF-WAY

All work to be completed shall be performed in existing public right-of-way or on USPS property or private properties where a right-of-entry or temporary construction easement will be obtained. The JPA is currently negotiating with the adjacent property owners to acquire the additional right-of-way and easements to construct the project. The status of the unacquired right-of-way tracts is estimated as follows.

TRACT NO.	CONTRACT APPROVAL DATE	HEARING DATE	IMPROVEMENTS REMAINING THIS DATE	ANTICIPATED ACQUISTION DATE	ESTIMATED RELOCATION DATE
1	Right-of-entry Obtained		NA	NA	NA
2	Negotiating		NA	5-31-11	NA

The Contractor will not be allowed to perform work outside the existing public right-of-way on any tract listed above until legal and physical possession has been acquired by the City or a right-of-entry has been acquired by the City that will allow the Contractor to work on the property. If necessary, the Contractor will be granted an extension of time for completion of work on the project if it is substantiated by the Contractor that a delay in the completion of the work is caused because of the above tract(s) not being acquired by the anticipated acquisition date.

STATUS OF UTILITIES

The following information is current as of March 25, 2010. The Contractor should request a utility status update at the project pre-construction conference, and/or prior to starting work. The Contractor shall coordinate all construction activities with affected utilities that have identified relocations which are to be completed concurrent with the project.

Utilities known to have facilities in the project area:

Private Utilities

The following utilities are known to exist within the Project limits, and may need to be relocated as a result of the Project. The Contractor shall take into consideration the associated durations of utility relocations, and these associated durations should be considered in the baseline schedule, and prosecution of the Work. The Contractor shall conduct ongoing coordination meetings with all utility owners to facilitate these relocations.

Black Hills Energy

Black Hills Energy may be required to loop the existing gas service to the USPS to accommodate construction of the project. The Contractor shall coordinate their work with Black Hills Energy to allow this work to be completed concurrently with construction of the project.

The point of contact for Black Hills Energy is:

Contact: Randy Kreifels
Phone: (402) 437-1715

Lincoln Electric System (LES)

LES will be installing new conduits along "R" Street through the limits of the project concurrently with the work following removal of the pavement and sidewalks. The Contractor shall coordinate their work with LES to allow them to complete the installation of the new conduits prior to construction of new pavement, sidewalks or other utilities as necessary.

The point of contact for LES is:

Contact: Steve Wallingford
Phone: (402) 467-7680

United States Postal Service (USPS)

The USPS has existing water service and fire service lines that provide water to the building. These lines may need to be relocated or looped as a result of the work on this project or as directed by the Engineer as part of the construction work for the project. The Contractor shall coordinate all disruptions in utility service to the USPS with the local postmaster or his designated representative.

UTILITIES

Add the following paragraphs to Article II, Section A (EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS, AND SITE OF WORK):

The Contractor shall notify the Digger's Hotline of Nebraska (HOTLINE), Phone Number 1-800-331-5666, at least 48 hours in advance of the commencement of work at any site to allow the member utilities to examine the construction site and mark the location of the utilities' respective facilities.

The Contractor acknowledges that some (or all) of the utility companies, with facilities shown on the drawings may not be members of the Hotline and, therefore, not automatically contacted by the above-referenced telephone number. The Contractor shall be responsible for making itself aware of utility company facilities not reported by the Hotline, and shall be liable for any and all damages stemming from repair or delay costs or any other expenses resulting from the unanticipated discovery of underground utilities. The Contractor shall also be responsible for verifying that each utility has responded to such notification

PERMITS AND LICENSES

Add the following to Article VI, Section M. (PERMITS AND LICENSES):

The Owner will provide the following permits:

1) NPDES Permit

The Contractor shall be responsible for complying with the requirements of all permits acquired by the City.

The Contractor shall acquire all permits required by Laws or Regulations, including, without limitation, the following specific permits (if applicable):

1) Certificates and permits are required for uses such as, but not limited to:
   a) Fuel burning equipment
   b) Gasoline and petroleum distillate storage containers
   c) Land disturbing activities
   d) Odors
2) All associated building demolition permits
3) City, State, and County Transportation Encroachment permits
4) Permit-Required Confined Space
   The workplace in which the WORK is to be performed may contain permit-required confined spaces (permit spaces) as defined 29 CFR 1910.146 and, if so, permit space entry is allowed only through compliance with a confined space entry program meeting the requirements of 29 CFR 1910.146. Contractor shall submit a confined space entry program or submit in writing that compliance with the City's program will be made.
5) Dewatering Permits as required by NDEQ and the Lower Platte South Natural Resources District.
6) Fugitive Dust Control Permit

STORMWATER POLLUTION PREVENTION PLAN

The Contractor shall understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the stormwater discharges associated with the industrial activity from the construction site. For reference the general permit is posted on the City's web site, www.lincoln.ne.gov ; keyword: NPDES.

Additionally, the Contractor, as evidenced by their signature on this proposal, agrees and understands that, if awarded the contract on this project, he/she:

1. becomes a co-permittee, along with the owner(s), to the Nebraska Department of Environmental Quality NPDES General Permit for Stormwater Discharge from construction sites on this project; and

2. is legally bound to comply with the Clean Water Act to ensure compliance with the terms and conditions of the stormwater pollution prevention plan as developed under the NPDES permit and the terms of the NPDES permit; and

3. will hold owners harmless for damages and fines arising as a result of noncompliance with the terms of the stormwater permits and authorizations associated with the work on this project; and

4. shall be responsible for the maintenance of the sediment control measures until permanent stabilization and cover crop is established; and

5. shall complete permanent or temporary stabilization within seven (7) calendar days of soil disturbance to the surface of all perimeter controls, topsoil stockpiles, and any other disturbed or graded areas on the project site which are not being used for material storage, or on which actual earth moving activities are not being performed; and

6. shall complete the approved inspection forms and inspect/maintain all sediment or erosion control practices required under this contract at least once every seven (7) calendar days and after any storm event of greater than 0.5 inches of precipitation, on the site, during any 24-hour period; any necessary repairs or cleanup to maintain the effectiveness of the best management practices shall be made by contractor immediately; and

7. shall update the approved SWPPP plan immediately following any changes or additions to the plan, keep all inspection forms with the SWPPP plan, preferably on-site in a mailbox, and provide copies of all inspection forms and modifications to the SWPPP plan to the JPA's Construction Project Manager, within 48 hours of inspection.

SPECIAL PROSECUTION AND PROGRESS - MATERIALS

Add the following paragraph to Article IV (CONTROL OF MATERIALS):

The Contractor will be allowed to order storm sewer pipe, area drains and other items that are approved as necessary for early construction by the Engineer upon award of the contract. In the event that the contract is not fully executed by reason beyond the control of the Contractor, and the materials have been delivered or firm delivery commitments have been made, the JPA will purchase this material from the Contractor at paid invoice prices plus 10 percent of the total invoice amount for the Contractor's operating and overhead costs.

SPECIAL PROSECUTION AND PROGRESS – CONSTRUCTION PHASING

The following prosecution and progress of work shall be used in developing the baseline schedule for the project. The Contractor will be required to generally proceed with sequencing the construction work as shown on the phasing plans unless otherwise approved by the Engineer.

All work on this project shall be coordinated with the Local Postmaster or their designated representative. All work adjacent to BNSF owned property shall be coordinated with the BNSF's designated project representative as shown on the plans. Continuous vehicular and pedestrian access shall be maintained to the Post Office at all times during the construction of the project.

The Contractor shall be responsible for providing the traffic control plan, stamped and signed by a registered professional engineer, licensed in Nebraska, and submitting to the owner for approval for each phase of the work. The Contractor shall also be responsible for supplying all

temporary construction signs and traffic control devices for the project as outlined in the City of Lincoln Standard Specifications for Municipal Construction.

The Contractor shall not close any portion of the public roads or begin any work which may impact drive access to adjacent properties without the permission of the Engineer. The Contractor shall at all times, to the extent practical, provide facilities of ingress and egress to and from the public street to maintain access to adjacent properties throughout the duration of the project as noted on the plans or as directed by the Engineer.

This may require the Contractor to construct new drives or pavement in phases to allow access from the public street during construction, use high early strength concrete for drive construction, or to provide temporary drives as shown on the plans or as directed by the Engineer. All temporary drives and approaches to provide ingress and egress at adjacent properties shall be provided and maintained by the Contractor. All temporary drives which have active sidewalks (permanent or temporary sidewalks) crossing the drive shall be constructed using temporary hard surfacing and shall be ADA compliant. Crushed rock surfacing shall not be used at temporary drives that have permanent or temporary pedestrian access routed across the drives.

As directed by the Engineer, the Contractor shall furnish and install six foot high temporary chain link fence along the BNSF property and at the Post Office property as shown on the plans to prevent pedestrians from entering the construction area or entering into the BNSF property. The six foot high temporary chain link construction fence may be required at other locations as directed by the Engineer. Temporary chain link fence, six foot in height shall be a contract pay item. The temporary chain link fence along the BNSF tracks shall be constructed prior to the start of other construction work on the project.

All temporary construction fencing that is to be installed adjacent to pedestrian areas and sidewalks shall be ADA compliant. When temporary fencing is used to delineate a pedestrian pathway, a continuous detectable edging should be provided throughout the entire length of the facility such that pedestrians using a cane can follow it. These detectable edgings should adhere to the provisions outlined in the current MUTCD for "Detectable Edging for Pedestrians".

Sidewalk closures and detours shall be clearly posted and maintained throughout the course of the project to direct pedestrians around the construction site. The Contractor will be required to maintain pedestrian access to the Post Office, existing businesses and residences as directed by the Engineer throughout the duration of the project. All temporary pedestrian pathways shall be a continuous hard surface throughout the entire length of the temporary facility and shall be ADA compliant. Temporary 4" thick concrete shall be used as directed by the Engineer to construct temporary sidewalks for pedestrian access. The temporary sidewalks shall be measured and paid in accordance with the contract price bid for concrete sidewalks. Removal of temporary sidewalks shall be paid for at the contract price bid for sidewalk removal.

Phase I shall generally include the construction of the west half of the Post Office parking lot including removal of the existing wall along the west side of the property. The work on this phase shall be completed in conjunction with the work on Phase IC of the Initial Haymarket Site Preparation Project which will reconstruct "R" Street from the BNSF tracks, east to the east side of the 7th Street intersection. During the construction of this phase, "R" Street will be opened to local traffic for access to the Post Office from the 8th and "R" Street intersection.
During Phase I the Contractor shall install pavement markings at "R" Street to layout temporary

parking stalls as shown on the plans for use by Post Office customers. All work associated with marking the temporary parking stalls including signage and covering of existing parking meters shall be considered subsidiary to the pay item for the Traffic Control for the project.

Phase II shall generally include all work associated with construction of the east half of the Post Office parking lot, the north half of the new pavement on "R" Street and the south half of the new pavement on "R" Street between the existing alley/drive and 8th Street as shown on the phasing plans. During construction of this phase of the project, "R" Street between 7th and 8th Street will be closed to through traffic with local access to the alley drive along the south side provided from 7th Street. Access to the Post Office customer parking lot shall be provided from 7th Street during this phase.

Prior to the start of construction work on Phase II, the Contractor shall construct the temporary drive into the Post Office property at 8th and "S" Street and restripe the parking area along the east side of the Post Office property to provide 90 degree parking stalls as shown on the plans. The removal of existing parking lot striping and installation of new pavement markings at this parking lot to change the parking from angle to 90 degree shall be paid for directly. The temporary drive at "R" Street shall be removed at completion of Phase II of the project.

Phase III shall generally include all work associated with construction of the south half of "R" Street between 7th Street and the existing north-south alley between 7th and 8th Streets. During this phase access to the Post Office property shall be provided from 8th and "R" Street and from 7th Street. "R" Street will be closed for through traffic between 7th and 8th Street during this phase.

The Contractor shall notify the Post Office, businesses and property owners a minimum of 7-days in advance of any roadway closures or changes in access to their properties during the work on all phases of this project. The Contractor shall provide temporary hard surfacing as directed by the Engineer to provide access to adjacent properties along the roadways during the construct ion of the project. To the extent practical, the Contractor shall make every effort to minimize the time access is restricted to the adjacent businesses and properties.

The Contractor may submit a revised construction phasing plan to the Engineer for review and approval. The revised construction phasing plan shall identify all streets that will remain open to accommodate local and through traffic within the project area during each construction phase of the project. The revised phasing plan shall take into consideration all traffic requirements and impacts to existing traffic as stipulated in the original phasing plan. The Contractor shall not alter the proposed sequencing shown on the phasing plans without approval of the Engineer and the JPA.

At completion of construction work at the adjacent property, the Contractor shall promptly remove and dispose of all debris and waste material from the site. The Contractor shall not use the temporary construction easement areas for general storage of materials, equipment, or employee parking unless otherwise approved by the Engineer and the adjacent property owner. The Contractor shall limit the time the temporary construction easement areas are disturbed to the time required to complete the work as detailed on the plans. If the Contractor will require additional space outside the street right-of-way for storage of equipment and material during the duration of the project, then the Contractor, at his expense, shall be responsible to secure temporary property rights from the adjacent property owners.

WORKER VISIBILITY

Pursuant to Part 634, Title 23, Code of Federal Regulations, the following modified rule is being implemented:

Effective on January 1, 2008, all workers within the right-of-way who are exposed either to traffic (vehicles using the highway for purposes of travel) or to construction equipment within the work area shall wear high-visibility safety apparel.

High-visibility safety apparel is defined to mean personal protective safety clothing that:

1 -is intended to provide conspicuity during both daytime and nighttime usage, and

2 -meets the Performance Class 2 or Class 3 requirements of the ANSI/ISEA 107-2004 publication entitled "American National Standards for High-Visibility Safety Apparel and Headwear."

If the Contractor fails to comply with the worker visibility requirements and as a result, Federal and State authorities withhold Federal Funds, then JAVA reserves the right to seek reimbursement from the Contractor for the loss of federal funds that are attributed to the Contractor's non-compliance.

COORDINATION WITH OTHERS

This project is tied with the Initial Haymarket Site Preparation Project and the Contractor shall coordinate their work on this project with work on the site preparation project. This shall include scheduling and completing work along "R" Street with the appropriate construction phases for the site preparation project to minimize impacts to traffic flow and access within the project area.

The Contractor shall also coordinate their construction work with LES and other utilities that will need to construct or relocate utilities within the street right-of-way concurrently with the construction of the project.

The Contractor shall coordinate construction of the project with the Local Postmaster or their designated representative. In addition the Contractor shall coordinate work associated with removal and modification of the existing public parking lot to the south of "R" Street with City Parking Services. The Contractor shall provide barricades as necessary to restrict access to the parking lot from the "R" Street area during the construction of the project.

TECHNICAL PROVISIONS

The following Special Provisions amend or supplement the 2006 City of Lincoln Standard Specifications for Municipal Construction and the State of Nebraska Standard Specifications for Highway Construction, 2007 Edition. All provisions which are not so amended or supplemented remain in full force and effect.

CONSTRUCTION STAKING

The Contractor shall use the horizontal and vertical control points as shown on the plans for use in establishing the exact location and elevations for the project. The Contractor shall be responsible for preserving (or reestablishing) these control points if necessary. The Contractor shall use this control to provide all construction staking that is required for the project. This shall include staking for utility construction and all other survey work to complete the project in accordance with the details shown on the plans.

The Contractor shall be responsible for the placement and preservation of adequate ties and references necessary to complete his work. Any additional stakes, templates and other materials necessary for marking and maintaining all reference points and lines shall be the responsibility of the Contractor. The Contractor shall be solely and completely responsible for the accuracy of the line and grade for all features of the work. All work shall be completed to the lines, grades, and elevations indicated on the drawings. The Contractor shall remove and reconstruct work that is improperly located at his expense.

The Contractor shall be required to coordinate with the private and public utilities and shall stake all needed references points or lines needed for the private utilities to adequately construct or relocate their utilities to avoid conflicts with the proposed construction. This shall include all needed finished elevations, tie-in points, line and grades for proposed utilities to be installed by the Contractor or any other points approved by the Engineer. Construction staking for utilities that are not to be relocated as part of this contract shall be approved by the Engineer prior to performing the work.

The Contractor's staking records shall be recorded in a bound notebook, in a format approved by the Engineer. Record notebooks will be submitted to the City of Lincoln at the completion of the project.

Basis of Payment

Construction staking shall not be measured, but shall be paid for at the Contract Lump Sum amount bid for the pay item "Construction Staking". The amount of the lump sum to be included in each partial payment shall be in proportion to the value of the work completed with respect to the total amount of the original bid.

Construction staking to facilitate relocation of public or private utilities not included as part of the project shall be measured by the survey crew hour required to stake the work. The time shall be based upon the amount of time the survey crew is on-site to complete the work including an allowance for reasonable travel time to the site (travel time allowance to the site shall not exceed one half hour per trip). The final measured time for the work shall be as measured by the construction site manager and shall be subject to the approval of the Engineer. Payment for the utility staking shall be paid for in accordance with the amount bid per hour for the item

"Construction Staking for Utilities". Said payment shall include all costs associated with office preparation, reasonable travel time to the site and completion of the staking work by a survey field crew including all labor, equipment, materials and incidentals.

DEWATERING

All dewatering activities associated with construction of the roadway or utilities on this project shall be completed in such a manner to meet the discharge limitations as set forth in the NPDES General Permit for Excavation Dewatering and Hydrostatic Testing Discharges, NPDES Number NEG671000 (Area bounded by 2nd Street, Salt Creek Roadway, 8th Street and J Street, Lincoln, NE) as modified by the Nebraska Department of Environmental Quality per letter to City of Lincoln dated February 18, 2011, attached and incorporated as if fully set forth herein or the discharge limitations of the Lincoln Wastewater Department for discharge into the sanitary sewer. The JPA shall secure the dewatering permit and the Contractor will be required to be a co-permittee on the NDEQ dewatering permit for this project.

The Contractor shall provide and maintain pumps, wells, piping and all other equipment and materials needed to conduct dewatering for the construction activity. Furthermore, the contractor shall provide for complete containerization of all water collected from the dewatering operations. The Contractor shall coordinate with the West Haymarket Environmental Team prior to startup of dewatering activities and present their schedule and their dewatering methods. The West Haymarket Environmental Team will be responsible for the collection of representative samples of the water and the laboratory analysis of the dewatering effluent. Based on the laboratory results the West Haymarket Environmental Team will advise the Contractor on the acceptable disposal methods for the effluent from the dewatering operations. No effluent from the dewatering operations shall be discharged from the construction site until the laboratory testing has been completed and the method of disposal has been determined by the West Haymarket Environmental Team. The Contractor shall allow four work days to receive discharge instructions for each container tested.

The Contractor will be required to furnish Dewatering Containers on-site for temporary storage of the dewatering effluent until testing has been completed and the method of disposal determined. The on-site containers shall be a Baker Frac Tank as manufactured by Baker Corporation (1-800-225-3712, www.bakercorp.com) or an Engineer approved equal tank that will provide the required storage and settling characteristics for the stored water similar to the specified Baker Frac Tank. Each tank shall have an approximate storage volume of 20,000 gallons per tank (minimum volume of 18,900 gallons). The tanks shall also have fixed axles or other means that will allow the tanks to be moved to different locations on the site as necessary to support the various dewatering operations for the project.

The work associated with the dewatering for this project will be measured and paid for directly as shown below based upon the proposed construction activities:

Construction Activity	Measurement and Payment
Dewatering for Storm Sewers	LF of Trench
Furnish Dewatering Container	Each
Dewatering Container Usage	Calendar Day

Dewatering that may be required for the excavation of trenches for utility construction as shown on the plans or stipulated in these Special Provisions shall be measured for payment based upon the linear foot of trench where dewatering is required. Payment shall be made per linear foot of trench dewatering in accordance with the contract bid items "Dewatering for Storm Sewers". Said payment shall be full compensation for furnishing all labor, equipment, tools, materials and incidentals to install, operate and maintain the dewatering operations as necessary to complete the work in accordance with the plans and specifications. Dewatering for boring of utilities, if necessary, will be measured and paid for in accordance with the appropriate bid item for the utility trench dewatering and the measurement/payment shall be based upon the linear feet of the boring.

Measurement and payment for containerizing the effluent from dewatering operations until it is tested and for disposal of the effluent into an adjacent City of Lincoln storm sewer or sanitary sewer will be based on furnishing Dewatering Containers on a per each basis with additional compensation made per calendar day that each Dewatering Container is on-site and available for temporary storage of dewatering effluent. If it is determined that the dewatering effluent cannot be discharged directly to the City of Lincoln storm sewer and that it will need to be discharged to the sanitary sewer, then the fees required by Lincoln Wastewater Department for discharge into the sanitary sewer shall be paid directly by the JPA. The Contractor shall be paid for the work associated with containerizing the dewater effluent and subsequent disposal to the storm sewer or sanitary sewer in accordance with the contract price bid per each for the pay item "Furnish Dewatering Container" and per calendar day that each Dewatering Container is on-site and is available to support the dewatering activities in accordance with the contract unit price bid for the item "Dewatering Container Usage". Such payments shall be full compensation for furnishing the number of containers shown in the proposal for the duration of the dewatering activities including all labor, tools, equipment, materials and incidentals required to containerize and temporarily store the effluent until tested and to discharge the water into an adjacent storm sewer or sanitary sewer as directed by the West Haymarket Environmental Team.

The Contractor shall base their bid on disposal of the dewatering effluent into the City of Lincoln existing storm sewer system or sanitary sewer system. If the West Haymarket Environmental Team determines that the effluent cannot be discharged to the existing City of Lincoln storm sewer system or sanitary sewer system, then additional compensation for disposal of the effluent based upon the required method for disposal as determined by the West Haymarket Environmental Team will be considered on an "Extra Work" basis. Additional payment for filtering or other devices required to maintain the discharged effluent below the maximum total suspended solids limits shown in the NDEQ General Permit NEG670000 shall not be made.

ENVIRONMENTAL CONTINGENCY PLAN

During the execution of the work on this project it is anticipated that the Contractor may encounter contaminated soils, debris or groundwater (media). If contaminated media is encountered and it is determined by the West Haymarket Environmental Team that it cannot be used on-site (e.g. as backfill for the utility trenches), the Contractor shall be required to dispose of any contaminated media in accordance with all federal, state and local laws.

The Contractor shall also strictly adhere to the requirements and procedures set forth in the Environmental Contingency Plan. The Environmental Contingency Plan is attached and incorporated as if fully set forth herein.

In the event the Contractor or on-site construction management personnel suspect that contaminated media is encountered or will be during the performance of the work, they shall immediately notify the West Haymarket Environmental Team and follow the procedures outlined in the Environmental Contingency Plan for resolution on how to manage the contaminated media. Typical indications of potentially contaminated media include discoloration, odors associated with the media removed as part of boring, trenching or other excavation work. In addition, Figures 3A, 3B and 4A, 4B of the Environmental Contingency Plan illustrates where environmental testing has been taken on-site. The Contractor shall familiarize themselves with these Figures to determine whether the project is located in the area of these environmental impacts.

Management of Soil or Debris to be Removed from the Work Site

During the course of the project the Contractor shall not haul any excavated material off-site without the prior approval of the West Haymarket Environmental Team. As such, the Contractor shall provide locations on-site to temporarily stockpile all excavated material. All temporary stockpiles shall comply with the requirements set forth in the Construction Storm Water Pollution Prevention Plan (SWPPP). The West Haymarket Environmental Team will determine the appropriate method for disposal of the excavated material and make a recommendation to the Contractor.

The Contractor shall base their bid on the basis that any excavated material to be disposed off-site can be disposed of at a location selected by the Contractor in accordance with all federal, state and local regulations with no other special handling or restrictions. If the excavated material requires special handling due to contamination (petroleum or other chemicals) and the contamination is not the result of the Contractor's activities, then additional compensation for disposal of the contaminated material will be considered on an "Extra Work" basis.

GENERAL CLEARING AND GRUBBING

The Contractor shall not remove or clear any trees on this project between March 15th and August 31st without first having a bird survey completed to verify that there are not any nesting birds present. All bird surveys shall be completed by the West Haymarket Environmental Team and the Contractor shall not begin any clearing work until verification has been provided that there are no nesting birds.

TEMPORARY SURFACING

Temporary surfacing shall be provided as shown on the plans or as directed by the Engineer to facilitate construction of the work and to accommodate traffic or access to adjacent properties as directed by the Engineer. The temporary surfacing shall be either 6" Concrete Pavement or 8" Asphaltic Concrete Pavement. Asphalt shall be Asphaltic Concrete Surface Course Type 2P in accordance with the requirements of these Special Provisions. The Contractor shall have the option to provide either material for full depth temporary surfacing subject to availability of the material and the approval of the Engineer. Temporary surfacing for wedges or transitions constructed on top of existing pavement shall be Asphaltic Concrete Surface Course Type 2P.

Payment for temporary surfacing shall be paid for at the contract unit price bid per square yard for "Temporary Surfacing" and shall include both placement and removal of the temporary surfacing as required to construct the improvements as shown on the plans. Such payment shall be full compensation for all labor, equipment, and material to furnish and place the temporary surfacing, subgrade preparation, and removal of the temporary surfacing at the locations shown on the plans or as directed by the Engineer. Removal of the temporary surfacing to allow construction of the new pavement or grading adjacent to the roadway shall not be paid for directly and these costs shall be included in the price bid per square yard for the temporary surfacing.

REMOVE POST

The Contractor shall remove existing posts including foundations at the locations noted on the plans or as directed by the Engineer. The Contractor shall contact the adjacent property owner or City of Lincoln (if the posts are within the right-of-way) prior to removal of the post to determine if the property owner or City would like to retain the salvaged post for reinstallation at the completion of the project. If the property owner does not want the salvaged post than the Contractor shall properly dispose of the post off-site. The Contractor shall exercise care in the removal of all posts to be salvaged so as not to damage the post.

The Contractor shall backfill the area where the foundation or concrete base for the post is removed to match the existing grade elevations or the subgrade elevation for the proposed surfacing or the finished ground elevations at turf areas. Foundations or concrete bases for posts shall be completely removed and promptly disposed of off-site.

Measurement and payment for removal of existing posts will not be differentiated by size or type and shall be paid for at the contract unit price bid per each for the pay item "Remove Post". Said payment shall be full compensation for furnishing all labor, equipment, and material required for removal, disposal, backfill and compaction, and all other incidental items required to remove and dispose of the existing posts or to salvage the posts in the event the adjacent property owner or City would like to retain the posts.

REMOVE AND SALVAGE BRICK PAVERS

The Contractor shall remove and salvage existing brick at the locations shown on the plans or as directed by the Engineer. The Contractor shall exercise extreme care when removing the pavers so as not to damage the bricks. The salvaged pavers that are in good, unbroken condition shall be delivered to the City of Lincoln Parks and Recreation Old Nursery storage yard located on Park Boulevard, south of South Street and Sherman Field. All damaged pavers shall be disposed of immediately off-site by the Contractor.

The Contractor shall coordinate the delivery of the brick pavers to the storage yard with the City. The City's contact person for this work is Jerry J. Shorney, phone number 402-441-8259.

Measurement and payment for removal and salvaging of existing brick pavers shall be paid for at the contract unit price bid per square foot for the pay item "Remove and Salvage Brick Pavers". Said payment shall be full compensation for furnishing all labor, equipment, and material required for removal, salvaging, delivery of the salvaged pavers to the City of Lincoln storage yard, and all other incidental items required to complete the work associated with removal and salvaging of the existing brick pavers on the project.

REMOVE STORM DRAIN (EXISTING STRIP DRAIN)

The Contractor shall remove the existing slotted drains cast in the pavement at the Post Office parking lot as part of the pavement removal operations. In addition to removing the slotted drains the Contractor shall remove the outlet pipe from the drain to the outlet storm sewer that is to remain in service and a construct a concrete plug as directed by the Engineer. The work associated with removal of the slotted drain, outlet pipe from the slotted drain and constructing a concrete plug at the connection to the main storm sewer shall be paid for directly.

Measurement and payment for removal of existing slotted drains posts will not be differentiated by size or type and shall be paid for at the contract unit price bid per each for the pay item "Remove Storm Drain (Existing Strip Drain)". Said payment shall be full compensation for furnishing all labor, equipment, and material required for removal, disposal, backfill and compaction, and all other incidental items required to remove and dispose of the existing drains, outlet pipes and plugging of the outlet pipe at the connection to the outlet storm sewer that is to remain in use.

REMOVE RETAINING WALL

The Contractor shall remove existing retaining walls or other free standing walls at the locations shown on the plans or as directed by the Engineer. Removal of the walls shall include the entire wall, stem and footing. All material resulting from the removal of the walls shall be promptly disposed of off-site. Retaining walls or other free standing walls that are to be partially removed with a portion of the wall to remain in place shall be carefully saw cut to provide neat lines and a smooth surface at the point of removal. The Contractor shall be required to provide any grouting, masonry or concrete repair work adjacent to the removal line to provide a sound surface at those portions of the wall to remain in place as directed by the Engineer. The Contractor shall backfill the area where the retaining walls are removed to match the existing grade elevations or the subgrade elevation for the proposed surfacing or the finished ground elevations at turf areas.

Payment for removal of existing retaining walls or other free standing walls will not be differentiated by size or type and shall be paid for at the contract unit price bid per linear foot for the pay item "Remove Retaining Wall". This shall be full compensation for furnishing all labor, equipment, and material required for removal, disposal, backfill and compaction, and all other incidental items including saw cutting, grouting, masonry repair and concrete surface repair work required at those portions of existing walls that are to remain in place.

TEMPORARY CHAIN LINK FENCE

The work covered by this section shall consist of furnishing all labor, equipment, tools, materials and incidentals necessary to construct a 6-foot high temporary chain link fence at the locations shown on the plans or as directed by the Engineer to discourage pedestrians from entering the construction area or to serve as delineation along the pedestrian pathway. The temporary chain link fence shall be constructed in accordance with the requirements outlined in Chapter 9 of the Standard Specifications.

The line and terminal posts at the temporary fence shall be driven into the ground and permanent concrete footings are not required. Temporary fence at existing hard surfaces shall have a suitable base to support the fence and to prevent it from tipping. Pipe railings shall be installed at the top and bottom of the temporary fence. The fabric shall be installed with hog ring clips at a maximum spacing of two feet along the top and bottom of the rails. Post spacing shall not exceed ten feet.

All temporary construction fencing that is to be installed adjacent to pedestrian areas and sidewalks shall be ADA compliant. When temporary fencing is used to delineate a pedestrian pathway, a continuous detectable edging should be provided throughout the entire length of the facility such that pedestrians using a cane can follow it. These detectable edgings should adhere to the provisions outlined in the current MUTCD for "Detectable Edging for Pedestrians".

The fence shall be maintained by the Contractor throughout the duration of the construction in a satisfactorily manner as directed by the Engineer. The fence shall be removed at the completion of the work or as necessary to complete sidewalk construction and finish grading.

Temporary chain link construction fence that is installed at the direction of the Engineer shall be measured and paid for at the contract unit price bid per linear foot for the pay item "Temporary Chain Link Fence". Said payment shall include furnishing all labor, equipment, materials and incidentals required to install the fence, maintain the fencing and removal/disposal of the fence at the completion of the project.

HIGH EARLY STRENGTH P.C. CONCRETE PAVEMENT

The Contractor shall provide High Early Strength Portland Cement Concrete for use at roadways and drives as shown on the plans or as directed by the Engineer to facilitate access to adjacent properties or opening of the roadways. High Early Strength Portland Cement Concrete for roadways and drives shall be City of Lincoln L5500 Concrete.

The Contractor, at his option, may elect to use the High Early Strength Concrete at other locations to facilitate his operations, subject to approval of the Engineer. Additional payment will not be made over and above the unit price bid for Concrete Pavement, for use of High Early Strength Concrete under these circumstances.

Payment for High Early Strength Concrete as shown on the plans shall be in accordance with the appropriate pay item and contract unit bid price. To facilitate construction of the project, the Engineer may direct the Contractor to use High Early Strength Concrete at locations other than those shown on the plans.

At locations where the contract has not established a unit price for the type and thickness of the High Early Strength Portland Cement Concrete to be constructed, the Contractor shall receive an additional payment of $12.00 per cubic yard (based upon the volume of the in-place concrete), in addition to the unit price specified for the type and thickness of the concrete pavement shown on the plans, for use of High Early Strength Portland Cement Concrete Pavement that is authorized by the Engineer.

The in-place volume of the concrete shall be calculated using the depth shown on the plans or shall be the depth specified by the Engineer.

No substitution of fly ash for Portland Cement will be allowed for High Early Strength Concrete on this project.

AREA DRAIN

Area drains shall be constructed at the locations shown on the plans and in accordance with the details shown. All area drains shall be set in concrete and shall have the necessary flanges or connections to securely anchor the inlet to the concrete. The area drain shall be set and the concrete surrounding the drain finished so that drainage flows to the inlet without water bypassing the drain.

Area drains that are to be located below roof drain outlets shall include construction of the necessary pipe, elbows and fittings necessary to direct the flow from the roof drain outlet to the area inlet. All piping and fittings associated with the existing roof drain outlet necessary to direct flow to the area inlet shall be subsidiary to payment for the area inlet.

Area drains shall be 12-inch Inline Drains, suitable for connection to PVC outlet piping, as manufactured by Nyloplastic America, Inc. or approved equal. The area drains shall be furnished with pedestrian safe grates and the necessary fittings to connect to a 12-inch PVC outlet pipe. The work shall be completed in accordance with the requirements outlined in Chapters 20 and 21 of the Standard Specifications

Area drains shall be measured and paid for at the contract unit price bid per each for the pay item "Area Drain". Said payment shall be full compensation for furnishing all labor, equipment, materials and incidentals required to construct the area drain as shown on the plans and in accordance with these Special Provisions including, forming, reinforcing steel, concrete placement, consolidation, cast iron grate and frame, excavation, backfill, compaction and all other incidental items required to provide a complete and functional area drain.

PVC STORM SEWER

Polyvinyl chloride (PVC) storm sewer pipe shall be constructed in accordance with the details shown on the plans and the requirements of Sections 722 and 1038 of the NDOR Standard Specifications. All PVC storm sewer pipe shall be schedule 40. Fittings and bends shall be provided as shown on the plans. Fittings and bends shall not be paid for directly but shall be considered subsidiary to the pipe. All PVC pipe shall be bedded with a granular material to 6 inches above the top of the pipe. The Contractor shall exercise care so as not to damage the pipe during construction of the new pavements.

Measurement and payment for PVC storm sewer pipe shall be made at the contract unit price bid per linear foot for the various sizes of PVC storm sewer pipe shown in the bid proposal. Said payment shall be full compensation for all labor, equipment, materials and incidentals required to construct the PVC storm sewer pipe as shown on the plans and in accordance with these Special Provisions including, pipe, fittings, bends, bedding, trenching and backfill.

5" REINFORCED CONCRETE SIDEWALK

The 5" Reinforced Concrete Sidewalk shall be constructed in accordance with the details shown

on the plans and the requirements outlined in the City of Lincoln Standard Specifications for concrete sidewalk construction. The sidewalk shall be reinforced and constructed with a concrete turndown as shown on the plans. The sidewalk shall be measured and paid for based upon the square footage of the top surface of the sidewalk in accordance with the contract unit price bid for the pay item "5" Reinforced Concrete Sidewalk". Said payment shall be full compensation for furnishing all labor, equipment, tools, materials and incidental items required to construct the sidewalk including reinforcing steel, turndown, joint fillers/sealers, sleeves for railings, excavation, compaction, backfill and all other incidental items required to complete the work in accordance with the details shown on the plans and as directed by the Engineer.

42" PEDESTRIAN PIPE RAILING

The work covered by this section shall consist of furnishing all labor, equipment, tools, materials and incidentals necessary to construct the 42" high pedestrian railing as shown in the plans and in accordance with the requirements of Section 716 of the NDOR Standard Specifications. The type, size, location, grade, length and alignment of the railing shall follow the top of the sidewalks or retaining walls as indicated on the plans.

The railing shall be designed to follow the horizontal and vertical alignment of the top of the retaining walls with all posts set plumb as shown on the plans. The railing manufacturer shall design and furnish adequate expansion joints along the length of the railings as noted on the plans to ensure that the railing does not distort or warp due to changes in temperature.

The railing shall be galvanized, brush blasted and painted as specified in these special provisions with powder coated paint system. All railings shall be protected during shipping to avoid damage to the coatings. Any damage to the coating that may occur during shipping or installation of the railing shall be immediately repaired as recommended by the paint manufacturer and to the satisfaction of the Engineer.

The steel pipe railing shall be measured and paid for by the linear foot in accordance with the contract unit price bid for the item "42" Pedestrian Pipe Railing". Said payment shall be full compensation for furnishing all materials, equipment, tools, labor and incidentals necessary to construct the railing including posts, rails, connection plates, anchor bolts, galvanizing, brush blasting and paint preparation, shop painting, and touch-up painting in the field.

PARKING LOT LIGHTING UNIT

The Contractor shall furnish and install the following Parking Lot lighting units that include the fixture, pole, foundation and incidentals at the locations shown on the plans. Light Standards of the various types complete, in place and accepted by the Engineer, shall be measured as single units and shall be paid for at the contract unit price bid per each for the item. This price and payment shall be full compensation for furnishing and/or installing the Poles, luminaires and for furnishing lamps, labor, equipment, tools, materials, and incidentals necessary to complete the Work.

1. Lighting Unit Type "A": Parking Lot Lighting Unit with Type 4 distribution, Lithonia Lighting: KAD/400M/R4/TB/SPD4/DDB/LPI.

The Roadway Lighting Pole will be a Valmont: #DS330/500W300/D1/FST/DB, 30' fixture mounting height, with festoon box mounted 2'-0" above bottom of pole. Contractor to provide/install WP/GFI receptacle.

Measurement and Payment for the Lighting Unit, Type A shall be made at the contract unit price bid per each for the pay item "Lighting Unit, Type A". This shall be full compensation for all labor, equipment, material and incidental items required to install the lighting units in accordance with the details shown on the plans.

2. Lighting Unit Type "B": Parking Lot Lighting Unit with Type 4 distribution, Lithonia Lighting: (2) KAD/400M/R4/TB/SPD4/DDB/LPI.

   The Roadway Lighting Pole will be a Valmont: #DS330/500W300/D2/FST/DB, 30' fixture mounting height, with festoon box mounted 2'-0" above bottom of pole. Contractor to provide/install WP/GFI receptacle.

   Measurement and Payment for the Lighting Unit, Type B shall be made at the contract unit price bid per each for the pay item "Lighting Unit, Type B". This shall be full compensation for all labor, equipment, material and incidental items required to install the lighting units in accordance with the details shown on the plans.

The Contractor shall install lighting units and foundations as detailed in the plans and these special provisions. The Contractor shall supply all necessary poles, foundations, luminaries, bolts, nuts, washers, internal wiring and wiring devices required for a complete installation for each type of lighting unit.

REMOVE EXISTING WALL PACK

Contractor shall remove disconnect and remove existing wall pack and associated wall mounted RGS conduit. Existing conduit and fixture shall be salvaged back to USPS.

Measurement and Payment for the Removing Existing Wall Pack shall be made at the contract unit price bid per each for the pay item "Remove Wall Pack". This shall be full compensation for all labor, equipment, material and incidental items required to remove the lighting units in accordance with the details shown on the plans.

RE-WIRE MULTI-TAP BALLAST

Contractor shall Re-Wire Multi-Tap Ballast for necessary operation and make necessary electrical connections to existing fixtures to ensure a functional lighting system.

Measurement and Payment for the Re-Wire Multi-Tap Ballast shall be made at the contract unit price bid per each for the pay item "Re-Wire Multi-Tap Ballast". This shall be full compensation for all labor, equipment, material, coordination with LES, and incidental items required to Re-Wire Multi-Tap Ballast in accordance with the details shown on the plans.

REMOVE/REPLACE EXISTING SHOEBOX FIXTURE

Contractor shall Remove/Replace Existing Shoebox Fixture and make necessary electrical connections to new fixture to ensure a functional lighting system. Existing fixture being removed is a 240 volt unit and is to be removed and replaced with a 208 volt unit. Make, model, color, and distribution type to match existing. Contractor shall verify if existing fixture contains a Multi-tap Ballast prior to removing and if it does, shall rewire for 208 volt operation and a deduct for the new fixtures shall be applied .

Measurement and Payment for the Remove/Replace Existing Shoebox Fixture shall be made at the contract unit price bid per each for the pay item "Remove/Replace Existing Shoebox Fixture". This shall be full compensation for all labor, equipment, material, coordination with Public Works and USPS, and incidental items required to Remove/Replace Existing Shoebox Fixture in accordance with the details shown on the plans.

CONDUIT/CIRCUIT IN USPS BUILDING

Contractor shall core drill wall into the USPS building, install necessary RGS conduit/ conductors and make necessary electrical connections to existing USPS control/electrical panel F2 to ensure a functional lighting system. Contractor shall also install necessary breaker as shown on the plans. Contractor shall verify existing conduit/conductor sizes for existing receptacle and lighting circuits for possible re-use. Contractor shall notify engineer of existing sizes and approval of reuse shall be by Engineer. If either conduit, conductors or both are able to be reused, a deduct shall be applied.

Measurement and Payment for the Conduit/Circuit in USPS Building shall be made at the contract unit price bid per lineal feet for the pay item "Conduit/Circuit in USPS Building". This shall be full compensation for all labor, equipment, material, coordination with Public Works and USPS and incidental items required to add the Conduit/Circuit in USPS Building in accordance with the details shown on the plans.

ELECTRICAL LIGHTING CIRCUIT ADDITION

Contractor shall install necessary RGS conduit and make necessary electrical connections to existing Parks electrical panel to ensure a functional lighting system. Contractor shall also install necessary breaker and control as shown.

Measurement and Payment for the Electrical Lighting Circuit Addition shall be made at the contract unit price bid per lump sum for the pay item "Electrical Lighting Circuit Addition". This shall be full compensation for all labor, equipment, material, coordination with Public Works and LES, and incidental items required to add the additional lighting circuit in accordance with the details shown on the plans.

FIBER VAULT

The Contractor shall furnish and install fiber vaults at the locations shown on the plans and as directed by the Engineer. The fiber vaults and their covers are required to conform to all test provisions of ANSI/SCTE 77 "Specifications For Underground Enclosure Integrity" Tier 22 and labeled as such inside the vault and on top of the cover. All covers are required to have a

minimum coefficient of friction of 0.05 in accordance with ASTM C1028. Independent third party verification or test reports stamped by a registered Professional Engineer certifying that all test provisions of this specification have been met are required with each submittal.

The fiber vault shall be constructed of epoxy or polyester resin mortar with woven glass fiber reinforcement and have appropriate aggregate dimensions of 30" X 48" X 36"(Depth) with an open bottom. Fiber vault covers shall have a split lid and be labeled "FIBER" on top as indicated in plans.

The fiber vault shall rest firmly on a bed of ¾" washed crushed limestone rock with a minimum depth of 12" below the bottom, extending at least 3" beyond the outside edges of the vault. Avoid placing these vaults in concrete. Set handholes flush with the finished surface of the surrounding ground. Do not install lid bolts. Fiber vault edges, lid and lifting eye shall be kept clear of concrete and foreign material. Conduit shall enter the handhole from the bottom and extend conduit ends between four (4) and six (6) inches above the aggregate bedding. Side penetrations are not permitted.

Fiber vaults, complete, in place and accepted by the Engineer, will be measured for payment as single units and shall be paid for at the contract unit price bid per each for the pay item "Fiber Vault (30" X 48" X 36")". This price shall be full compensation for all excavation required; for furnishing and installing the pull box; for conduit, conduit stub out, concrete, and crushed rock; and for all labor equipment, tools, materials, and incidentals required to complete the work.

PARKING METER POST

The Contractor shall furnish and install galvanized steel parking meter posts at the locations shown on the plans. The meter posts shall be fabricated and installed in accordance with the details shown on the plans. The length of the meter posts for locations where the posts will be set within the concrete sidewalk shall be 50 ½ inches. The length of meter posts to be set in turf/dirt areas shall be 63 inches. The top of all installed meter posts shall be 42 inches above the finished grade.

Meter posts shall be nominal 2-inch diameter Schedule 40, threaded and coupled, galvanized steel pipe meeting the requirements of ASTM A-53 Grade B. All meter posts shall be provided with three 5/16 inch diameter weep holes at the bottom of the posts as shown on the plans. The posts shall be set 1'-6" behind the back of the curb and shall be either cast in-place with construction of the concrete sidewalk or they may be set by coring the sidewalk and setting the post in the cored hole with an approved post setting cement.

The work associated with furnishing and installing the parking meter posts shall not be differentiated by length of post and shall be measured and paid for in accordance with the contract unit price bid per each for the pay item "Parking Meter Post". Said payment shall be full compensation for furnishing all labor, equipment, materials and incidentals required to furnish and install the new meter posts in accordance with the details shown on the plans including any core drilling at the sidewalks that may be required to complete the installation.

HANDICAP PARKING PAVEMENT MARKING

The Contractor shall furnish install handicap pavement markings at the parking stalls shown on the plans for the Post Office parking lot. All handicap stall markings shall be installed in accordance with the details shown. All handicap parking stall markings shall be painted or other Engineer approved material. Paint markings shall conform to the requirements outlined in the State of Nebraska Standard Specifications for Highway Construction, 2007 Edition.

Measurement and payment for handicap parking pavement markings shall be made at the contract unit price bid per each for the pay item "Handicap Parking Pavement Marking". Said payment shall be full compensation for all labor, equipment, materials and incidentals required to furnish and install the handicap pavement marking as shown on the plans and in accordance with these Special Provisions and the State of Nebraska Standard Specifications for Highway Construction, 2007 Edition.

FINE GRADING/PARKING SPACE FINISH

All areas to be sodded or permanent seeded shall be fine graded prior to installation of the sod or seeding. Fine graded areas shall be completed to match the finished grades and lines indicated on the plans. All work associated with the fine grading shall be completed in accordance with the requirements outlined for parking space finish in Chapter 2.00 of the City Standard Specifications.

Payment for fine grading at areas disturbed by grading and in conformance with the City Standard Specifications shall be measured and paid for at the contract unit price bid per square yard for the item "Parking Space Finish". Such payment shall be full compensation for furnishing all labor, equipment, materials and incidental items required to complete the fine grading in accordance with the requirements outlined in the Specifications.

SEEDING TYPE "B"

Type "B" Seeding on this project shall consist of United Seeds Super Turf II Turf Type Tall Fescue/Kentucky Bluegrass/Perennial Ryegrass Mixture. Section 30.05 of the City of Lincoln Standard Specifications for Municipal Construction is amended to incorporate the following criteria for the Type "B" seed mixture:

Super Turf Type II LS
Contains: 88% Turf Type Tall Fescue (Firecracker LS, Spyder LS, Mustang 4 and Firenza Turf Type Tall Fescue), 7% Blue Chip Plus and Everest Kentucky Bluegrass and 5% La Quinta Perennial Ryegrass.

Seeding Rates
New Seeding: 10 Lbs per 1,000 Sq ft
Over-seeding: 5 Lbs per 1,000 Sq Ft
Over-seeding High Use Areas: 12 Lbs 1,000 Sq Ft

Seeding Dates
March - May, August - October
Dormant Seed - December – March

Permanent seeding, fertilizing and mulching of the site shall be provided at all finish graded areas outside the limits of the proposed construction at the new arena and rock/hard surfaced access road areas upon completion of site grading operations.

SEEDING AND SODDING ESTABLISHMENT

Section 30.11 of the City of Lincoln Standard Specification for Municipal Construction shall be amended to stipulate that the Contractor shall be responsible for adequately watering and maintaining all sodded areas for a period of thirty (30) days following the initial sodding operation (maintenance of sodded areas shall include all required daily watering, weed control, maintenance fertilizing and mowing). Any portion of the sodded area that is not in good growing condition at the end of this thirty (30) day period shall be removed and replaced with fresh live sod at the expense of the Contractor. If the sod has been replaced the watering and maintenance period shall begin again for thirty (30) days following the replacement.

Section 30.11 of the City of Lincoln Standard Specification for Municipal Construction shall also be amended to stipulate that the Contractor shall be responsible for maintaining of all seeded areas for a period of forty-five (45) days following the initial seeding operation (maintenance of seeded areas shall include all required daily watering, weed control, maintenance fertilizing and mowing). Any portion of the seeded area that is not in good growing condition at the end of this thirty (45) day period shall be removed and reseeded with new seed at the expense of the Contractor. If the seed has been replaced, the watering and maintenance period shall begin again for forty-five (45) days following the replacement. If the Contractor does not comply with these standards, then liquidated damages will be enforced until the area is acceptable to the Engineer.

COVER CROP SEEDING

The Contractor shall provide cover crop seeding at all disturbed or cleared areas where pavement construction, finished grading or other construction activities will not be starting within 21 days or as directed by the Engineer to control erosion. The cover crop seed shall be an annual rye grass and shall be seeded at a rate of three pounds per 1,000 square feet unless an alternate seed mixture and seeding rate is approved by the Engineer. The seeded areas shall be fertilized and mulched in accordance with the requirements of Chapter 30 of the City of Lincoln Standard Specifications for Municipal Construction. The Contractor shall water and maintain the areas to be cover crop seeded as specified in the section "Seeding and Sodding Establishment". Cover crop seeding shall be measured by the acre and such payment shall be full compensation for furnishing all labor, equipment, materials and incidental items including seed, mulch and fertilizer required to establish the cover crop.

PAINTING FOR PIPE RAILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Surface preparation and shop application of coatings for metal pipe railings.

1.2 SYSTEM DESCRIPTION

A. Conform to applicable code for flame and smoke rating requirements for products and finishes.

1.3 SUBMITTALS

A. Product Data: Provide data on all finishing products.

B. Samples: Submit two metal chip samples, 6 x 6 inch in size illustrating color and texture for each surface finishing product scheduled.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Store and apply materials in environmental conditions required by manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Paint System

Epoxy-polyester Hybrid primer with color to match finish coat.

TGIC Polyester powder coat paint system, meeting or exceeding the following properties:

Adhesion (ASTM D-3359, Method B):
Using pressure sensitive tape, no coating is lifted or removed between 1/8" cross-hatch scribes. (Rating = 5B)

Pencil Hardness (ASTM D-3363):
Using EagleTurquoise pencil leads surface hardness ranges from H to 2H.

Impact Resistance (Modified ASTM D-2794):
Using a falling weight impact tester, the film surface withstands up to 160 inch lbs. of direct and reverse impact.

Flexibility, Mandrel (Modified ASTM D-522):
The film surface withstands a 180° bend over a 1/8" diameter with no loss of adhesion or surface cracking.

Abrasion Resistance (Modified ASTM D-4060):
Coating weight loss after 1,000 cycles of Taber abraser equipped with CS-10 wheels loaded to 1 kg per wheel is approximately 40-60 mg.

Salt Spray Resistance (ASTM B-117):
Scribed Bonderite 1000 steel panels in a 5% salt fog at 95°F and 1200% relative

humidity, exhibit no undercutting of the film after 500 hours exposure. No resting or blistering occurs on panel face away from scribe. After 1,000 hours there is less than 1/16" undercutting. Alodine 1200 aluminum panels shall show no effect after 1,000 hours.

2.2 FINISHES

A. Color for all Metal Railings shall be a standard black, Semi-Gloss Finish.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that substrate conditions are ready to receive Work.

B. Correct minor defects and clean surfaces which affect work of this section.

C. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

D. Uncoated Ferrous Surfaces: Sandblast all surfaces to receive powder coating to a "white" finish.

E. Pre-Treatment: All surfaces shall be pre-treated with a 5-stage iron phosphate pre-treatment system.

3.2 APPLICATION

A. Apply first coat, epoxy-polyester hybrid primer, as per manufacturer's instructions.

B. Apply second coat, TGIC Polyester powder coat in accordance with manufacturer's instructions.

C. 2-Coat system shall have a minimum of 5 mils cured film thickness.

3.3 CURING

A. Cure finish as per manufacturer's specifications.

3.4 DELIVERY

A. Painted products shall be delivered to the site on palettes and protected as necessary to assure no marring, scratching or other damage occurs to the finished products. Architect reserves the right to reject any finished product delivered to site exhibiting damage affecting the product finish.

B. Painted products shall be installed without damage to the product finish. Minimal damage may be field repaired. Architect reserves the right to reject any components exhibiting significant damage, as determined by the Architect.

ADDITIONAL SPECIFICATION SECTIONS

The following Chapters 5, 11, 12 and 24 of the City of Lincoln Standard Specifications for Municipal Construction are attached and shall be considered a part of these project Special Provisions. In addition, the Environmental Contingency Plan is also attached by reference to these contract documents.

ASPHALTIC CONCRETE CONSTRUCTION

5.00 GENERAL

Asphaltic concrete mixtures required for surface courses, base courses, overlays, wedge courses, and patching shall be placed as hereinafter specified. Asphaltic concrete shall be bid and paid for by the ton as defined in these specifications.

Patching shall be defined as pavement replacement of areas requiring small quantities of asphaltic concrete per placement such as utility crossings and repair, returns to existing streets, or larger quantity placements such as longitudinal cuts for utility work not requiring curb to curb asphalt replacement, temporary pavement, and for other similar situations as directed by the Engineer.

5.01 RELATED ITEMS SPECIFIED ELSEWHERE

Asphaltic Concrete Special Provision

5.02 MATERIALS

A. ASPHALTIC CONCRETE MIXTURES

Asphaltic Concrete shall be an approved mix as shown on the Plans or in the Contract Special Provisions and as defined in Chapter 12 of these Specifications.

B. NON-WOVEN PAVEMENT OVERLAY FABRIC

Non-woven overlay fabric shall be needle punched, polypropylene fabric conforming to the following requirements:

PROPERTY	TYPICAL	MINIMUM
Mass, g/m^2	145	129
Tensile Strength, newton (N)	512	400
Elongation at Break, %	60	55
Mullen Burst Strength, kPa	1515	1375
Asphalt Retention, L/m^2	----	0.90

Acceptance shall be based upon manufacturer's certification of conformity.

5.03 EQUIPMENT

All equipment, tools and machinery shall be adequate for the purpose for which it is to be used, and shall be maintained in satisfactory working condition at all times. The equipment shall be at the Work site sufficiently in advance of construction operations to be thoroughly examined and approved by the Engineer. The Contractor shall furnish the necessary accessories, equipment data, and assistance required by the Engineer for making tests and calibrations on equipment.

A. DISTRIBUTORS

Whenever the use of a distributor is required, that piece of equipment shall be manufactured expressly for the purpose of applying heated asphaltic materials by pressure spray applications. Improvised equipment, such as converted road oilers, will not be acceptable. The distributor shall be so designed as to permit the application of heated asphaltic material in a uniform spray without atomization at the rate, temperature, and pressure required. The distributor shall be equipped with a tachometer registering revolutions per minute and so located as to be visible to the driver in order that the driver may maintain the constant speed required for the specified rate of application. The distributor shall be mounted on a motor truck or trailer, equipped with pneumatic tires. The pump shall be equipped with a meter registering the number of gallons (liters) per minute passing through the nozzle and this meter must be visible to the operator. The distributor shall be equipped with an accurate thermometer which indicates the temperature of the asphaltic materials at all times. The distributor shall be equipped with a full-circulating spray bar and shall be provided with hand-nozzles to permit application to areas not accessible to the spray bar. The distributor shall be equipped with a drip tray or other suitable means of preventing the dripping of material after the flow has been shut off.

B. ASPHALT SPREADER AND FINISHER

The mechanical asphalt spreader and finisher shall be self-propelled and shall be designed and equipped to spread upon the prepared surface without segregation of the mixture, a tamped and finished wearing surface of asphaltic concrete free from hollows and humps.

The machine shall be equipped with a hopper to receive the asphaltic concrete as it is dumped from the trucks and shall be designed so as to prevent the mixture from being deposited directly on the base or previously laid courses. The hopper shall have a suitable device to distribute the mix evenly across the full width of the screed. The machine shall be equipped with means of adjusting the thickness of the mat, and the transverse and longitudinal grade. It shall be equipped with a tamping or vibrating screed which shall be operated during the lay-down process to compact the applied material to a uniform density. No part of the machine shall travel on the freshly laid material. There shall be auxiliary attachments for the machine so it shall be operated to lay widths as approved by the Engineer.

C. ROLLERS

The number of rollers furnished shall be not less than two independent units, one being a steel wheeled roller and the other a pneumatic tire roller. In lieu of two rollers, one may be used if it is a vibratory roller with one set of pneumatic tires and with separate controls for energy and propulsion, which produces the specified density and a satisfactory surface.

Wheels of all rollers shall be smooth and free from openings or projections which would mar the surface of the Work. They shall be equipped with suitable devices necessary to prevent adhesion of bituminous material to the tires and wheels. The rollers shall be equipped with water tanks for wheel sprinkling devices that extend the full width of each roller, and drip pans designed so as to prevent oil, grease, gas or diesel oil from spilling or dripping onto the asphaltic concrete surface.

D. SURFACE PLANER

The planing machine shall be self-propelled, of sufficient weight, size, power and traction to remove surface irregularities without tearing or displacing of the remaining asphaltic surface or concrete pavement. The cutting edge or drum shall be designed and constructed to permit adjustment to match the existing roadway crown. The machine shall be so designed to permit operation against all curbs, catch basins, inlets and other appurtenances within the Work area. The minimum grinding or planing width of the machines shall be 30 inches. Alternate equipment will not be acceptable without prior written approval of the Engineer.

E. TRUCKS

Numbered trucks having tight, clean, smooth beds shall be used for transporting the freshly prepared asphaltic concrete to the site of the Work. The beds shall be sprayed, when necessary, to prevent the asphaltic concrete mixture from adhering to the bed, with a minimum quantity of approved lubricant. The equipment used and the frequency of spraying shall be determined by the Engineer.

All trucks shall be equipped with a suitable waterproof canvas cover to protect the material as required by the Engineer. Any truck that causes excessive segregation of materials by the action of its spring suspension or other contributing factors, or that causes undue delays, shall not be used for transporting the asphaltic concrete mixtures. All truck beds shall be so constructed that they may be insulated, when necessary. All truck boxes shall be equipped with box vibrators.

5.04 PREPARATION OF EXISTING SURFACE

A. CLEANING

Prior to the application of asphaltic materials on existing base, the surface on which the asphalt is to be placed shall be thoroughly cleaned by means of mechanical sweepers, street flushers, shovels, scrapers, and hand brooms as is necessary to remove all mud, matted earth, dust and other foreign materials. Power brooming shall be conducted in such a manner as to keep dust and debris under control and cause a minimum of disturbance to surrounding areas. Material cleaned from the surface shall be removed and disposed of by the Contractor.

The cost of cleaning the existing surfaces to which asphalt is to be applied shall be considered subsidiary to other items for which payment is made.

B. SURFACE PLANING

Surface planing shall consist of grinding or planing of existing asphaltic or concrete pavements to remove any surface irregularities to within a predetermined specified limit, in accordance with the requirements of these Specifications, at locations shown in the plans, or as directed by the Engineer.

Unless the total street width is to be planed, prior to beginning the operation the Engineer shall indicate all individual areas to be planed. These areas shall be rectilinear, except where existing obstructions prohibit this shape.

Surface planing shall be accomplished without gouging or tearing of the remaining pavement surface. The Contractor shall make as many passes with the planing machine as necessary to remove the surface. Surface planing shall include the grinding of all dissimilar material.

The interface between the surface planed area and the concrete gutter pan shall be cleaned of all old asphalt and maintained to provide a smooth, straight, and vertical surface.

Following the final pass, the planed surface shall be within a tolerance of 1/4 inch when checked with a 10 foot straightedge.

The Contractor shall be responsible for location and protection of all manholes, valve boxes, and all other appurtenances, some of which may be below the surface of the street, and to protect equipment from the danger of striking same. Claims for any and all damages arising from hitting these appurtenances shall be the Contractor's responsibility. The Contractor shall have access to applicable records; however, the Contractor shall not rely upon these records to reveal all such hidden appurtenances.

The Contractor shall be held responsible for all appurtenances in the pavement surface which have been damaged or disturbed by the Contractor. The cost of repairing or replacing these damaged appurtenances shall be made at the Contractor's expense.

The Contractor shall remove all pavement cuttings which result from the performance of this Work and deliver them to locations approved by the Engineer.

BASIS OF PAYMENT

When called for in the proposal, the cost of operating the surface planer and the cost of collecting and hauling the pavement cuttings shall be paid for at the contract unit price per hour for each piece of equipment during the time that it is in use. Cleaning required subsequent to the initial removal of the cuttings shall be as provided in Paragraph A above.

When called for in the proposal, SURFACE PLANING, completed in conformance with the plans and Specifications and accepted by the Engineer, shall be measured and paid for at the contract unit price bid per square yard. Such payment shall be full compensation for all surface preparation, planing, removal of materials, labor, tools, equipment, clean up and incidentals necessary to complete the Work.

C. CORRECTION OF PAVEMENT FAILURES

After the surface planing and cleaning have been accomplished, the Engineer shall examine the pavement structure to which the asphaltic concrete is to be applied. Any pavement failures shall be repaired as designated by the Engineer.

BASIS OF PAYMENT

The cost of repairing pavement failures shall be measured and paid for at the appropriate unit prices or shall be accomplished as an Extra Work Item.

D. TACKING

This Work shall consist of the application of asphaltic materials to previously prepared bases or existing surfaces.

After the surface is completely cleaned and dry it shall have a tack coat of rapid curing cut-back asphalt or emulsified asphalt applied sufficiently in advance of the laying operation to break or cure prior to the application of the surface coat.

Traffic shall not be permitted on the tack coat without the permission of the Engineer, and the asphalt surface course shall be applied as soon as the tack breaks and the water has evaporated. The rate of application generally should be from 0.05 to 0.2 gallons per square yard, with the rate of application to be approved by the Engineer. Tack or asphaltic cement shall be applied by hand to all vertical edges.

The cost of supplying and applying tack coat will not be measured for payment. It shall be considered subsidiary for other items to which direct payment is made.

E. NON-WOVEN PAVEMENT OVERLAY FABRIC

Non-woven pavement overlay fabric and asphaltic cement sealant shall be placed at locations called for on the plans. This Work shall consist of the application of an asphalt sealant and the placement of a non-woven pavement overlay fabric over the entire prepared surface of the pavement to be surfaced or resurfaced with asphalt. Sealants are applied both to seal the existing surface and to provide a cement to adhere to the fabric. Emulsified asphalts are not acceptable for sealant.

Sealant and fabric shall be placed only when the ambient air temperature is 50°F or above. The pavement surface on which the sealant fabric is to be placed shall be dry and free of dirt, debris and other foreign matter. Joint and crack openings of 1/8 inch and larger shall be filled with a suitable material as directed by the Engineer. The asphalt sealant shall be applied with distributor equipment at a rate of 0.25 to 0.30 gallons per square yard. The width of the asphalt sealant application shall be the fabric width plus 2 to 6 inches or the entire width of the pavement to be surfaced.

Temperature of the sealant shall be not less than 280°F at the time of application to ensure a uniform spray pattern.

No drilling or skipping shall be permitted. Asphalt drools or spills shall be cleaned from the pavement surface to avoid flushing and possible fabric movement at these asphalt rich areas. Fabric lay-down equipment shall be used for placement of the fabric. Overlap of fabric joints shall be 1 to 3 inches.

Immediately after the placement, the fabric shall be embedded into the asphalt cement sealant with a pneumatic roller, unless otherwise directed by the Engineer. The construction of the asphaltic concrete overlay shall follow closely the placement of the fabric. In the event the sealant bleeds through the fabric before the overlay is placed, the Contractor shall be required to spread a thin layer of sand or asphaltic concrete over the affected areas in order to prevent the fabric from being picked up by the construction equipment. The application of tack coat will not be required on the fabric prior to the placement of the asphaltic concrete unless a delay in the placement of the overlay results in the fabric becoming dry or dirty.

5.05 HAULING AND SPREADING ASPHALTIC CONCRETE MIXTURES

A. HAULING

Clean trucks fully fueled shall be weighed in the morning when starting up and then again in the early afternoon to obtain accurate tare weights. The Engineer may also require re-weighing at any time to obtain new tare weights.

B. SPREADING

Asphaltic concrete used in the construction of sections having a uniform width as shown in the typical cross section of the plans, shall be spread and finished with an approved mechanical spreading and finishing machine. The operation of placing mixtures shall be continuous, as nearly as possible.

The asphaltic concrete mixture shall be dumped in the center of the hopper of the spreading machine. Care shall be exercised to avoid overloading and slopping over of the mixture on the base, pavement, or previously laid asphaltic concrete. The operating speed and depth of strike-off of the spreading and finishing machine shall be regulated so as to produce a well knit, uniform layer of the required compacted thickness.

The asphaltic concrete mixture shall be laid only upon a surface which is dry and free from frost.

When the asphaltic concrete mixture is placed in irregular or narrow sections, intersections, or other areas where it is impractical to spread and finish the mixture by methods previously specified, the Contractor may use other equipment or acceptable hand methods for spreading the mixtures, as approved by the Engineer.

The cost of hauling and spreading the asphaltic concrete mixture shall be considered subsidiary to other items for which payment is made.

5.06 COMPACTING AND FINISHING ASPHALTIC CONCRETE MIXTURES

A. ROLLING

Immediately after spreading, the mixture shall be compacted thoroughly by rolling. The number, weight, types of rollers, sequence of rolling operations and compaction procedures shall be such that the required density and a satisfactory surface are attained consistently while the mixture is in a workable condition.

The initial rolling shall begin as soon as the material will bear the weight of the roller without displacing the material. The final compaction and finishing shall be performed by rollers while the material is still warm and responds to the action of the roller. Rolling shall not be carried on in such a manner or at such a time as will cause shoving or cracking. No additional rolling or compaction will be allowed after the asphalt has cooled beyond 150° F (121° C).

The asphaltic concrete shall be compacted such that the completed surface is slightly above the surface of the concrete at the gutter pan joint and shall be smooth, true and conform to the grade, cross section and contour required without any irregularities that exceed 1/8 inch when tested with a 10 foot straightedge.

All areas not accessible to the equipment specified shall be compacted and finished by other equipment and methods that will provide a satisfactory surface and the specified density. Any areas determined by the Engineer to be defective, shall be immediately reworked to the satisfaction of the Engineer.

B. JOINTING

Longitudinal and transverse joints shall be made in such a manner that well bonded and sealed joints are achieved. Joints between old and new pavement shall be made in such a manner as to insure a thorough and continuous bond between the old and new surface

Cold joints shall be painted with a light application of asphalt cement before the adjacent material is placed. When placing surface course, a hot joint between lane placement shall be maintained as directed by the Engineer.

Joints in the surface course shall be formed by any approved method that will produce a dense vertical joint; otherwise the previously laid surface course shall be cut back to its full depth so as to expose a fresh surface, after which the hot mixture shall be placed in contact with it and raked to proper depth and grade.

No measurement or direct payment shall be made for the operations of rolling and jointing asphaltic concrete pavement. The cost thereof shall be considered subsidiary to other items for which direct payment is made.

C. DENSITY AND DENSITY SAMPLES

1. General

During the construction of asphaltic concrete pavement, the Contractor shall obtain core samples from each pavement lift for the determination of density. These samples shall be taken not later than seven (7) days after the date of placement of the asphaltic concrete at locations designated by the Engineer and shall be delivered to the Owner's Testing Lab or given to the Project Observer immediately after removal from the pavement. The samples shall be taken by drilling with a minimum 4 inch diameter core drill. After removal from the pavement, the cores shall not be sawed, trimmed, or modified by the Contractor in any way so that the actual lift thickness may be determined by the Engineer. The surfaces from which the samples have been taken shall be restored by the Contractor with hot asphaltic concrete mixture on the next succeeding date of plant operation but not later than seven (7) days after placement. Density samples shall be tested in accordance with the Nebraska Standard Method of Tests for specific gravity of compressed bituminous mixtures, NDR T 166. The void-less density for each lot sample shall be tested in accordance with the Nebraska Standard method of test for Maximum Specific Gravity of Bituminous Paving Mixtures, NDR T 209.

A minimum of one sample shall be required for each lot of asphaltic concrete. A lot is defined as each 500 tons or fraction thereof of each day's production. The location of each of the required samples shall be determined by the Engineer. The % of Payment for each lot of asphaltic concrete shall be in accordance with Table "A" of this Section. The % of Payment in Table "A" shall be reduced by 5% for any lot represented by initial density samples received by the Owner's Testing Lab more than (7) days from date of placement.

2. Arterial Streets

The asphaltic concrete for arterial streets shall be compacted to a density of not less than ninety-two and one half percent (92.5%) of the void-less density for that mixture. If any density test result indicates a compaction value of less than ninety-two and one half percent (92.5%) of the void-less density, two additional check cores will be obtained from that lot by the Contractor at points designated by the Engineer not later than 14 days after date of placement and delivered to the Owner's Testing Lab or given to the Project Observer immediately after removal from the pavement as described above. The % of Payment in Table "A" shall be reduced by 5% for any lot represented by check cores received more than (14) days from date of placement. The average density of the three samples shall be considered the density of the lot. In the event a sample is obviously damaged, an alternate sample will be obtained within 3 feet of the location of the damaged sample.

Reduction in payment for each lot of asphaltic concrete will be made according to the following table:

TABLE 'A'

Average Density	Min. # Samples	% of Payment
92.5 and above	1	100
92.0 to 92.4	3	95

91.5 to 91.9	3	90
91.0 to 91.4	3	85
90.5 to 90.9	3	80
90.0 to 90.4	3	70
89.9 or less	3	40 or reject

Where removal is required, no payment will be made for the asphalt concrete surfacing ordered removed or the cost associated with the removal thereof.

The thickness of the samples shall be the average of four measurements made at four equally spaced locations on the perimeter of the sample. When the nominal layer thickness is either less than 1 inch or less than one and a half times the nominal maximum size of the aggregate contained in the asphaltic concrete mixture, the sampling and testing of density for this layer shall be waived. When the nominal thickness of a layer is greater than 1 inch and also equal to or greater than one and a half times the nominal maximum size of aggregate contained in the asphaltic concrete mixture, the thickness of the density sample or samples shall also equal or exceed these thickness requirements. Density determinations shall be waived for any lot when the maximum thickness requirements are not met by any of three samples taken at random.

3. Non Arterial Streets and Parking Areas

The general requirement for Density and Density Samples shall be the same as that for Arterial Streets.

Where removal is required, no payment will be made for the asphalt concrete surfacing ordered removed or the cost associated with the removal thereof.

No measurement or direct payment shall be made for obtaining core samples for the determination of the density pay factor and layer thickness and restoring the surface. Obtaining core samples and restoring the surface shall be considered subsidiary to the items for which direct payment is provided.

D. ASPHALTIC CONCRETE CURB

When called for on the plans, asphaltic concrete curb shall be constructed of a mix approved by the Engineer, or as shown on the plans. The asphaltic concrete shall conform to the shape and dimensions that are shown on the plans.

Whenever possible the asphaltic concrete curb shall be shaped and compacted with a curb machine capable of constructing the curb true to line, grade, and cross section and to a density and with a surface texture which is satisfactory to the Engineer.

Special precautions shall be taken to provide a proper bond between the surface course and the curb. The surface shall be thoroughly cleaned and tacked with hot asphalt cement. If performed during cool weather, surface course shall be heated so that it is sufficiently plastic to form a bond with the hot asphaltic concrete curb.

E. COLD WEATHER PLACEMENT

When weather conditions are expected to adversely affect the temperature of the Asphaltic Concrete during placement and compaction, all haul trucks shall be covered and insulated as directed by the Engineer.

The temperature of the Asphaltic Concrete during placement shall be such that compaction is accomplished within the temperature range as specified by the Asphalt Binder supplier for the grade of binder being used.

Asphaltic Concrete shall not be placed when the ambient temperature during placement is expected to fall below 35°F, without permission from the Engineer.

Asphaltic concrete shall not be placed on frozen or frost covered subgrade or base. Table 'B' shall be used by the Engineer to restrict the routine placement of asphaltic concrete as a result of cold temperatures. Wind velocity, cloud cover, and other project specific conditions will be considered by the Engineer if deviating from Table 'B'.

TABLE 'B'

Lift Thickness	Minimum Surface Temperature
Less than 2 inches	45°F
2 to 3 inches	37°F
Greater than 3 inches	35°F

5.07 BASIS OF PAYMENT

A. NON-WOVEN PAVEMENT OVERLAY FABRIC

Placement of the non-woven pavement overlay fabric shall be measured and paid for at the contract unit price bid per square yard for the item NON-WOVEN PAVEMENT OVERLAY FABRIC. Such payment shall be full compensation for cleaning and preparing the pavement surface, filling joint and crack openings; for furnishing, heating, and applying the asphalt sealant; for placement and rolling of the fabric; for furnishing and applying material for blotting the surface of the fabric as required; and for all equipment, labor, tools, and incidentals required to complete the Work.

B. ASPHALTIC CONCRETE SURFACE COURSE

The asphaltic concrete surface course used in construction of new pavements, wedge course, or overlay, constructed in conformance with these Special Provisions and accepted by the Engineer, shall be measured and paid for on a lot basis at the

appropriate contract unit price bid per ton for the pay item "Asphaltic Concrete Surface Course, Type __". The amount of asphaltic concrete to be paid for shall be the net weight of the material actually incorporated into the work and shall be subject to the requirements of Section 5.06.C of these Special Provisions. Such payment shall be full compensation for all material, binder, labor, equipment, tools, mixing, hauling, tack coats, spreading, compacting to required density, and incidentals necessary to construct the asphaltic concrete surface course to the thickness designated on the plan or as directed by the Engineer.

CHAPTER 11

PORTLAND CEMENT CONCRETE

11.00 GENERAL

Portland Cement Concrete (PCC) shall consist of an intimate mixture of Portland Cement, aggregate, water and an air-entraining admixture. Portland Cement used in all concrete mixtures except L-5500 and PR shall be modified with Class F Fly Ash as described below and as indicated in Table 11.02. Depending on the application, other constituents or admixtures may be used with permission from the Engineer. Materials not on the latest edition of the Nebraska Department of Roads (NDOR) "Approved Products List" shall not be used without permission from the Engineer. The constituents of Portland Cement Concrete and their mixing, handling, and proportioning shall conform to ASTM Designation C 94 except as modified herein.

11.01 MATERIALS

A. CEMENT

Portland Cement shall be a recognized standard hydraulic cement composed primarily of hydraulic calcium silicates conforming to the requirements of ASTM Designation C 150 for Type I, II, or III cement and shall contain no more than 0.60 percent equivalent alkali. Equivalent alkali is defined as the sum of the sodium oxide (Na_2O) and the potassium oxide (K_2O) calculated as sodium oxide (equivalent alkali as $Na_2O = Na_2O + 0.658(K_2O)$). Certified mill tests shall be furnished to the Engineer. Different brands of cement, or the same brand from different mills, shall not be mixed during storage. Neither shall they be used alternately in any one concrete placement without permission from the Engineer. Contractors or Subcontractors supplying concrete shall notify the Engineer when changing to different cement.

The cement shall be protected from damage due to moisture. Cement so damaged will be rejected. Cement shall not be in storage at the concrete plant longer than ninety (90) days without retesting. The temperature of the cement when used shall be less than 180°F.

B. FLY ASH MODIFIED PORTLAND CEMENT CONCRETE (PCC)

Portland Cement Concrete (PCC) mixes for pavement, driveways, curb, median, and sidewalk shall be modified by the use of Type IPF cement, as specified below. Type IPF cement shall be Portland cement which is pre-blended or inter-ground by the cement manufacturer with 25 +/- 2 percent Class F fly ash and shall conform to the requirements of ASTM C 595. No additional fly ash may be added at the concrete plant.

B. FLY ASH MODIFIED PORTLAND CEMENT CONCRETE (PCC) (Continued)

An NDOR approved water-reducing admixture shall be used in all fly ash modified concrete mixes at the dosage rate recommended by the manufacturer. The water-cement ratio of all fly ash modified concrete shall not exceed the maximum limit for the various classes of concrete as shown in Table 11.02.

Fly ash shall conform to the requirements of Class F pozzolan of ASTM Designation C 618, except that the maximum loss on ignition for Class F pozzolan shall be six percent (6.0%). Additionally, Class F pozzolans shall have a maximum allowable free carbon content not to exceed three percent (3.0%). Class F fly ash shall not contain more than one and five-tenths percent (1.50%) of available alkalies as Na_2O. Fly ash such as is produced in furnace operations utilizing liming materials or soda ash (sodium carbonate) as an additive will not be acceptable. Certified mill tests shall be provided to the Engineer.

Only brands of Type IPF Cement which are on the latest edition of the Nebraska Department of Roads Approved Products List shall be approved for use in concrete in City of Lincoln projects.

Type IPF cement shall not be used in mix designations LB-2750, LB-3500, L-5500 and PR without permission from the Engineer.

TABLE 11.02 - PORTLAND CEMENT CONCRETE MIXTURES (CUBIC YARD BATCH)

CLASS OF CONCRETE (1)	GENERAL USE	CEMENT (lb/cy)	CEMENT TYPE (2)	WATER CEMENT RATIO (MAX.)	SLUMP (MAX.) (inches) (3)	AGGREGATES (% BY WEIGHT)		AIR CONTENT RANGE (% BY VOLUME)	28 DAY STRENGTH MIN. PSI
						FINE	COARSE		
SG-3000	Where Specified	564	1PF	0.50	4.0	100	0	6.0 - 8.5	3000
L-3500	Pavement, Sidewalk, Structures	564	1PF	0.50	4.0	70 +/- 3	30 +/- 3	6.0 - 8.5	3500
L-3500S	Slip-form Pavement	564	1PF	0.48	2.5	70 +/- 3	30 +/- 3	7.0 - 10.0	3500
LC-3500	Machine Curb	564	1PF	0.48	2.5	70 +/- 3	30 +/- 3	6.0 - 8.5	3500
L-4500	Structures	658	1PF	0.42	4.0	70 +/- 3	30 +/- 3	6.0 - 8.5	4000
LB-2750	Pavement Base (New Construction Residential)	423	I/II	0.60	4.0	60 +/- 2	40 +/- 2	5.5 - 7.5	2750
LB-3500	Pavement Base (Reconstruction)	564	I/II	0.50	4.0	70 +/- 3	30 +/- 3	5.5 - 7.5	3500
L-5500	Pavement (High/Early Strength)	752	I/II	0.40	4.0	70 +/- 3	30 +/- 3	6.0 - 8.5	4000
PR (4)	Pavement Repair (High/Early Strength)	799	III	0.45	4.0	70 +/- 3	30 +/- 3	6.0 - 8.5	4000

NOTES:
(1) All mixtures shall contain a NDOR approved water reducer at the manufacturer's recommended dosage rate.
(2) For Temporary Pavement, Type I/II cement is allowed.
(3) The maximum slump may be exceeded by use of water reducer, high range water reducer, or both.
(4) Calcium Chloride may be added as per NDOR Standard Specifications for Highway Construction.
This table is for proportion ranges only. Actual mix design weights for specific applications will be provided by the City of Lincoln Materials Testing Laboratory.

CITY OF LINCOLN, NEBRASKA, STANDARD SPECIFICATIONS

CHAPTER 12

ASPHALTIC CONCRETE

ARTICLE	TITLE
12.00	General
12.01	Related Items Specified Elsewhere
12.02	Materials A. Asphalt Binder B. Tack Coats C. Mineral Aggregates
12.03	Asphaltic Concrete Mixtures A. General B. Volumetric Mix Design C. Materials Sampling and Testing D. Mix Design Criteria E. Aggregate Criteria
12.04	Equipment A. General B. Mixing Plant C. Truck Scales

TABLES	TITLE
12.00	Asphaltic Concrete Mix Requirements Summary
12.01	Gyratory Compaction Effort
12.02	Compaction Criteria
12.03	Voids in Mineral Aggregate
12.04	Voids Filled With Asphalt
12.05	Aggregate Adjustment Tolerance
12.06	Coarse Aggregate Angularity
12.07	Fine Aggregate Angularity
12.08	Flat and Elongated Particles
12.09	Clay Content
12.10	Gradation Control Points for 0.375 Nominal Size
12.11	Gradation Control Points for 0.500 Nominal Size
12.12	Gradation Control Points for 0.750 Nominal Size
12.13	Gradation Control Points for SPR

CHAPTER 12

ASPHALTIC CONCRETE

12.00 GENERAL

Asphaltic Concrete mixtures shall be classified as Type 1 (for use in arterial streets), Type 2 (for use in Non-Arterial streets and parking lots), Type 1P (for use in arterial street patching and temporary pavement) and Type 2P (for use in non-arterial street patching, temporary pavement, and parking lot patching) and shall consist of an intimate mixture of naturally occurring mineral aggregates of required gradations and asphalt binder content as hereinafter specified. A summary of the general requirements and uses for the various mix types is shown in Table 12.00 of these specifications. Unless otherwise specified, neither industrial nor manufacturing byproducts will be allowed in the mixture. Reclaimed Asphalt Pavement (RAP) shall be allowed as described later in these specifications. Asphaltic concrete shall be measured and paid for as provided in Chapters 1 and 5 of these Specifications.

12.01 RELATED ITEMS SPECIFIED ELSEWHERE

Chapter 1 - Pavement Construction & Reconstruction
Chapter 2 - Earthwork
Chapter 4 - Portland Cement Concrete (PCC) Base
Chapter 5 - Asphaltic Concrete Construction

12.02 MATERIALS

A. ASPHALT BINDER

The suppliers for asphalt binder used in City of Lincoln projects shall be certified by the Nebraska Department of Roads (NDOR) to supply Performance Graded Binder in Nebraska.

The asphalt binder for all mixes shall conform to the requirements of AASHTO M 320 for Performance Graded Asphalt Binder and must meet all requirements for use on NDOR projects. The PG Binder shall meet or exceed both the upper and lower temperature targets of the PG Binder grades as shown in Table 12.00 of these specifications unless directed otherwise by the Engineer.

In addition, unless for Patching or otherwise specified or directed by the Engineer, the PG Binder shall be a binder which incorporates a blend of base asphalt and elastomer modifiers of styrene-butadiene (SB), styrene-butadiene-styrene (SBS) or styrene-butadiene-ruber (SBR).

The composite material shall be thoroughly blended at the asphalt refinery or terminal prior to being loaded into the transport vehicle. The polymer modified binder shall be heat and storage stable and shall not separate when handled and stored per the suppliers storage and handling recommendations.

12.02 MATERIALS (Continued)

A. ASPHALT BINDER (Continued)

A Material Certification from the PG Binder Supplier shall be submitted prior to construction, stating the recommended mixing and compaction temperatures for the Hot Mix Asphalt. The Material Certification must state that acid has not been used. The Material Certification must also state that the material has not been air blown or oxidized.

When moisture susceptibility testing indicates the need for an anti-stripping additive, it shall be added by the PG Binder Supplier. The Contractor shall be compensated for the cost of the anti-stripping additive at the invoice price of the additive. The bill of lading or delivery ticket shall state the binder grade, specific gravity, and the percentage of anti-strip additive.

B. TACK COATS

1. Rapid-Curing Cut-Back Asphalts

The rapid-curing cut-back asphalts to be used as tack coats shall conform to the requirements of AASHTO M 81, Cut-Back Asphalt (Rapid-Curing Type).

This Specification covers liquid petroleum products, produced by fluxing an asphaltic base with suitable petroleum distillates.

2. Emulsified Asphalts

Emulsified asphalts shall conform to the following Specifications:

ASTM Designation D 977	-	Standard Spec. for Emulsified Asphalts
ASTM Designation D 2397	-	Standard Spec. for Cationic Emulsified Asphalts
ASTM Designation D 140	-	Standard Practice for Sampling Bituminous Materials
ASTM Designation D 244	-	Standard Testing Emulsified Asphalts

Emulsified asphalts covered by these Specifications shall be diluted in the distributor with sufficient potable water to reduce the asphalt residue in the mixture to approximately thirty percent (30%). Emulsified asphalt shall be homogeneous within the thirty (30) days after delivery. If separation of the emulsified asphalt has not been caused by freezing, thorough mixing shall be used to achieve a homogeneous mixture.

C. MINERAL AGGREGATES

1. General

Mineral aggregates for asphaltic concrete shall conform to the following requirements except where modified herein:

ASTM Designation D 692	-	Standard Specification for Coarse Aggregate for Bituminous Paving Mixture
ASTM Designation D 1073	-	Standard Specification for Fine Aggregate for Bituminous Paving Mixture
ASTM Designation D 242	-	Standard Specification for Mineral Filler for Bituminous Paving Mixture

12.02 MATERIALS (Continued)

C. MINERAL AGGREGATES (Continued)

1. General (Continued)

Mineral aggregates shall be crushed rock, broken stone, gravel, sand-gravel, coarse sand, fine sand or a mixture of these materials composed of clean, hard, durable, and non-coated particles, free from injurious quantities of clay, dust, soft or flaky particles, loams, shale, alkali, organic matter, or other deleterious material. Crushed rock shall be crushed limestone, granite, quartzite, or other ledge rock approved for the intended purpose by the City and shall not contain deleterious substances in a quantity exceeding three and one-half percent (3.5%) of any combination of shale, clay lumps, coal, or soft particles with shale and clay lumps not to exceed one and one-half percent (1.5%).

The absorption of water by crushed rock for use in asphaltic concrete shall not exceed three and two-tenths percent (3.2%) by weight. The gradations from any one source shall be reasonably uniform.

The mineral aggregate from different sources of supply shall not be mixed or stored in the same pile, nor used alternately in the same class of construction or mixed without permission from the Engineer. All fractions of a crushed rock gradation shall be produced from the same type of material.

The chemical and physical characteristics of the fraction passing the # 4 sieve shall be substantially the same as those of the material which may be produced in the laboratory from the fraction which is retained on the # 4 sieve.

Mineral aggregates shall have a soundness loss of not more than 12 percent by weight at the end of 5 cycles using sodium sulfate solution.

The mineral aggregate may be tested prior to its use. Generally only mineral aggregates that have been used for similar Work and have satisfactory service records will be approved. If, in the opinion of the Engineer, the mineral aggregate warrants further testing, the sampling and testing will conform to the following requirements:

ASTM C 127	-	Specific Gravity & Absorption of Coarse Aggregates
ASTM D 75	-	Standard Practice for Sampling Aggregates
ASTM C 136	-	Standard Test Method for Sieve Analysis of Fine & Coarse Aggregates
ASTM D 546	-	Standard Test Method for Sieve Analysis of Mineral Filler for Bituminous Paving Mixtures
ASTM C 128	-	Specific Gravity & Absorption of Fine Aggregates
ASTM C 131	-	Standard Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion Impact in the Los Angeles Machine
ASTM C 88	-	Standard Test Method for Soundness of Aggregate
ASTM D 693	-	Standard Spec. for Crushed Aggregate for Macadam Pavements

12.02 MATERIALS (Continued)

C. MINERAL AGGREGATES (Continued)

2. Mineral Fillers

Mineral filler shall consist of pulverized soil, pulverized crushed rock, broken stone, gravel, sand-gravel, sand, or a mixture of these materials that conforms to the following requirements:

Total Percent Passing:	Minimum	Maximum
# 50 (300 μm) Sieve	95	100
# 200 (75 μm) Sieve	80	100
Plasticity Index [material passing #200 (75 μm)]	0	3
Plasticity Index for Soil	0	6

12.03 ASPHALTIC CONCRETE MIXTURES

A. GENERAL

Asphaltic concrete for Type 1 and Type 2 mixtures shall be designed by the Contractor, according to the Asphalt Institute Superpave Mix Design Series No. 2 (SP-2), to meet the Mix Design Criteria for the appropriate mix types as shown in these specifications.

Asphaltic concrete for Type 1P and Type 2P shall be approved by the Engineer prior to use.

The Contractor will be required to define properties using a gyratory compactor that has met the Superpave evaluation test procedures, according to the gyration levels indicated in Table 12.01 for the mix type specified.

Unless otherwise specified or approved by the Engineer, Asphaltic Concrete for Type 1 Mix shall meet or exceed all of the requirements for Asphaltic Concrete type "SP4" as described in these specifications.

Unless otherwise specified or approved by the Engineer, Asphaltic Concrete for Type 2 Mix shall meet or exceed all of the requirements for Asphaltic Concrete type SPR as described in these specifications.

Unless otherwise specified or approved by the Engineer, the Blended Aggregate for Type 1 Mix shall contain no more than 80 percent limestone and shall meet the requirements of Table 12.11, Gradation Control Points For 0.500 (½) Inch Nominal Size.

Unless otherwise specified or approved by the Engineer, the Blended Aggregate for Type 2 Mix shall contain no more than 80 percent limestone and shall meet the requirements of Table 12.13, Gradation Control Points For SPR.

12.03 ASPHALTIC CONCRETE MIXTURES (Continued)

A. GENERAL (Continued)

Table 12.00
ASPHALTIC CONCRETE MIX REQUIREMENTS SUMMARY

TYPE (USE)	AC GRADE	AGGREGATE BLEND		MIX REQUIREMENTS
		% RAP (MAX.)	GRADATION REQUIREMENTS	
1 (ARTERIAL STREETS)	** PG 70-28	25%	½" BAND SUPERPAVE	SP4 (SUPERPAVE)
2 (NON-ARTERIAL STREETS AND PARKING LOTS)	** PG 58-34	35%	SPR BAND SUPERPAVE	SPR (SUPERPAVE)
* 1P (ARTERIAL PATCHING AND TEMPORARY PAVEMENT)	PG 64-22	25%	NOM. MAX. SIZE ½" - #200 SIEVE 10% MAX. LIMESTONE 30% MIN. 80% MAX. *** CRUSHED 85% MIN.	**** 5% TO 6% AC BY WEIGHT OF MIX
* 2P (NON-ARTERIAL PATCHING AND TEMPORARY PAVEMENTAND PARKING LOT PATCHING)	PG 58-28	35%		

* Types 1P and 2P mixtures must be approved by the Engineer prior to use.
** Indicates polymer modification as specified in 12.02 MATERIALS, A. ASPHALT BINDER.
*** Indicates aggregates crushed by mechanical methods.
**** Amount of AC in RAP to be determined by the Contractor prior to production.

B. VOLUMETRIC MIX DESIGN

The mix formula shall be determined by the Contractor from a mix design for each mixture. A volumetric mixture design in accordance with the latest edition of the Asphalt Institute Publication, SP-2 will be required. However, the mixture for the Superpave specimens and maximum specific gravity mixture shall be short-term aged for two hours. The following test procedures shall apply:

AASHTO R 30	-	Practice for Short and Long-Term aging of Hot Mix Asphalt
AASHTO T 84	-	Specific Gravity and Absorption of Fine Aggregate
AASHTO T 85	-	Specific Gravity and Absorption of Coarse Aggregate
AASHTO PP 19	-	Practice for Volumetric Analysis of Compacted Hot Mix Asphalt
AASHTO T 312	-	Method for Preparing and Determining the Density of Hot Mix Asphalt Specimens by Means of the Superpave Gyratory Compactor
AASHTO T 209	-	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
AASHTO T 283	-	Resistance of Compacted Bituminous Mixture to Moisture induced Damage

The optimum binder content shall be the binder content that produces required air voids, at Ndes, in the plant produced mix. The design shall have at least four points, including a minimum of two points above and one point below the optimum. The amount of un-compacted mixture shall be determined in accordance with AASHTO T 209.

Each Superpave mixture shall be tested by the Contractor for moisture susceptibility in accordance with AASHTO T 283. The loose mixture shall be short-term aged for two hours in accordance with AASHTO R30. The 6-inch specimens shall be compacted in accordance with AASHTO T 312 to 7 percent air voids at 95-mm in height and evaluated to determine if the minimum Tensile Strength Ratio (TSR) of 80 percent has been met. If the mixture has not met the minimum TSR value, the Contractor shall have the option of modifying the mixture, as approved by the Engineer, and retesting to verify that the minimum TSR of 80 percent has been achieved or by having a NDOR approved liquid anti-stripping additive added to the PG Binder, by the PG Binder Supplier, at a dosage rate, such that the mix will meet the minimum TSR of 80 percent.

All data shall be submitted with the mix design for approval. During production, the Contractor may be required by the Engineer, to provide and test additional specimens of the plant produced asphaltic concrete for moisture susceptibility. A TSR test result of less than 80 percent will require mixture modification(s) and a sample from subsequent lots will be tested by the Contractor until a TSR value of at least 80 percent is achieved.

Changes in the types or sources of aggregates or binder shall require a new job mix formula, mix design, and moisture susceptibility test. The new proposed job mix formula shall be in accordance with the requirements as stated above and submitted 5 working days prior to use for approval.

C. MATERIALS SAMPLING AND TESTING

At the beginning of each year and at least 14 days before production of asphaltic concrete, the Contractor shall submit, in writing, a tentative job mix formula and material samples as described below, for approval, to the City of Lincoln Materials Testing Laboratory. The job mix formula shall identify the mineral aggregates and mineral filler, if needed, with the value of the percent passing each specified sieve for the individual and blended materials.

A 65 pound bag of each of the individual mineral aggregates and RAP, if used, shall also be submitted to the City at this time. Each sample shall be marked to clearly indicate the type of material, name of the producer, and the pit location.

The Contractor shall submit, to the City Testing Lab, three proportioned 10,000-gram samples of the blended aggregates and a 1 gallon sample of the asphalt binder to be used in the mixture. Whenever RAP is used, it shall be processed through an ignition oven and then combined proportionally with the virgin aggregate in one of the 10,000-gram samples. The remaining two 10,000-gram samples shall be made up of the unprocessed RAP combined proportionally with the virgin aggregate. Submitted with these samples shall be a copy of the mix design values obtained from tests performed by the Contractor. This mix design shall include at a minimum, the following information:

- The bulk specific gravity (Gsb) of the blended aggregate (The specific gravity shall be determined for the combined blend from the unwashed portion of the - #4 and the + #4 material in accordance with AASHTO T 84 & T 85 respectively)
- The target asphalt binder content by total mix
- The supplier, grade, and specific gravity of the PG Binder
- The maximum specific gravity of the combined mixture (Rice)
- The average bulk specific gravity and air voids at N initial (Nini), N design (Ndes), and N maximum (Nmax) of the compacted gyratory specimens
- Voids in the Mineral Aggregate (VMA) and Voids filled with Asphalt (VFA) at Ndes
- Fine Aggregate Angularity (FAA), Coarse Aggregate Angularity (CAA), Flat and Elongated Particles and Clay Content of the aggregate blend

During production, asphaltic concrete shall be sampled and tested for quality by the City on a lot basis as defined in Chapter 5.06 paragraph C of these specifications. Tests shall include the following:

AASHTO T 209	-	Maximum specific gravity of the mix (Rice)
ASTM C 136	-	Standard Test Method for Sieve analysis of Fine and Coarse Aggregate
AASHTO T312	-	Method for Preparing and Determining the Density of Hot Mix (HMA) Asphalt Specimens by Means of the Superpave Gyratory Compactor
AASHTO T 166	-	Bulk Specific Gravity of compacted Bituminous Mixtures using saturated surface-dry specimens
		Asphalt binder content of total mix by ignition
		National Center for Asphalt Technology

12.03 ASPHALTIC CONCRETE MIXTURES (Continued)

D. MIX DESIGN CRITERIA

The design criteria for each mixture shall be determined from Tables 12.01, 12.02, 12.03, and 12.04.

The optimum binder content shall be the binder content that produces 4.0% +/- 1% air voids at Ndes for SP4 mixes and 3.0% +/- 1% at Ndes for SPR mixes.

Table 12.01
GYRATORY COMPACTION EFFORT
Average Design High Air Temperature = < 39 degrees C (102° F)

Asphaltic Concrete Type	Nini	Ndes	Nmax
SPR	7	65	100
SP4	8	96	152

Table 12.02
COMPACTION CRITERIA

Mix Criteria	SPR	SP4
%Gmm at Nini		89.0
%Gmm at Ndes	96.0 -98.0	
%Gmm at Nmax		98.0

Table 12.03
VOIDS IN MINERAL AGGREGATE
Criteria at Ndes

Nominal Maximum Aggregate Size	Minimum VMA, Percent
SPR	12.0
½ (0.500) inch	14.0

Table 12.04
VOIDS FILLED WITH ASPHALT
Criteria at Ndes

Asphaltic Concrete Type	Design VFA, Percent
SPR	70 - 80
SP4	65 - 75

D. MIX DESIGN CRITERIA (Continued)

If at the end of the day's production, either of the two following conditions occurs, the Contractor will not be allowed to resume production until corrective adjustments are made to the mix design:

1. Air Voids, VMA, VFA, FAA, CAA or Binder content do not meet the currently approved criteria.

2. Rutting occurs.

Mix adjustments at the plant are authorized within the limits shown in Table 12.05 without redesigning the initially approved mix.

The adjustment must produce a mix with the percent air voids and all other properties as stated in these specifications.

All adjustments must be reported to the Engineer.

The adjustment values in Table 12.05 will be the tolerances allowed for changes indicated by production or mix design test results, but cannot deviate from Superpave gradation criteria.

Table 12.05
AGGREGATE ADJUSTMENT TOLERANCE

Aggregate Adjustments	
Sieve Size	Adjustment Range
1 inch, 3/4 inch, ½ inch, 3/8 inch	± 6%
No. 8, No. 16, No. 30, No. 50	± 4%
No. 200	± 2%

E. AGGREGATE CRITERIA

1. Coarse Aggregate Angularity (CAA)

The coarse aggregate angularity value of the blended aggregate material shall meet or exceed the minimum values for the appropriate asphaltic concrete type shown in Table 12.06.

Table 12.06
COARSE AGGREGATE ANGULARITY
(ASTM D 5821)

Asphaltic Concrete Type	CAA (minimum)
SPR	83
SP4	85/80*

* Denotes two faced crushed requirements

E. AGGREGATE CRITERIA (Continued)

1. Coarse Aggregate Angularity (CAA) (Continued)

Aggregate obtained from the residue of the ignition process shall not be used for the determination of CAA for mix design approval except when RAP material is specified and must be combined with the proportioned amount of virgin aggregate as defined by the mix design.

2. Fine Aggregate Angularity (FAA)

The fine aggregate angularity value of the blended aggregate material shall meet or exceed the minimum values for the appropriate asphaltic concrete type shown in Table 12.07.

The specific gravity for calculation of the FAA shall be based on a combined aggregate sample of material passing the No. 8 sieve and retained on the No. 100 sieve.

Table 12.07
FINE AGGREGATE ANGULARITY
(AASHTO T 304 Method A)

Asphaltic Concrete Type	FAA (minimum)
SPR	43.0
SP4	45.0

Aggregate obtained from the residue of the ignition process shall not be used for the determination of FAA for mix design approval except when RAP material is specified and must be combined with the proportioned amount of virgin aggregate as defined by the mix design.

3. Flat and elongated particles

The coarse aggregate shall not contain flat and elongated particles exceeding the maximum value for the appropriate asphaltic concrete type shown in Table 12.08.

Table 12.08
FLAT AND ELONGATED PARTICLES*
(ASTM D 4791)

Asphaltic Concrete Type	Percent, Maximum
SPR	10
SP4	10

* Criterion based on a 5:1 maximum to minimum ratio

E. AGGREGATE CRITERIA (Continued)

4. Clay Content

The Clay Content of the blended aggregate material shall be such that the Sand Equivalent Minimum value for the appropriate asphaltic concrete type as shown in Table 12.09 shall be met or exceeded.

Table 12.09
CLAY CONTENT
(AASHTO T 176)

Asphaltic Concrete Type	Sand Equivalent, Minimum
SPR	45
SP4	45

5. Gradation

The blended aggregate shall conform to the gradation requirements specified below for the appropriate nominal size.

The dust to binder ratio is the ratio of the percentage by weight of aggregate finer than the No. 200 sieve to the asphalt content expressed as a percent by weight of total mix. The dust to binder ratio shall be between 0.7 and 1.7. This shall be verified during mix design approval and production sample testing.

Table 12.10
GRADATION CONTROL POINTS FOR 0.375 (3/8) INCH NOMINAL SIZE

	Control Points		Restricted Zone Boundary	
	(percent passing)		(percent passing)	
Sieve	Minimum	Maximum	Minimum	Maximum
½ inch	100.0			
3/8 inch	90.0	100.0		
No. 4		90.0		
No. 8	32.0	67.0	47.2	47.2
No. 16			31.6	37.6
No. 30			23.5	27.5
No. 50			18.7	18.7
No. 200	2.0	10.0		

12.03 ASPHALTIC CONCRETE MIXTURES (Continued)

E. AGGREGATE CRITERIA (Continued)

5. Gradation (Continued)

Table 12.11
GRADATION CONTROL POINTS FOR 0.500 (½) INCH NOMINAL SIZE

	Control Points		Restricted Zone Boundary	
	(percent passing)		(percent passing)	
Sieve	Minimum	Maximum	Minimum	Maximum
3/4 inch	100.0			
½ inch	90.0	100.0		
3/8 inch		90.0		
No. 8	28.0	58.0	39.1	39.1
No. 16			25.6	31.6
No. 30			19.1	23.1
No. 50			15.5	15.5
No. 200	2.0	10.0		

Table 12.12
GRADATION CONTROL POINTS FOR 0.750 (3/4) INCH NOMINAL SIZE

	Control Points		Restricted Zone Boundary	
	(percent passing)		(percent passing)	
Sieve	Minimum	Maximum	Minimum	Maximum
1 inch	100.0			
3/4 inch	90.0	100.0		
½ inch		90.0		
No. 8	23.0	49.0	34.6	34.6
No. 16			22.3	28.3
No. 30			16.7	20.7
No. 50			13.7	13.7
No. 200	2.0	8.0		

12.03 ASPHALTIC CONCRETE MIXTURES (Continued)

E. AGGREGATE CRITERIA (Continued)

5. Gradation (Continued)

Table 12.13
GRADATION CONTROL POINTS FOR SPR

	Control Points (percent passing)	
Sieve	Minimum	Maximum
3/4 inch	100.0	
3/8 inch	81.0	96.0
No. 8	50.0	60.0
No. 50	12.0	21.0
No. 200	4.0	8.0

12.04 EQUIPMENT

A. GENERAL

All equipment, tools and machinery shall be adequate for the purpose for which it is to be used and shall be maintained in satisfactory working condition at all times. The following listed units of equipment shall conform to the requirements specified herein.

The Contractor shall furnish the necessary accessories and personnel and shall perform calibrations on the equipment. Copies of the calibration data shall be provided to the Engineer before production of Asphaltic Concrete. In the event problems are encountered during the calibrations, the Contractor shall arrange for a trained technician or company representative of the company from which the equipment was obtained to make the necessary repairs and/or adjustments to the equipment. Calibrations shall be made as often as is deemed necessary by the Engineer to ensure accuracy of the equipment.

In the event that a Contractor elects to obtain asphaltic concrete from a commercial plant not under his direct control, he shall reach agreement with the commercial producer to perform the above functions in the same manner as though the plant was under his direct control. The Contractor shall also reach agreement with the producer to furnish or shall arrange to have furnished an approved building for the use of an observer if deemed necessary by the Engineer.

12.04 EQUIPMENT (Continued)

B. MIXING PLANT

1. General

The equipment that is used for heating, proportioning, and mixing the aggregates and asphalt cement shall be able to produce a uniform mixture.

The dryers shall be able to dry and heat all aggregates to the required temperatures with positive control. Aggregates shall be agitated continuously during the process of heating. Damage to the asphalt cement in dryer-drum type mixing plants shall be avoided.

Salvaged bituminous material shall not be exposed to open flame.

Continuous temperature and time readings of the asphaltic materials shall be electronically recorded whenever the plant is operated. A copy of the temperature reading shall be made available to the Engineer. Temperature and time displays shall be easily accessible. Temperature and time sensors will be provided at the following locations:

a. Inside the asphaltic concrete mixture discharge chute.
b. Inside the surge bin.
c. Inside the asphalt cement storage tank.

During storage, the asphalt cement temperature shall be maintained between 250F and 350F or at the storage temperature range recommended by the binder supplier. All plants shall be equipped with a circulating system for asphalt cement which is designed to assure proper and continuous circulation during the operating period. Storage tanks shall have sufficient capacity to provide for continuous operation. The tanks shall be situated and constructed to allow the volume of the asphalt cement to be safely and accurately determined at any time.

If the plant is equipped with a surge bin for the temporary storage of asphaltic concrete, the asphaltic concrete taken from the surge bin will not differ significantly form the material taken directly from the plant. The first material entering the bin will be the first material removed. The surge bin shall be completely emptied at the end of each operating day unless insulated or heated.

All plants shall be equipped with a continuously operated dust collector. The collected material may be wasted or returned to the mix.

Mineral filler bins shall be protected from moisture.

2. Pugmill Plants

a. General

Pugmill plants shall include cold aggregate feeders, oversize screens, storage bins for dried aggregate, ingredient proportioning devices, and all other equipment necessary to produce the specified mixture. The pugmill blades shall have a minimum clearance of 3/4 inch from all fixed and moving parts. The mixer shall be equipped with a discharge hopper holding approximately 1 ton of hot mixture and capable of intermittent discharge.

12.04 EQUIPMENT (Continued)

B. MIXING PLANT (Continued)

2. Pugmill Plants (Continued)

b. Batch Plants

Batch plants shall have an accurate time lock to control the operations during a complete mixing cycle. They shall lock the scale box gate after the charging of the mixer until the closing of the mixer gate at the completion of the cycle. They shall lock the bituminous material bucket throughout the dry mixing period and shall lock the mixer gate throughout the dry and wet mixing periods.

The dry mixing period is defined as the time between the opening of the scale box gate and the addition of bituminous material. The wet mixing period is the interval of time between the addition of bituminous material and the opening of the mixer gate.

The control of the timing shall be flexible and capable of being set at 5-second intervals or less throughout a total cycle of not less than 3 minutes. A mechanical batch counter shall be installed as a part of the timing device and shall be designed and constructed to register only upon the release of the bituminous material. It shall not register any dry batches or any material wasted through the bins. The timing device shall have a suitable case with a locking door that shall always be kept closed and locked except when adjustments or repairs are required.

All batch plants shall be equipped with an asphalt cement volume meter or a heated or insulated asphalt bucket with scales.

Scale hoppers and scales for proportioning aggregates and asphalt to the batch plant's mixer shall be accurate within 0.5 percent; and they shall be sensitive within 0.2 percent or 2 pounds, whichever is greater, throughout the range of use.

c. Continuous Type

Plants shall be equipped with a pump synchronized to the feeding mechanism so that the required percentage of asphalt cement is applied continuously and uniformly. The feeding system shall be synchronized to the rest of the plant.

3. Dryer-Drum Plants

These plants shall include cold aggregate feeders, vibratory screening units for removing oversize material from both virgin and reclaimed material, proportioning devices for controlling the quantity of each ingredient in the mixture, and any other equipment necessary to produce the mixture as specified.

Plants shall be equipped with a pump synchronized to the feeding mechanism so that the required percentage of asphalt cement is applied continuously and uniformly. The feeding system shall be synchronized to the rest of the plant.

12.04 EQUIPMENT (Continued)

C. Truck Scales

Truck scales shall be furnished by the Contractor for weighing loaded trucks at the plant site, and shall be installed on adequate foundations and in accordance with the manufacturer's recommendations. The scales shall have sufficient capacity to weigh the maximum axle, combination of axles or gross load used and shall be accurate to one-half percent (0.5%) of the total axle load or total load.

Scales shall be properly calibrated by the Contractor in the presence of the Engineer unless the scales have current Nebraska Department of Agriculture inspection approval or unless calibration and adjustment by a recognized scale company service crew has been performed during the current season, and attested to by a City of Lincoln representative. The scales shall be periodically cross-checked for accuracy during the course of the Work by checking the net weight of loads of the material being produced on commercial scales in the vicinity of the project which have current agriculture inspection approval. The Contractor shall furnish at least ten (10) 50 pound weights for checking the accuracy of the scales. If the scale is not capable of weighing all axles at one time, the approaches shall be extended so the entire hauling unit will be level during weighing. Chuck holes, ruts or high spots in the approaches which develop during hauling operations shall be immediately repaired as directed by the Engineer.

All weighing shall be done with the hauling unit stationary, level, and out of gear. Suitable protection shall be provided against wind currents that may affect the accuracy of the scales. The platform of the scale shall be kept clean and free from accumulations of materials, as directed by the Engineer.

Serially numbered duplicated scale tickets shall be furnished to accompany each truck load of material to the unloading point. Scale tickets shall reflect the date, time, load number, total weight, tare weight, project number, mix type, destination, and net weight.

SPECIAL PROVISIONS AND MODIFICATIONS TO THE LINCOLN STANDARD SPECIFICATIONS

REVISED 4-20-10, YOU MUST REPLACE THIS LINE WITH PROJECT LOCATION

TRAFFIC SIGNAL AND STREET LIGHTING, CHAPTER 24

24.00 GENERAL

B. FURNISHED MATERIALS

The Contractor shall be responsible for all material or equipment furnished by the City from the time that it is picked up to the completion of work. In the event the cabinet is damaged, including, but not limited to, any concrete splatters, dents, scratches or any other damage as noted by the Engineer, the contractor shall re-wire a new cabinet supplied by the City. The cost of damaged materials shall be deducted from the final payment.

E. DOWNTIME FOR TRAFFIC SIGNALS OR STREET LIGHTING

The Contractor shall be responsible for consulting Lincoln Electric System, Mark Heimann, 467-7541 (cel 432-2531) or Marty Weber 467-7557 (cel 430-5878) to have LES energize or de-energize any Street Light Cable or energize Service Cable for Traffic Signal Equipment. Under no circumstance will the contractor open any LES locked facilities, such as a Transformer or Pedestal.

F. ANTI-SEIZE COMPOUND

The Contractor shall use Permatex 80208, Anti-Seize Compound or approved equivalent everywhere metal screws into or onto metal, except anchor bolts.

M. SIGNAL INSPECTION COMPLETION

Upon completion of a fully operational traffic signal (including communication to the signal), a Signal Inspection shall be completed by the City. The Contractor is allowed a defined number of calendar days to complete the following: correct any items as listed on Signal Inspection Form, return Signal Inspection Form back to City, and correct any subsequent deficiencies identified by inspections until City accepts all work. The number of days is as follows:

For a Single Signalized Intersection: 45 calendar days are allowed for the entire Signal Inspection and Correction process. The City is allowed 14 calendar days for the initial inspection and 7 calendar days for each additional inspection needed thereafter.

For more than one signalized intersection: 45 calendar days + 14 calendar days are allowed for each additional intersection for the entire Signal Inspection and Correction process. The City is allowed 14 calendar days + 4 calendar days for each additional intersection for the initial inspection. The City is allowed 7 calendar days + 2 calendar days per additional signal for each additional inspection needed thereafter.

Initial and subsequent City inspections shall be included as part of the calendar days allowed.

If the Contractor has not corrected all items on the Signal Inspection form to the satisfaction of the City and has not received final acceptance from the City within the allotted time, the Contractor shall be assessed liquidated damages of $500 per calendar day until all work is completed and deemed acceptable.

24.07 TRACER WIRE SYSTEM

A. GENERAL

The Contractor shall supply an approved locate stick. It shall be a 5' x 3" triangular flexible orange plastic marker with 5 separate access terminals and set screw to hold terminal concealment cap on. Approved decals shall be placed on all 3 sides with "Warning, Fiber Optic Cable, City of Lincoln, Before digging in this area call Diggers Hotline 800-331-5666", as shown on LSP 81.

The Contractor shall also provide the ground wire, No 14 THHN, green in color in ½" conduit from the locate stick to the fiber pull box ground rod and the 5/8" x 15' ground rod.

A jumper shall be attached to appropriate locate stick lugs to complete a continuous tracer wire run.

B. INSTALLATION

Bend out all 3 barbs towards the bottom of the stick until the tips touch the post to ensure proper alignment. Place the locate stick in the hole and backfill making sure the barbs stay out and dirt falls on top of them. Properly tamp the soil as the hole is backfilled. See LSP 81.

C. BASIS OF PAYMENT

Each Locate Stick, installed, connected and accepted by the Contract Administrator, shall be measured as a single unit and shall be paid for at the contract unit price bid per each for the item. This price and payment shall be full compensation for installing the Locate Stick, 1/2" Conduit and Tracer Wire from the Locate Stick to the pull box, 5/8" x 15' Ground Rod in the pull box, all

connections, jumper and for all labor, equipment, tools, materials, excavation, and incidentals required to complete the Work.

24.08 FOUNDATIONS AND BASES

Foundations and bases shall be constructed and/or installed in accordance with Lincoln Standard Plans (LSPs) LSP 82 and 92, to the elevation supplied by the Engineer.

If the foundation or base cannot be constructed as shown on the plans the Contractor shall contact the Engineer for further instructions and elevations.

All foundations shall be poured within 48 hours of excavation.

B. INSTALLATION

1. Reinforced Concrete

Forms shall be firmly braced and secured in place. Forms shall not be removed until the concrete has set, and at no time shall they be removed within 12 hours after the concrete has been placed.

Prior to pole and cabinet installation, anchor bolts and foundation holes shall be barricaded or suitably enclosed to protect the public from possible injury.

All reinforcement bars for concrete reinforcement shall be Grade 40 or Grade 60 steel and shall conform to the requirements of "Standard Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement", ASTM Designation A 615, or "Standard Specifications for Raw Steel and Axle-Steel Deformed Bars for Concrete Reinforcement", ASTM Designation A 996. Bars shall be free from excess rust, scale or other substances which prevent the bonding of concrete to the reinforcement.

There shall, in all cases, be at least 3" of concrete between anchor bolts and steel reinforcing members at any edge of foundation or base.

No foundation or base shall be poured until they are free of water or debris including trash. The bottom of the foundations and bases shall rest securely on firm undisturbed ground. Both forms and excavations shall be thoroughly wet before placing concrete. An Observer shall be present for the pouring of all traffic signal foundations and bases. The Project Manager shall be contacted 24 hours in advance of the pour. Any foundations poured without the Observer present shall be subject to removal and replacement at the Contractor's expense.

The foundations and bases shall be L3500 concrete, poured monolithically and vibrated with a high-frequency vibrator as it is placed, from the bottom to the top, in the form to eliminate all

voids. No floating of steel allowed. The top and any exposed portion of the foundation or base shall be troweled smooth, true and level.

Anchor bolts shall protrude within the range shown on LSP 82 with the nuts and threads covered to protect them during pouring.

Grinding concrete to form a chamfer shall not be permitted.

After the foundation or base has been poured, no modification shall be made. If the anchor bolts, conduit, or any part of the foundation or base are installed in an incorrect manner, as determined by the Engineer, the entire foundation or base shall be removed and a new foundation or base installed. The Contractor shall bear all costs of replacing work, including cost of anchor bolts, deemed unsatisfactory by the Contract Administrator.

24.09 PULL BOXES

A. GENERAL

Pull boxes, type PB-T6, PB-9, PB-T9 and FOR27 and their cover are required to conform to all test provisions of ANSI/SCTE 77 "Specifications For Underground Enclosure Integrity" Tier 15 and labeled as such inside the pull box and on the top of the cover. All covers are required to have a minimum coefficient of friction of 0.05 in accordance with ASTM C1028. Independent third party verification or test reports stamped by a registered Professional Engineer certifying that all test provisions of this specification have been met are required with each submittal.

Pull box shapes and nominal dimensions shall conform to LSP 81.

Pull box lids shall also be labeled "ELECTRIC", "TRAFFIC", or "FIBER" on top as indicted on the Plans.

B. INSTALLATION

Pull boxes shall be installed at the locations shown on the plans.

Pull boxes, type PB-T6, PB-9, PB-T9 and FOR27 shall rest firmly on a bed of 3/4" washed crushed limestone rock with a minimum depth of 12" below the bottom, extending at least 3" beyond the outside edges of the pull box. Avoid placing these pull boxes in concrete. Do not install Lid Bolts.

Pull box edges, lid and lifting eye shall be kept clear of concrete and foreign material.

Pull Boxes PB-9 or PB-9 deep shall only be used with the Magnetic Vehicle Detector.

C. METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Pull boxes, complete, in place and accepted by the Engineer, will be measured for payment as single units and shall be paid for at the contract unit price bid per each for the item. This price shall be full compensation for all excavation required; for furnishing and installing the pull box; for conduit, conduit stub out, concrete, and crushed rock; and for all labor, equipment, tools, materials, and incidentals required to complete the work.

24.10 CONDUIT

B. INSTALLATION

Conduit shall be installed at a minimum depth of 30", except that conduit designated for "Fiber Optic Cable" shall be installed not less than 42" below finished grade.

F. METHOD OF MEASUREMENT AND BASIS OF PAYMENT

The quantity of conduit or conduit sock to be paid for shall be the number of feet of such material of the size and type required, installed and accepted by the Engineer as measured from center to center of foundations or pull boxes, or from pole to pole if there is no foundation.

Conduit or conduit sock shall be paid for at the contract unit price bid per linear foot for the conduit or conduit sock items. These prices shall be full compensation for all excavation required; for all concrete, backfilling and compacting; and for all labor, equipment, tools, materials, and incidentals required to complete the work.

24.11 CABLE

A. TYPES AND CLASSES OF CABLE

5. Service, Street Lighting, Circuit Grounding Cable and Pole Grounding Wire

The cable for underground circuits and pole grounding shall be single conductor, the size specified on the plans, type XLP USE-2, RHH/RHW-2 600 Volt, Copper Cable. UL 44 and UL 854, ICEA S-95-658/NEMAWC-70, C (UL) US Federal spec. A-A-59544. Pole ground wire shall be bare No. 6 AWG solid copper.

11. Camera Control Cable
Camera Control Cable shall be Commscope Ultra II Cable, part number 5NF4 or approved equivalent.

13. Dynamic Message Sign Cable

Dynamic Message Sign Cable shall be SJOW, No. 10 AWG, 4/c & No. 18 AWG, 3/c. This cable is to be between the dynamic message sign junction box and the dynamic message cabinet.

B. INSTALLATION

Splices are only allowed in the 7/c Left Turn Cable at the pole hand hole. Street Lighting Cable and Circuit Grounding Cable shall be spliced only when a change in size or split of cables is shown on the plan. Tracer wire may be heat shrink spliced in a pull box, to save on wire waste.

2. Overhead Cable

Drip loops shall be provided at all signal hangers, wire inlets, and service entrance heads in conformance with good outdoor wiring methods. They shall be 3" vertically by 6" horizontally, hidden behind signal heads wherever possible.

3. Fiber Optic Cable

a.. Fiber Optic Cable Terminations

ST style connectors shall fit a panel with a double-D cut out diameter of 0.38".

SC style connectors shall fit a panel cut out of 1.024" by 0.375".

Multi-mode boot color shall be ivory tan or black.

Single-mode boot color shall be white or black.

b. OTDR Testing

All Fiber Optic Cable new or relocated shall be tested by the contractor with an Optical Time Domain Reflectometer (OTDR). This test shall be after the terminations are complete if the Contractor is expected to perform the terminations. If the Contractor is not expected to perform the terminations, the test shall be completed after the fiber is pulled in. If the Fiber Optic Cable is provided by the City, an OTDR test shall also be performed prior to installation to insure satisfactory cable. A hard copy of this test shall be provided to the City prior to installing the Fiber Optic Cable.

For Multi-mode Fiber Optic Cable, the maximum attenuation with or without terminations shall be 5.63 db per mile, tested at a wave length of 850 nm and 1300 nm. For Single-mode Fiber Optic Cable the maximum attenuation with or without terminations shall be 5.63 db per mile, test at a wave length of 1310 nm and 1550 nm.

The OTDR test shall be performed in both directions along the link. The direction of the test shall also be recorded in the documentation. A hard copy of the Fiber Optic Test shall be provided to the City.

24.12 CABLE SPLICES AND CONNECTIONS

A. GENERAL

All Traffic Signal splices and Street light splices below grade shall be made for continuous immersion in water.

Cable connections in signal heads or controller cabinets shall be made at the terminal boards provided for this purpose. All stranded wires inserted under a binder head screw shall be equipped with a solderless pressure-type spade connector with a pre-insulated shank. A crimping tool for insulated connectors shall be used. No bare wire shall be exposed.

E. Method of Measurement and Basis of Payment

No measurement or direct payment shall be made for cable connections (except fiber connectors), splices, attachments, materials and incidentals necessary to complete the work in accordance with the plans and Specifications. The work shall be considered subsidiary to and included in the bid price for cable installation.

Fiber Optic Cable terminations shall be paid for complete, tested and accepted by the Engineer, measured for payment as single units. Payment shall be made at the contract unit price bid for the items.

24.13 TRAFFIC SIGNAL, LIGHTING OR TRAFFIC MONITORING POLE

B. INSTALLATION

Poles shafts must be erected so that they are plumb with their entire load in place. The mast arms shall be correctly oriented, as shown on the plans. Plumbing of pole shafts shall be accomplished by adjusting the leveling nuts on the foundation anchor bolts. Shims or similar devices for plumbing or racking will not be permitted except for leveling of the transformer base as per the manufacturer.

After the mast arms orientation and height are verified by the Engineer, the Contractor shall pin the mast arms as soon as possible.

At the Engineers discretion the mast arms shall be oriented parallel to the traveled roadway and later swung into their final orientation. The Contractor shall only rotate the mast arms to the correct orientation upon the direction of the Engineer. When the Contractor is rotating the

mast arms to the final plan orientation, they must loosen bolts so that the mast arm clamp does not bind on the shaft or cause damage to the galvanizing.

If the Engineer calls for the final plan, mast arm, orientation only, then the Contractor shall not be paid for rotating the mast arms.

24.15 GROUND RODS AND GROUND WIRE

A. GENERAL

Ground rods shall be high strength steel rods with chemically-bonded copper coverings to provide high-conductivity and to prevent electrolytic action. The copperweld ground rods shall be placed as shown on the plans, 2' from the pole base, and oriented on the same side as the hand hole or in a pull box, if called for on the plans or LSPs; they shall have a nominal diameter of 5/8" and 15' long, except to a Street Light Pole shall be 10' long. For worker safety 5' lengths of ground rod screwed together are allowed. Ground wires shall be connected to ground rods with one-piece non-ferrous clamps which employ set screws as tightening devices. Connections to ground rods shall not be taped.

24.18 VEHICLE DETECTOR INSTALLATION

B. LOOP DETECTORS

3. Loop Acceptance

Each loop shall be tested at the cabinet by the City prior to termination and acceptance. All tests shall have the following result prior to acceptance.

New Loop = infinity
New Loop and New Feeder Cable = infinity

C. MAGNETIC DETECTORS

The magnetic detector installation shall include the furnishing and installing of a Pull Box, type PB-9, stacked to achieve the needed depth or ordered to the needed depth and the installation of a City furnished magnetic probe complete with the wire leads spliced to the 2/c traffic signal cable that connects to the signal cabinet. The conduits into the bottom of the pull box shall not conflict with the 3" Conduit through the end of the pull box, so that the probe can be inserted into the 3" Conduit. The hole for the 3" Conduit through the side of the pull box shall be just large enough to except the 3" Conduit, no larger. The 3" Conduit through the side of the pull box shall be level the entire length to where the plans show.

The Contractor shall install the magnetic probe for multi-lane approaches under the lane line between two adjacent lanes. Magnetic detectors installed under one approach lane shall be installed under the center of the lane.

E. METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Vehicle detectors, complete, in place, tested, and accepted by the Engineer, shall be measured for payment as single units. Payment shall be made at the contract unit price bid per each for the vehicle detector item. In addition, vehicle detector loops sawed in place or under cover loops placed shall be tested and approved prior to final payment for the traffic signal cabinet.

In the event an UC Loop does not meet requirements or was not placed as per plan, the Contractor shall remove the roadway, place a new UC Loop as per plan and replace roadway, all at Contractors expense.

Any surface to be overlaid shall have loops sawed into the base prior to placement of asphalt. Loops not placed prior to surfacing, shall be sawed into the surfacing without payment to the Contractor.

24.20 RISER

B. INSTALLATION

LES is to build the Riser above the 10' of GRS and provide the cable to the meter when a meter is required. If there is no meter, then the contractor is to build the riser to its needed height and provide the cables, including enough cable for LES to energize.

C. METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Riser, complete, in place and accepted by the Engineer, will be measured for payment as single units and shall be paid for at the contract unit price bid per each for the item. This price shall be full compensation for all excavation required; for furnishing and installing the riser; for standoff installation, ground wire, ground rod, concrete encasement, steel riser guards, meter socket, and incidentals are considered part of the riser assembly.

24.21 CABINETS

B. INSTALLATION

The Cabinet pad shall be level in both directions.

Since Tracer Wire is so thin, the SWD-Write-On Tape shall be placed on wire perpendicular to the wire like a flag. Tracer Wire to furthest pull box shall be identified in the cabinet with travel direction (i.e. "NB" "CURBLANE" or "MEDIAN"). Tracer Wire to pole shall be identified in the cabinet with pole number, using just the last digit (i.e. "POLE 1").

24.24 TEMPORARY TRAFFIC SIGNAL

A. GENERAL

Temporary traffic signal systems shall be installed as called for on the plans. The City will furnish the Contractor with traffic signal and pedestrian signal heads, traffic signal cabinet, emergency receivers, video detector cameras, magnetic probes, and pedestrian push button assemblies, complete with the correct hardware for the application, such as, hanger assembly and tether for span wire installation. All other materials shall be furnished and installed by the Contractor, unless otherwise noted.

24.26 DYNAMIC MESSAGE SIGNS

A. GENERAL

Dynamic Message Signs shall be installed as shown on plans. The City will furnish the dynamic message sign, splice box and cable of sufficient length from the sign to the splice box to the cabinet. All other materials, such as, but not limited to, mounting hardware needed for the sign shall be furnished by the Contractor, unless otherwise noted.

B. INSTALLATION

The Contractor is responsible for mounting the sign and splice box; for installing the cable from the sign to the splice box and cable from the splice box to the cabinet. The Contractor shall splice the cables in the splice box.

C. METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Installation of the dynamic message sign shall be measured as a single unit and shall be paid for at the contract unit price each for the item. This price shall be full compensation for furnishing all materials not furnished by the City, installing all materials, for all labor associated with the installation of the sign, splice box, cable from the sign to the splice box and cable from the splice box to the cabinet, equipment, tools, materials, excavation, and incidentals required to complete the work.

24.23 ROADWAY LIGHTING, LUMINAIRES AND LAMPS

D. BASIS OF PAYMENT

Luminaires of the various types complete, in place and accepted by the Contract Administrator, shall be measured as single units and shall be paid for as LUMINAIRE, _____ at the contract unit price bid per each for the item. This price and payment shall be full compensation for furnishing and/or installing the Luminaires and for furnishing bulbs, labor, equipment, tools, materials, and incidentals necessary to complete the Work.

24.27 TRAFFIC MONITORING CAMERAS (HARDWARE)

A. GENERAL

Traffic Monitoring Camera Hardware shall be installed as shown on plans. The Contractor shall supply the Clamp Kit as specified in Section 24.19.A.

B. INSTALLATION

The clamp kit shall be attached at the top of the designated pole, pointing to the opposite corner of the intersection unless otherwise instructed, as shown on plans. The Camera Control Cable, Camera Power Cable and Coaxial Cable shall be run to the clamp kit location and coiled with a 20' coil.

The Traffic Monitoring Camera installation shall be completed by the City.

C. BASIS OF PAYMENT

Traffic Monitoring Camera Hardware, complete, in place and accepted by the Contract Administrator, shall be measured as single units and shall be paid for at the contract unit price bid per each for the item. This price and payment shall be full compensation for installing the Traffic Monitoring Camera Hardware, for furnishing all materials, installing all materials, and for all labor, equipment, tools, materials, and incidentals required to complete the Work.

24.28 RADIO ANTENNA HARDWARE

A. GENERAL

Radio Antenna Hardware shall be installed as shown on plans. The Contractor shall supply 2 Clamp Kits (as specified in Section 24.19) and 1 - 10' rigid 1 ½" Aluminum Conduit. All other materials shall be furnished and installed by the Contractor, unless otherwise noted.

B. INSTALLATION

The clamp kits shall attach the Aluminum Conduit to the designated pole, as shown on plans. The Aluminum Conduit shall be attached at the top of the pole. The clamp kits shall be spaced to best support the Aluminum Conduit and clear obstacles on the pole. The Camera Control Cable shall be run to the top of the Aluminum Conduit with a 20' coil at the top. The radio installation shall be completed by the City.

C. METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Radio Antenna Hardware shall be measured as a single unit and shall be paid for at the contract unit price per each for the item. This price shall be full compensation for furnishing all materials, installing all materials, and for all labor, equipment, tools, materials, and incidentals required to complete the work.

Environmental Contingency Plan
West Haymarket Redevelopment Site

Prepared for:

The Joint Public Agency of Lincoln, Nebraska

Benesch Project Number: 110058.00.00006

Revision 2 March 18, 2011

Prepared by:

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In consultation with

OLSSON ASSOCIATES and EnviroGroup Limited

SPILL/INCIDENT RESPONSE REFERRAL SHEET

Note: Waste/excess soil or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed below:

SPILL REPORTING

(Through City of Lincoln Environmental Project Management Team Decision Authority as described in Section 3.3 of the ECP)

First Call: Environmental Project Management Team Technical Representatives:

Frank Uhlarik – Alfred Benesch & Company:	**402-333-5792**
	Cell: 402-669-0546

Alternate:

Bill Imig – Olsson Associates:	**402-458-5903**
	Cell: 402-314-4568

Alternate:

Miki Esposito – Environmental Project Management Team: 402-441-6173

Agencies/Railroad Authorities:

Nebraska Department of Environmental Quality:	**402-471-2186 or 877-253-2603**
After Hours, Weekends and Holidays:	
Nebraska State Patrol Dispatch:	**402-471-4545**
BNSF Railway Company Resource Operations Center:	**800-832-5452**
Union Pacific Railroad Security:	**888-877-7267**
National Response Center:	**800-424-8802**

ALL OTHER INCIDENTS

Fire and Police: Dial 911

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FIGURES

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Figure 2 WHRS Area Boundaries

Figure 3a North Area Soil Impacts (in Packet)

Figure 3b South Area Soil Impacts (in Packet)

Figure 4a North Area Groundwater Impacts (in Packet)

Figure 4b South Area Groundwater Impacts (in Packet)

Figure 5 Wetland Map

TABLES

Table 1 Potential Wetland Disturbance Activities

Table 2 Common Wetland Avoidance Measures

Table 3 Wetland Impact Minimization Measures

ATTACHMENTS

Attachment 1 Chemical Information

Attachment 2 Project Forms

Attachment 3 Project – Specific Authorizations

LIST OF ACRONYMS

CERCLA	Comprehensive Environmental Response Compensation and Liability Act
COPC	Chemicals of Potential Concern
CR	Contractor's Representative
ECP	Environmental Contingency Plan
EPMT	City of Lincoln Environmental Project Management Team
PCBs	Polychlorinated Biphenyls
PM	Project Manager
SVOCs	Semi-volatile Organic Compounds
TR	Environmental Project Management Team Technical Representative
VOCs	Volatile Organic Compounds
WHRS	West Haymarket Redevelopment Site

1.0 PURPOSE

The purpose of this Project Environmental Contingency Plan (ECP) is to prescribe management procedures and preventive measures relevant to areas and activities associated with construction within the West Haymarket Redevelopment Site (WHRS) that present the potential for environmental impacts or regulatory concerns if not properly controlled. The ECP is further intended to provide the City of Lincoln's Environmental Project Management Team (EPMT) with a mechanism for centralized management and documentation control of environmental matters – most specifically related to management of impacted soils or other contaminated media throughout the duration of planned WHRS projects.

2.0 SCOPE

2.1 Background

The WHRS and surrounding area has been home to large scale industrial and commercial operations for over a century including railroad thru-freight and switching, locomotive and railcar servicing/repair, manufactured gas plant operations, tanneries, paint and pigment manufacturing and scrap processing. Environmental and geotechnical investigations performed within the WHRS in recent years have identified the presence of petroleum constituents, heavy metals, polychlorinated biphenyls (PCBs), and a variety of fuel and chemical components and breakdown products classified under the general categories of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) in soil and/or groundwater.

In some areas, the levels of constituent impacts in soil or groundwater have been documented to exceed health-based standards established by the Environmental Protection Agency (EPA) and/or Nebraska Department of Environmental Quality (NDEQ). These standards are established under differing assumptions of life-long exposure using residential and commercial/industrial scenarios and do not necessarily represent threats to human health under instantaneous or short term exposure as may be the case under a construction worker exposure scenario. The known presence of these constituents in certain defined areas and their potential occurrence in areas not yet thoroughly investigated, however, presents a scenario for human exposure and/or corollary environmental or regulatory impacts that must be avoided in order to 1) protect human health and the environment and 2) minimize disruptions and cost impacts to the overall WHRS project.

2.2 Applicability

The location of the project and general boundary of redevelopment activity are depicted in Figures 1 and 2, respectively. The boundary in Figure 2 represents tentatively planned redevelopment footprints which is <u>not</u> strictly defined or intended to restrict applicability of this ECP to related WHRS construction activities outside of the boundary. Figures 3 and 4 provide a representation of soil boring and groundwater monitoring well data showing values in soil or groundwater, respectively, that exceed health-based standards referenced in Section 2.1 of this ECP. ***With the exception of the free-product diesel fuel plume depicted northwest of the Lincoln Depot, there is no representation or assumption that impacts are continuous***

between affected borings, nor is there a representation or assumption that impacts do <u>not</u> occur between borings represented as below health-based standards.

A tentative list of the suspected chemicals of potential concern (COPC) known to have been detected in site soils and/or groundwater along with representative chemical profiles is included as Attachment 1. The preponderance of COPC occurrence consists of petroleum, petroleum constituents, traces of heavy metals (some – largely arsenic believed to be naturally occurring) VOCs, SVOCs and limited occurrences of PCBs. Compounds detected are common to railroad operations, former manufactured gas plant operations and/or scrap operations which encompass the major focus of investigations in the WHRS.

The scope of preventive measures and management procedures prescribed in this ECP are designed to cover all intrusive work in the WHRS. Intrusive work activities include (but are not limited to):

- Excavation
- Grading
- Drilling
- Boring
- Utility Trenching
- De-watering

This ECP does not address standard safety – related activities and programs such as confined space entry, electrical safety, fall protection, etc. regulated by the Federal Occupational Health and Safety Administration (OSHA under 29 CFR 1910). Project safety policies, procedures and compliance are the responsibility of the respective organizations and personnel who have cause to be in the project area in some official capacity or employment including railroads, City of Lincoln employees, regulatory agencies, contractors, consultants, and other suppliers of services to the project. The need for safety – specific precautions (including the potential for vapors in excavations and utility corridors) should, however be discussed during pre-construction briefings.

Section 4.0 of this ECP describes management procedures and required preventive measures to be followed by all personnel involved in WHRS construction activities.

Note: Waste/excess soil, sludge or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed in the table in Section 3.1 and on the Spill/Incident Referral Sheet at the beginning of this document.

3.0 ECP MANAGEMENT

3.1 Roles and Responsibilities

This ECP has been prepared for and will be managed by the City of Lincoln's Environmental Project Management Team (EPMT) led by the Public Works Liaison & Compliance Administrator. The EPMT has contracted with Alfred Benesch & Company (Benesch) to provide environmental consulting services including preparation and implementation of the ECP.

Specifically, as an agent or technical representative (TR) of the EPMT, Benesch will:

- Prepare and amend the ECP as needed
- Disseminate the ECP to key stakeholders in the WHRS Project(s)
- Provide project/task start-up briefings when applicable (see Section 2.2)
- Provide compliance verification relative to handling of impacted soils/other media
- Provide on-call incident assistance to Project Managers (PM) and Contractor's Representatives (CR) including sampling and analysis of suspect materials

The EPMT in turn provides routine coordination and support to the WHRS Program Manager in terms of environmental issues related to the overall WHRS project. Roles and responsibilities of the EPMT and WHRS Program Manager as well as other key stakeholders in the WHRS project with an interest and responsibility in conforming to this ECP are described in the table below:

Organization	Role	Responsibility	Contact
WHRS Program Manager	Overall WHRS program execution	Support conformance to the ECP	Jim Martin 417-251-1695 Jim.martin@benham.com
City of Lincoln EPMT	Overall WHRS environmental performance	Prepare and oversee execution of the ECP	Miki Esposito 402-441-6173 mesposito@lincoln.ne.gov
Benesch/Olsson Associates	Technical Representative to EPMT	Prepare and oversee execution of the ECP	Frank Uhlarik 402-669-0546 fuhlarik@benesch.com Bill Imig (402) 314-4568 bimig@oaconsulting.com
BNSF	Landowner, Project Manager	Support conformance to the ECP by BNSF work forces and contractors	Greg Jeffries 763-782-3490 Gregory.jeffries@bnsf.com Gerald Maczuga 402-458-7537 Gerald.maczuga@bnsf.com
Contractors	Performance of any construction work in WHRS	- Attend pre-construction briefings on ECP - Comply with ECP	As identified by City, BNSF or other Property Owners within the WHRS
NDEQ	Regulatory Authority	Provide advice to EPMT regarding compliance requirements	Mike Felix 402-471-2938 Mike.felix@nebraska.gov

3.2 Documentation and Control

The following forms (included in Attachment 2) are to be used in maintaining and documenting compliance with the ECP:

ECP-1: Contractor Certification of Receipt and Special Precautions

This form will be reviewed and signed by the PM or CR certifying that he/she has received a copy of the ECP and agrees to comply with applicable work practices. In addition, task-specific precautions pertaining to COPCs, likely areas/volumes of impacted soil to remove, potential re-use of material as fill, etc. are to be documented on this form reflecting agreed upon

procedures for the project and task between the contractor and TR. The Form ECP-1 will be co-signed by the TR.

ECP-2: Incident Log

This form will be filled out by the TR to record "incidents" and any follow-up corrective actions. "Incidents" will generally refer to observed or reported deviations from standard construction procedures, plans and specifications including, the following:

- Spills or discharges of hazardous substances, petroleum or equipment wash water/wastewater released to the environment associated with construction activities.
- Any observed or reported encounter with visibly or otherwise apparent impacted soil, groundwater, surface water or sediment contamination resulting from intrusive activities (grading, excavating, drilling, boring, utility work).
- Encroachment/impact upon defined wetland areas as further discussed in Section 4.2.

It is the responsibility of all stakeholders listed above in their capacity as project managers and contractors to comply with the provisions of the ECP and ensure notifications are made to the hierarchy of contacts listed on the Spill/Incident Response Referral Sheet found at the beginning of this ECP. Each contractor/stakeholder shall designate one responsible point of contact and one alternate for reporting incidents to ensure uniform and consistent control and reporting of information and to avoid duplicative or superfluous reporting.

Incident reporting in itself is not a cause for work stoppage – merely a notification to the EPMT of a condition that may require further investigation, evaluation through sampling/testing or other approved methods of determination and documented resolution by the TR. ***It is not the role of the TR to direct or in any way affect work stoppage. Work stoppage will be dictated solely by the project manager or contractor's representative based on his or her corporate health and safety policies and procedures.***

Copies of all completed Forms ECP-1 and ECP-2 will be maintained by the TR at the Benesch offices located at 825 "J" Street in Lincoln, NE.

3.3 Regulatory Reporting

The need for reporting releases to State, Federal or Local authorities will be determined by the EPMT in consultation with the BNSF or other landowners potentially impacted by the release. Required reporting contacts are listed on the Spill/Incident Response Referral Sheet found at the beginning of this ECP. The following reporting guidelines have been extracted from NDEQ Title 126 - Rules and Regulations Pertaining to Management of Waste, Chapter 18 – Releases of Oil or Hazardous Substances which will be used by the EPMT in determining the need to report incidents:

002 Release Notification Requirements:

002.01 It shall be the duty of any responsible person to notify the Department of any release or suspected release of an oil or hazardous substance, in the following manner:

002.01A Immediate notification is required regardless of the quantity of an oil or hazardous substance release which occurs beneath the surface of the land or impacts or threatens waters of the state or threatens the public health and welfare.

002.01B **Immediate notification is required** of a release upon the surface of the land of an **oil in a quantity that exceeds 25 gallons**, or of a **hazardous substance** which equals or exceeds **100 pounds or its reportable quantity** under Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended (40 CFR Part 302) and Section 329(3) of the Emergency Planning and Community Right-to-Know Act of 1986 (40 CFR Part 355), whichever is less.

002.01B1 Notification is **not required** for a release under this subsection if either of the following conditions is met:

002.01B1a The release is confined and expected to stay confined within a building or otherwise wholly enclosed structure, owned by the responsible party, in which the floors and walls are of non-earthen materials which are adequately impervious to the released substance(s) and is cleaned up within 24 hours of its discovery, or
002.01B1b The release is in compliance with conditions established in State statutes, regulations or permits.

002.01C Notification is **not required** for any release upon the surface of the land of oil or hazardous substance that does not exceed the reportable quantities in 002.01B above and which will not constitute a threat to public health and welfare, the environment, or a threat of entering the waters of the state and provided that the release is cleaned up.

002.02 Notification shall be made by telephone to the Department during office hours, from 8:00 a.m. to 5:00 p.m. Monday through Friday. After hours and holidays, reports shall be made to the Nebraska State Patrol (***numbers listed in the Spill/Incident Referral Sheet at the beginning of this Plan***). All information known about the release at the time of discovery is to be included, such as time of occurrence, quantity and type of material, location and any corrective or cleanup actions presently being taken.

Note: Waste/excess soil, sludge or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed in the table in Section 3.1 and on the Spill/Incident Referral Sheet at the beginning of this document.

4.0 WORK PROCEDURES

4.1 Access

Access to the WHRS is restricted to railroad and City of Lincoln personnel and contractors conducting work in their official capacity as employees or contractors of their respective

organizations. Access to Railroad operating property for purposes of providing construction – related services is subject to specific safety and rules training certifications and requirements found at: www.contractororientation.com. Access to other non-railroad private property for purposes of performing construction – related services within the WHRS must be arranged through the EPMT.

4.2 Best Management Practices

In general, PMs and CRs are accountable for obtaining applicable permits and authorizations for project activities under their purview including:

- Storm Water NPDES Construction Permits
- Flood Plain Permits
- Wetland (Section 404) Permits
- Special Waste Disposal Approval (Lincoln Lancaster County Health Department (LLCHD) or other entity that will receive the waste) for impacted soils/debris
- Dewatering Permit for Deep Excavations and Utilities (NPDES)
- State Historic Preservation Office (SHPO) Coordination

Some permits/authorizations (such as the Wetland Section 404 Permit) have been or will be obtained from the regulatory agency by the City of Lincoln for the WHRS. Special waste disposal will also be coordinated by and with the EPMT, however, PMs and CRs must be aware of and comply with provisions associated with these permits/authorizations.

Due to the potential risks and penalties involved in management of impacted media and protection of rare and unique saline wetlands as well as the wide applicability of these issues to planned construction activity, prescriptive management practices for these areas are as follows:

4.2.1 Impacted Soil and Debris Management

1. A fundamental premise regarding the regulatory status of any soils, debris or other media encountered during intrusive activities is that such items are not considered waste material until determined by the ***PM or CR in consultation with the TR*** to be no longer suitable for its intended purpose.

2. Title 132, Chapter 1, Section 041 defines fill as: *"solid waste that consists only of one or more of the following: sand, gravel, stone, soil, rock, brick, concrete rubble, asphalt rubble, or similar material".*

3. The *"use of fill for legitimate land improvement (backfilling a foundation) is allowed per Title 132, Chapter 2, Section 002.01 as long as the fill is not mixed with other solid wastes that have the potential to cause contamination that may threaten human health or the environment".*

4. In accordance with Federal and State regulations and guidance, routine trench or foundation excavation spoils that are generated at a site are not considered a waste unless it is intended for disposal. Such spoils can normally be replaced in the excavation.

It should be noted, however that any suspect material encountered during trench and foundation excavation must be inspected by the TR and only replaced if deemed by the TR not to be a vapor hazard within the utility corridor or building being constructed.

5. Prior to initiation of each construction task, the project manager or contractor's representative will consult with the TR to determine the type of material anticipated to be excavated, potential contaminants of concern (if any) and allowable re-use (including use as fill), alternatives to be employed for excess soil or debris to be generated associated with his/her respective work task. Provisions for temporary storage of potentially impacted soil/debris must be explicitly agreed upon. A written summary of these determinations is to be included in the Form ECP-1 completed for the work effort and filed according to procedures listed in Section 3.2 above.

6. On March 8, 2011, the NDEQ issued a guideline for management of excess soils for various activities within the WHRS covered under this ECP. Any discrepancies between NDEQ guidance and what is prescribed in the ECP must be resolved with the TR. The guidance is in Attachment 3.

7. A special waste authorization has been obtained from the Lincoln/Lancaster County Health Department for disposal of specified petroleum – impacted soils at the City of Lincoln's Bluff Road Landfill. This authorization is included in Attachment 3 and may only be used when approved by the TR.

Note: Waste/excess soil, sludge or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed in the table in Section 3.1 and on the Spill/Incident Referral Sheet at the beginning of this document.

4.2.1.1 *Investigative Drilling/Boring*

Drilling investigations conducted under the supervision and oversight of the NDEQ under the Voluntary Cleanup Program or Title 200 Programs require preparation of specific investigation work plans to address drill cuttings and other "Investigation – Derived Wastes" (IDW). This effort is managed by the TR and will follow established work plan protocols.

Geotechnical investigations (GI) within the WHRS will require conformance to the following management practices:

1. The GI Project Manager must contact the TR at least 7 days prior to drilling to discuss anticipated conditions and any special precautions to consider.

2. The GI Project Manager must arrange for all utility clearance.

3. The GI Project Manager will complete Form ECP-1 in consultation with the TR.

4. A TR must be on-site or on call to respond to questions or observations that could require sampling or determinations relevant to management of soil cuttings.

5. Unless superseded by other special considerations (such as drilling in known or highly suspected areas of impacted soils/groundwater), drilling procedures and soil cuttings management may proceed under standard GI processes and procedures including boring abandonment.

6. If during the completion of the boring the drill crew encounters potentially impacted soils, cuttings will be placed on plastic sheeting and segregated from non-impacted cuttings. Work shutdown will be at the discretion of the GI Project Manager's corporate health and safety policies and practices.

7. At the conclusion of the boring, impacted soil cuttings should be placed back in the boring at the relative depth/order which retrieved. The surface should be sealed with a minimum of three ft. of bentonite/cement slurry and if within 100ft. of a planned building should ideally extend from the surface to the depth of identified impacts.

8. Any remaining impacted soil cuttings will be sampled and analyzed as determined by the TR and instructions provided to the GI Project Manager for proper handling of the material. Cuttings must remain on plastic sheeting and covered with plastic or placed in sealed drums and labeled with the boring number until directions for further handling are provided by the TR.

9. Upon final resolution, the TR will complete and file an ECP-2 form relative to any IDW disposed of off-site or additional activities resulting in on-site re-use or application (land-spreading) of drill cuttings.

4.2.1.2 *Grading/Excavation*

Grading and excavating activities conducted under the supervision and oversight of the NDEQ under the Voluntary Cleanup Program or Title 200 Programs require preparation of specific remedial action work plans to address management of impacted soils and debris. This effort is managed by the TR and will follow established work plan protocols.

All other construction grading and excavation activities associated with applicable WHRS project activities require coordination and ECP compliance as follows:

1. Grading/excavation project manager/contractor's representative (PM/CR) must contact the TR at least 14 days prior to initiation of grading/excavation work to discuss anticipated conditions and any special precautions to consider.

2. The PM/CR must arrange for all utility clearance.

3. The PM/CR must meet with the TR to discuss task – specific precautions (as detailed in any and all applicable work activities described in this Section 4.2), complete and sign Form ECP-1 and provide to the TR for co-signature and filing.

4. A TR must be on-site or on call to respond to questions or observations that could require sampling or determinations relevant to management of impacted soil or debris. ***It is the responsibility of the PM/CR to notify the TR of construction schedules and activities (including any changes in schedules or scope of work effort) that may require on-site support and observation.***

5. Unless superseded by other special considerations (documented in ECP-1), grading/excavation activities may proceed per the contractual project/task plans and specifications.

6. Changing field considerations and observations (including encountering suspect soils/debris/other media or modifications of proposed areas/volumes of soil grading/excavation/filling) must be reported to the TR.

7. If during execution of contractual plans and specifications the PM/CR determines the need to manage excess soils/debris/other media) not previously addressed in Form ECP-1, the PM/CR will consult with the TR to discuss management of affected media. Resolution and ultimate fate of the affected media will be documented by the TR on Form ECP-2 and filed according to procedures in Section 3.2.

8. Work shutdown will be at the discretion of the PM/CR's corporate health and safety policies and practices.

Note: Waste/excess soil, sludge or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed in the table in Section 3.1 and on the Spill/Incident Referral Sheet at the beginning of this document.

4.2.1.3 *Utility Work*

Contractors performing utility work including all intrusive work (trenching, boring, digging, etc.) where surface features (soil, concrete, asphalt, vegetated surfaces) will be disturbed require conformance to the following procedures:

1. The utility project manager/contractor's representative (PM/CR) must contact the TR at least 14 days prior to initiation of intrusive utility work to discuss anticipated conditions and any special precautions to consider.

2. The PM/CR must arrange for all related utility clearance.

3. The PM/CR must meet with the TR to discuss task – specific precautions (as detailed in any and all applicable work activities described in this Section 4.2), complete and sign Form ECP-1 and provide to the TR for co-signature and filing.

4. A TR must be on-site or on call to respond to questions or observations that could require sampling or determinations relevant to management of impacted soil or debris. ***It is the responsibility of the PM/CR to notify the TR of construction schedules and activities (including any changes in schedules or scope of work effort) that may require on-site support and observation.***

5. Unless superseded by other special considerations (documented in ECP-1), utility construction activities may proceed per the contractual project/task plans and specifications.

6. Changing field considerations and observations (including encountering suspect soils/debris/odors or other media or modifications of proposed routes of utility corridors) must be immediately reported to the TR.

7. In general, soil/debris/spoils which will not be removed from the site can be used as backfill around utilities if determined by the PM/CR to be suitable fill material and the material has no appearance of contamination or odor. ***Soil/debris/spoils removed during the course of intrusive utility work with an appearance of contamination or odor will be immediately notified to the TR for consultation and resolution including temporary storage of the suspect material.***

8. If during execution of contractual plans and specifications the PM/CR determines there is a need to manage excess soils/debris/other media) not previously addressed in Form ECP-1, the PM/CR will consult with the TR to discuss management of affected media. Resolution and ultimate fate of the affected media will be documented by the TR on Form ECP-2 and filed according to procedures in Section 3.2.

9. Work shutdown will be at the discretion of the PM/CR's corporate health and safety policies and practices.

Note: Waste/excess soil, sludge or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed in the table in Section 3.1 and on the Spill/Incident Referral Sheet at the beginning of this document.

4.2.2 De-Watering Operations

De-watering operations within the WHRS will generally be associated with excavation or utility work described above. A project – specific Dewatering Permit has been provided by the NDEQ that governs any de-watering operations bounded by 2nd Street on the west, Salt Creek on the north and west, 8th Street on the east and "J" Street on the south. The permit and related conditions is included in Attachment 3. The City of Lincoln has been issued the permit and all

contractors intending to utilize the permit will co-sign as owner/operator and will be held to all terms and conditions of the permit.

Required sampling and reporting to NDEQ will be conducted by the TR and approval to discharge accumulated storage of dewatering fluids must be obtained from the TR prior to discharge. Initial dewatering discharge flows must be containerized for sampling and testing by the TR, whereupon results will be provided to the contractor along with permission to discharge under the above referenced permit. Alternative means of discharge (whether to the City of Lincoln's Sanitary Sewer System or off-site disposal), may be required if permit parameters are exceeded. Such alternative means will be in accordance with contractual requirements and shall be explicitly agreed upon by the CR and TR and documented on Form ECP-2.

Note: Waste/excess soil, sludge or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed in the table in Section 3.1 and on the Spill/Incident Referral Sheet at the beginning of this document.

4.2.3 Wetland Protection

4.2.3.1 Summary of Delineated Wetland Areas

Olsson and Associates (OA) and HWS Consulting Group (HWS) staff conducted a wetland delineation and assessment for the Haymarket Project area in 2007. According to the 2007 Wetland Delineation Report (Olsson/HWS September 2008), the Study Area encompassed 443 acres of land for the Project. Based on the methodology as described in the September 2008 Wetland Delineation Report, 22 separate and distinct wetland areas are located within the Study Area totaling 8.65 acres. In addition, two perennial streams are located within the Study Area and are considered jurisdictional waterways. A map of the defined areas is provided as Figure 5.

4.2.3.2 Avoidance and Minimization

State and federal regulations require that an applicant utilize a three-part process (mitigation sequencing) when evaluating potential impacts to wetlands and waterways. The mitigation sequence generally is as follows:

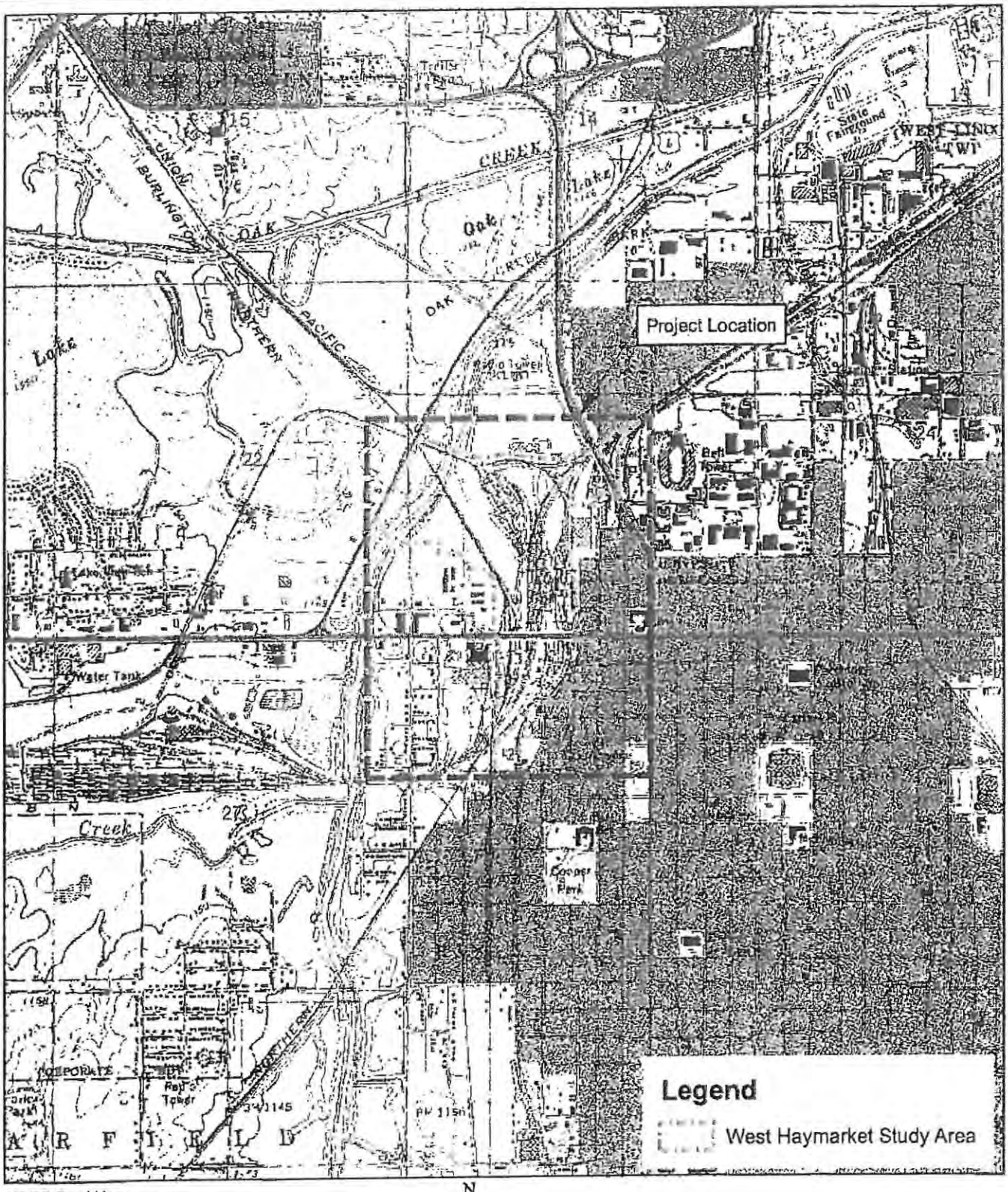
- *Avoid* adverse impacts to wetlands
- *Minimize* adverse impacts that cannot be avoided
- *Mitigate* for the remaining impacts that cannot be avoided or further minimized. Note: compensatory mitigation relates to permanent impacts and permanent loss of function, and can be used to offset significant short-term impacts that may be in effect for an extended period of time.

State and Federal Law generally requires that the applicant demonstrate that impacts[1] to jurisdictional wetlands and waters have been avoided and minimized to the greatest extent practicable. Potential construction practices near the boundaries of the delineated wetland areas should be considered when evaluating grading alternatives. For the purpose of the WHRS projects, wetland resources will be avoided to the extent practicable according to Section 404(b)(1) guidelines.

Tables 1 through 3 describe the typical disturbance activities, avoidance and minimization measures, respectfully for the wetland areas known to exist in the WHRS project area. These activities must be reviewed and determined by the PM/CR to what extent they must be employed and specified in EP-1 described above. Additional provisions relative to the 404 permit to be aware of and complied with will be attached to this ECP when the permit is obtained.

[1] 'Impacts' include fill, removal, mechanized land clearing (e.g., grubbing, bulldozing vegetation)

FIGURES



NRCS Quad Map

benesch
engineers · scientists · planners

N
W E
S

0 500 1,000 2,000
Feet

1 inch = 2,000 feet

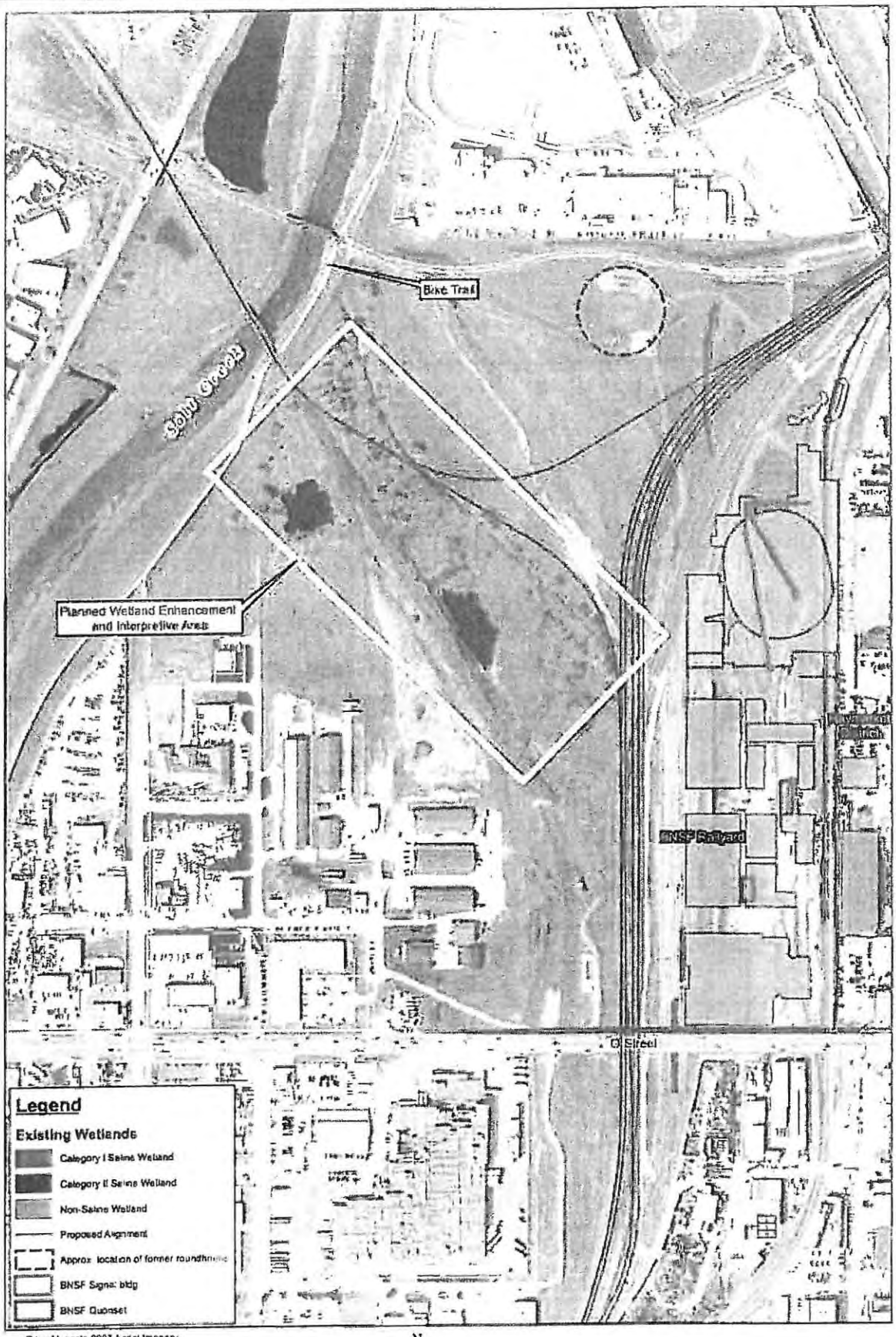
Figure 1
Site Location Map

Environmental Contingency Plan
Lincoln, Nebraska

N 2ND ST
N 3RD ST
O ST
S 2ND ST
M ST
S 6TH ST
L ST
S 7TH ST
S 8TH ST
N ST
M ST
S 9TH ST
N 9TH ST
O ST
H ST
N 8TH ST
O ST
R ST
S ST
S ST

Figure 3a North Area Soil Impacts
Figure 3b South Area Soil Impacts
Figure 4a North Area Groundwater Impacts
Figure 4b South Area Groundwater Impacts

***Note that these figures are continually updated to reflect ongoing field investigations. A copy of the most current figures can be obtained from the Benesch Project Manager.**



City of Lincoln 2007 Aerial Imagery

N
W E
S

200 100 0 200 Feet

1 inch = 300 feet

benesch
engineers scientists planners

Figure 5
Wetlands Delineations

Environmental Contingency Plan
Lincoln, Nebraska

TABLES

Table 1 Potential Disturbance Activities		
Type of Activity	Description	Typical Examples and Effects
Fill	Fill is defined as any organic or inorganic material that is placed in a wetland or waterway[2].	• Temporary construction access roads • Stockpiling of construction material and or debris • Demolition • Construction pads for boring or other work • Trench side cast material • Work bridge or temporary detour structure piling • Highway improvements—shoulder widening, additional lanes, guardrail flares, etc.
Removal	Removal is defined as any organic or inorganic material that is removed from a wetland or waterway.	• Exploratory sampling or boring • Surface grading to create construction 'pad' or flat work area • Temporary trenching • Ditch cleaning where not exempt
Clearing / Grubbing	Clearing and grubbing involves the removal of vegetation and the top layer of soil to remove part of the roots.	• Sub-grade preparation • Abutment construction • Road bank re-contouring
Vegetation Clearing	To claim vegetation disturbance without soil disturbance the activity must involve cutting trees and shrubs off at their base, plucking them up, placing the debris in a truck and hauling it off.	• Creation of a roadway clear-zone
Hydrologic Changes	Changes that the project causes that affect the hydrology of the wetland or waterway	• Impeding or restricting the passage of normal or expected high flows • Stormwater treatment or drainage design that effectively alters wetland hydrology • Causing flooding or erosion downstream of the project • Draining an adjacent wetland by trenching/ditching/excavating

[2] According to the U.S. Army Corps of Engineers, piling is considered a structure and the placement of piling in a wetland or waterway does not require a permit under Section 404 of the Clean Water Act, which regulates the discharge of fill material. The placement of piling may be regulated under Section 10 of the Rivers and Harbors Act, which applies to tidally influenced and navigable waterways.

Table 2 Common Avoidance Measures	
Construction and Design Elements	**Considerations**
Reducing the Build Footprint	The use walls instead of fill slopes near wetlands and waterways should be considered if feasible and sustainable (i.e., will protect wetland functions with little maintenance). Walls are usually more costly than fill but the cost of mitigation should be weighed against the cost of fill.
Road Placement	Designing the placement of roadways to avoid wetlands and waterways is often not feasible; however slight shifts in alignment can often avoid and or minimize impacts to wetlands and waterways.
Temporary Roads and Access	Consider construction staging to avoid impacts where necessary and safety allows. Place staging areas, temporary access roads, or storage areas outside of wetlands and waterways. The wetlands and waterways will be demarcated on the plans sheets as well as in the field as no work zones to avoid incidental impacts. If temporary access to piers or girders on a bridge is needed, evaluate the feasibility of conducting the work using scaffolding hanging from the topside of the bridge or limiting equipment access to the bank above ordinary high watermark.
Stormwater Facilities	Avoid constructing storm water facilities in wetlands. Other locations or designs for stormwater facilities should be reviewed to determine that no other practicable alternative to locating them within a wetland exists.
Temporary Stockpiling of Materials	Avoid temporarily stockpiling construction material in wetlands. Suitable staging and stockpile areas are usually available. If absolutely necessary, follow minimization techniques for temporary fill described in Table 3.

Table 3 Minimization Measures	
Design and Construction Elements	**Minimization Measure(s)**
Temporary Fill for access roads, staging, other.	Can compact soil and also be difficult to remove after use (e.g., individual pieces of gravel sink into the soil substrate. Fill material removal can be made easier by using geotextile fabric in combination with either chain link fencing (placed below the geotextile fabric), or a geogrid (placed on top of geotextile fabric). Fill material is then placed on the top of these materials. When construction is complete fill is removed in lifts until a small amount remains to allow the sub material to be pulled up without ripping or breaking. The use of large 'balloon' tires on trucks and other equipment can help prevent soil compaction.
Construction Near Wetlands	If not properly demarcated construction impacts can "spread" into wetlands intended for avoidance. To minimize impacts clearly identify wetlands on plan sheets and demarcate on the ground using orange construction fencing and or silt fencing.
Construction Pads	Consider the use of crane mats, which are easily removed upon project completion with little mess (see photo).
Side cast material	Side cast material placed in wetlands should be replaced in the trench in the same order removed (i.e. topsoil segregation) to ensure the integrity of the soil is maintained and wetland impacts where the trench is located are minimized.
Sampling or Boring	Limit access to the wetland by sampling the edges instead of driving through the middle. If access is necessary it should be timed when the area is dry.
Temporary Trenching	Temporary impacts can become permanent if the trench is not adequately backfilled to prevent draining the adjacent wetland. Consider using clay plugs in the trench if the trench has the potential to "dewater" a wetland. Monitor area for changes.
Clearing / Grubbing and Vegetation Clearing	Limits of construction should be clearly shown on plans and identified on the ground. Wetlands should not be grubbed unless necessary or where they will be permanently impacted. If appropriate re-vegetate cleared and grubbed areas.
Hydrologic Changes	Implement erosion control measures and manage construction storm water to avoid sedimentation in wetlands. Place permeable fill material or install small culverts to maintain connectivity between wetlands. New stormwater facilities should use infiltration or avoid redirection from or to an existing wetland or waterway.

ATTACHMENT 1

PRELIMINARY CHEMICALS OF POTENTIAL CONCERN

ALTER
PCOPCs

2-Butanone (MEK)
Arochlor 1248
Arochlor 1260
Arsenic
Barium
Benzene
Cadmium
Chromium
Ethylbenzene
Lead
Mercury
Naphthalene
Silver
Toluene
Xylenes, total

BNSF
PCOPCs

1-Methylnaphthalene
2-Methylnaphthalene
4-Methyl-2-pentanone
Acenaphthene
Acenaphthylene
Acetone
Anthracene
Arsenic
Barium
Benzene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
bis(2-Ethylhexyl)phthalate
Cadmium
Carbazole
Carbon Disulfide
Chloroform
Chromium
Chrysene
cis-1,2-Dichloroethylene
Dibenzo(a,h)anthracene
Dibenzofuran
Diethyl Phthalate
Fluoranthene
Fluorene
Indeno(1,2,3-cd)pyrene
Isopropylbenzene
Lead
Mercury
Naphthalene
n-Butylbenzene
n-Propylbenzene
Phenanthrene
p-Isopropyltoluene
Pyrene
sec-Butylbenzene
Selenium
Silver
tert-Butylbenzene
TEH (Diesel)
TEH (Motor Oil)
Trichloroethylene
Vinyl Acetate

JAYLYNN
PCOPCs

1,1,2-Trichloroethane
2-Methylnaphthalene
4-Chloroaniline
Acenaphthene
Acenaphthylene
Acetone
Anthracene
Arsenic
Azobenzene
Barium
Benzene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Cadmium
Carbazole
Carbon disulfide
Chromium
Chrysene
Dibenzo(a,h)anthracene
Dibenzofuran
Di-n-butyl phthalate
Ethylbenzene
Fluoranthene
Fluorene
Hexane
Indeno(1,2,3-cd)pyrene
Lead
Mercury
Methyl ethyl ketone
Methyl Tert Butyl Ether
Methylene chloride
Naphthalene
Phenanthrene
Pyrene
Selenium
Styrene
Toluene
TEH (Diesel)
TEH (Motor Oil)
Xylenes, total

LINCOLN DEPOT
PCOPCs

1,3,5-Trimethylbenzene
1-Methylnaphthalene
2-Methylnaphthalene
Acenaphthene
Acetone
Arsenic
Barium
Benzene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Cadmium
Carbon disulfide
Chromium
Chrysene
Dibenzofuran
Ethylbenzene
Fluoranthene
Fluorene
Hexane
Indeno(1,2,3-cd)pyrene
Isopropylbenzene
Lead
Mercury
Methyl ethyl ketone
Naphthalene
n-Butylbenzene
n-Propylbenzene
o-Xylene
Phenanthrene
p-Isopropyltoluene
Pyrene
sec-Butylbenzene
Toluene
TEH (Diesel)
TEH (Motor Oil)

1,1,2-TRICHLOROETHANE

What is 1,1,2-trichloroethane?

1,1,2-Trichloroethane is a colorless, sweet-smelling liquid. It does not burn easily, can be dissolved in water, and evaporates easily. It is used as a solvent (a chemical that dissolves other substances) and as an intermediate in the production of the chemical, 1,1-dichloroethane. 1,1,2-Trichloroethane is sometimes present as an impurity in other chemicals, and it may be formed when another chemical breaks down in the environment under conditions where there is no air.

What happens to 1,1,2-trichloroethane when it enters the environment?

- Most 1,1,2-trichloroethane released into the environment will go into the air.
- 1,1,2-Trichloroethane breaks down slowly in air; it takes approximately 49 days for half of it to break down.
- 1,1,2-Trichloroethane may enter the groundwater by filtering through the soil.
- It appears to stay in water for a long time; it takes years for it to break down.

1,2-DICHLOROETHANE

What is 1,2-dichloroethane?

1,2-Dichloroethane, also called ethylene dichloride, is a manufactured chemical that is not found naturally in the environment. It is a clear liquid and has a pleasant smell and sweet taste. The most common use of 1,2-dichloroethane is in the production of vinyl chloride which is used to make a variety of plastic and vinyl products including polyvinyl chloride (PVC) pipes, furniture and automobile upholstery, wall coverings, house wares, and automobile parts. It is also used as a solvent and is added to leaded gasoline to remove lead.

What happens to 1,2-dichloroethane when it enters the environment?

- 'Most of the 1,2-dichloroethane released to the environment is released to the air. In the air, 1,2-dichloroethane breaks down by reacting with other compounds formed by sunlight. It can stay in the air for more than 5 months before it is broken down.
- 1,2-Dichloroethane can also be released into rivers and lakes. It breaks down very slowly in water and most of it will evaporate to the air.

1,2-DICHLOROETHENE

What is 1,2-dichloroethene?

1,2-Dichloroethene, also called 1,2-dichloroethylene, is a highly flammable, colorless liquid with a sharp, harsh odor. It is used to produce solvents and in chemical mixtures. You can smell very small amounts of 1,2-dichloroethene in air (about 17 parts of 1,2-dichloroethene per million parts of air [17 ppm]). There are two forms of 1,2-dichloroethene; one is called *cis*-1,2-dichloroethene and the other is called *trans*-1,2-dichloroethene. Sometimes both forms are present as a mixture.

What happens to 1,2-dichloroethene when it enters the environment?

- 1,2-Dichloroethene evaporates rapidly into air.
- In the air, it takes about 5-12 days for half of it to break down.
- Most 1,2-dichloroethene in the soil surface or bodies of water will evaporate into air.
- 1,2-Dichloroethene can travel through soil or dissolve in water in the soil. It is possible that it can contaminate groundwater.
- In groundwater, it takes about 13-48 weeks to break down.
- There is a slight chance that 1,2-dichloroethene will break down into vinyl chloride, a different chemical which is believed to be more toxic than 1,2-dichloroethene.

1,2-DICHLOROPROPANE

What is 1,2-dichloropropane?

1,2-Dichloropropane is a colorless, flammable liquid with a chloroform-like odor. It is moderately soluble in water and readily evaporates into air. It does not occur naturally in the environment. 1,2-Dichloropropane production in the United States has declined over the past 20 years. It was used in the past as a soil fumigant, chemical intermediate, and industrial solvent and was found in paint strippers, varnishes, and furniture finish removers. Most of these uses were discontinued. Today, almost all of the 1,2-dichloropropane is used as a chemical intermediate to make perchloroethylene and several other related chlorinated chemicals.

What happens to 1,2-dichloropropane when it enters the environment?

- 1,2-Dichloropropane released to air can spread to areas far from where it was released because it is not rapidly broken down by reactions with other chemicals and sunlight.
- Most of the 1,2-dichloropropane in water will evaporate to the air.
- When released to soil, it is not easily broken down by bacteria, but will easily evaporate to the air and filter into the groundwater.

- 1,2-Dichloropropane does not build up in the food chain.

SILVER

What is silver?

Silver is a naturally occurring element. It is found in the environment combined with other elements such as sulfide, chloride, and nitrate. Pure silver is "silver" colored, but silver nitrate and silver chloride are powdery white and silver sulfide and silver oxide are dark-gray to black. Silver is often found as a by-product during the retrieval of copper, lead, zinc, and gold ores. Silver is used to make jewelry, silverware, electronic equipment, and dental fillings. It is also used to make photographs, in brazing alloys and solders, to disinfect drinking water and water in swimming pools, and as an antibacterial agent. Silver has also been used in lozenges and chewing gum to help people stop smoking.

What happens to silver when is enters the environment?

- Silver may be released into the air and water through natural processes such as the weathering of rocks.
- Human activities such as the processing of ores, cement manufacture, and the burning of fossil fuel may release silver into the air.
- It may be released into water from photographic processing.
- Rain may wash silver out of soil into the groundwater.
- Silver does not appear to concentrate to a significant extent in aquatic animals.

ARSENIC

Arsenic is a metalloid

- Arsenic is ordinarily a steel gray metal-like material that occurs naturally.
- Arsenic compounds can be categorized as inorganic or organic.
- Inorganic arsenic is primarily used as a preservative for wood to make it resistant to rotting and decay. In 2003, the use of arsenic-containing wood preservatives was phased out for certain residential uses such as play structures, picnic tables, decks, fencing, and boardwalks. Arsenic wood preservatives are still used in industrial applications.
- Inorganic arsenic occurs naturally in soil and in many kinds of rock, especially in minerals and ores that contain copper or lead.

- Elemental arsenic is used as an alloying element in ammunition and solders, as an anti-friction additive to metals used for bearings, and to strengthen lead-acid storage battery grids.
- In the past, inorganic arsenic compounds were used as pesticides; this use is no longer permitted.
- MMA is used for weed control on cotton turf grass and lawns and under trees, vines, and shrubs. DMA, also referred to as cacodylic acid, is used for weed control under nonbearing citrus trees, around buildings and sidewalks, and for lawn renovation.

Arsenic in the Environment

- Arsenic cannot be destroyed in the environment. It can only change its form or become attached to or separated from particles.
- Arsenic attached to very small particles may stay in the air for many days and travel long distances.
- Arsenic in soil may be transported by wind or in runoff or may leach into the subsurface soil. Arsenic is largely immobile in agricultural soils, therefore, it tends to concentrate and remain in upper soil layers indefinitely.
- Transport and partitioning of arsenic in water depends upon the chemical form. Soluble forms move with the water and may be carried long distances. Arsenic may be adsorbed from water onto sediments or soils.

BARIUM

Barium is an alkaline earth metal

- Barium is a silvery-white metal that primarily occurs in nature as barite (barium sulfate) and witherite (barium carbonate) ores.
- Barium compounds are solids, existing as powder or crystals.

Barium in the Environment

- Barium enters the environment naturally through the weathering of rocks and minerals. Anthropogenic releases are primarily associated with industrial processes.
- In the atmosphere, barium is likely to present in particulate form and is primarily removed by wet and dry deposition.
- In aquatic media, barium is likely to precipitate out of solution as an insoluble salt.

- Barium is not very mobile in most soil systems due to the formation of water-insoluble salts and the inability of barium to form soluble complexes with fulvic and humic acids.
- Barium has the potential to bio-concentrate in marine animals and plants and in some terrestrial plants such as legumes, forage plants, Brazil nuts, and mushrooms.

BENZENE

Benzene is a colorless liquid

- Benzene, also known as benzol, has a sweet odor.
- Benzene is highly flammable.
- Benzene is made mostly from petroleum sources. Various industries use benzene to make other chemicals, such as styrene (for Styrofoam® and other plastics), cumene (for various resins), and cyclohexane (for nylon and synthetic fibers).
- Benzene is also used for the manufacturing of some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides.
- Benzene is also a natural component of crude oil, gasoline and cigarette smoke.

Benzene in the Environment

- Benzene enters the air, water, and soil as a result of industrial processes, emissions from burning coal and oil, tobacco smoke, gasoline exhaust and gasoline leaks, and from natural sources including volcanoes and forest fires.
- Benzene in the atmosphere chemically degrades in only a few days.
- Benzene released to soil or waterways is subject to volatilization, photooxidation, and biodegradation.

CARBON DISULFIDE

What is carbon disulfide?

Pure carbon disulfide is a colorless liquid with a pleasant odor that is like the smell of chloroform. The impure carbon disulfide that is usually used in most industrial processes is a yellowish liquid with an unpleasant odor, like that of rotting radishes. Carbon disulfide evaporates at room temperature, and the vapor is more than twice as heavy as air. It easily explodes in air and also catches fire very easily. In nature, small amounts of carbon disulfide are found in gases released to the earth's surface as, for example, in volcanic eruptions or over marshes. Commercial carbon disulfide is made by combining carbon and sulfur at very high temperatures.

What happens to carbon disulfide when it enters the environment?

- The amount of carbon disulfide released into the air through natural processes is difficult to judge because it is so small.
- Carbon disulfide evaporates rapidly when released to the environment.
- Most carbon disulfide in the air and surface water is from manufacturing and processing activities.
- It is found naturally in coastal and ocean waters.
- Carbon disulfide does not stay dissolved in water very long, and it also moves through soils fairly quickly.
- Carbon disulfide does not appear to be taken up in significant amounts by the organisms living in water.

CADMIUM

What is cadmium?

Cadmium is a natural element in the earth's crust. It is usually found as a mineral combined with other elements such as oxygen (cadmium oxide), chlorine (cadmium chloride), or sulfur (cadmium sulfate, cadmium sulfide). All soils and rocks, including coal and mineral fertilizers, contain some cadmium. Most cadmium used in the United States is extracted during the production of other metals like zinc, lead, and copper. Cadmium does not corrode easily and has many uses, including batteries, pigments, metal coatings, and plastics.

What happens to cadmium when it enters the environment?

- Cadmium enters soil, water, and air from mining, industry, and burning coal and household wastes.
- Cadmium does not break down in the environment, but can change forms.
- Cadmium particles in air can travel long distances before falling to the ground or water.
- Some forms of cadmium dissolve in water.
- Cadmium binds strongly to soil particles.
- Fish, plants, and animals take up cadmium from the environment.

CHROMIUM

What is chromium?

Chromium is a naturally occurring element found in rocks, animals, plants, and soil. It can exist in several different forms. Depending on the form it takes, it can be a liquid, solid, or gas. The

most common forms are chromium(0), chromium(III), and chromium(VI). No taste or odor is associated with chromium compounds. The metal chromium, which is the chromium(0) form, is used for making steel. Chromium(VI) and chromium(III) are used for chrome plating, dyes and pigments, leather tanning, and wood preserving.

What happens to chromium when it enters the environment?

- Chromium can be found in air, soil, and water after release from the manufacture, use, and disposal of chromium-based products, and during the manufacturing process.
- Chromium does not usually remain in the atmosphere, but is deposited into the soil and water.
- Chromium can easily change from one form to another in water and soil, depending on the conditions present.
- Fish do not accumulate much chromium in their bodies from water.

DI-*n*-BUTYL PHTHALATE

What is di-*n*-butylphthalate?

Di-*n*-butyl phthalate is a manufactured chemical that does not occur naturally. It is an odorless and oily liquid that is colorless to faint yellow in color. It is slightly soluble in water and does not evaporate easily. Di-*n*-butyl phthalate is used to make plastics more flexible and is also in carpet backings, paints, glue, insect repellents, hair spray, nail polish, and rocket fuel.

What happens to di-*n*-butylphthalate when it enters the environment?

- Di-*n*-butyl phthalate is released to air as a vapor. It can react with other chemicals in the air and is usually broken down within a few days. Di-*n*-butyl phthalate can also attach to particles in the air and eventually settle to the land and water.
- Most of the di-*n*-butyl phthalate in water attaches to sediment and settles out of the water or is broken down by bacteria. Small amounts may evaporate to the air.
- When released to the soil, it attaches to soil particles and is broken down by bacteria.
- There is no evidence that it builds up in the food chain.

DIETHYL PHTHALATE

What is diethyl phthalate?

Diethyl phthalate is a colorless liquid that has a bitter, disagreeable taste. This synthetic substance is commonly used to make plastics more flexible. Products in which it is found include toothbrushes, automobile parts, tools, toys, and food packaging. Diethyl phthalate can

be released fairly easily from these products, as it is not part of the chain of chemicals (polymers) that makes up the plastic. Diethyl phthalate is also used in cosmetics, insecticides, and aspirin.

What happens to diethyl phthalate when it enters the environment?

- Diethyl phthalate has been found in waste sites and landfills from discarded plastics.
- It may break down in the air.
- It can become attached to particles of dust in the air, and can settle out.
- It is broken down to harmless products by microorganisms in soil and water.
- Small amounts of it can build up in fish and shellfish living in water containing it.

ETHYLBENZENE

Ethylbenzene is a liquid

- Ethylbenzene is a colorless liquid with an aromatic odor.
- Ethylbenzene is flammable and combustible.
- It is naturally found in crude petroleum.
- It is a high production volume chemical primarily used for the production of styrene.

Ethylbenzene in the Environment

- Ethylbenzene partitions primarily to air and removal via photochemically generated hydroxyl radicals is an important degradation mechanism.
- The half-life in air is approximately 1-2 days.
- In surface water, most of the ethylbenzene will evaporate. The remaining ethylbenzene is broken down through photooxidation and biodegradation.
- Ethylbenzene is moderately mobile in soil.
- Ethylbenzene does not appear to bioconcentrate in aquatic food chains

MERCURY

What is mercury?

Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas. Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts," which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common one, methylmercury, is produced mainly by

microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make. Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, dental fillings, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.

What happens to mercury when it enters the environment?

- Inorganic mercury (metallic mercury and inorganic mercury compounds) enters the air from mining ore deposits, burning coal and waste, and from manufacturing plants.
- It enters the water or soil from natural deposits, disposal of wastes, and volcanic activity.
- Methylmercury may be formed in water and soil by small organisms called bacteria.
- Methylmercury builds up in the tissues of fish. Larger and older fish tend to have the highest levels of mercury.

METHYL *TERT*-BUTYL ETHER

What is methyl *tert*-butyl ether?

Methyl *tert*-butyl ether (MTBE) is a flammable liquid with a distinctive, disagreeable odor. It is made from blending chemicals such as isobutylene and methanol, and has been used since the 1980s as an additive for unleaded gasoline to achieve more efficient burning. MTBE is also used to dissolve gallstones. Patients treated in this way have MTBE delivered directly to their gall bladders through special tubes that are surgically inserted.

What happens to MTBE when it enters the environment?

- MTBE quickly evaporates from open containers and surface water, so it is commonly found as a vapor in the air.
- Small amounts of MTBE may dissolve in water and get into groundwater.
- It remains in underground water for a long time.
- MTBE may stick to particles in water, which will cause it to eventually settle to the bottom sediment.
- MTBE may be broken down quickly in the air by sunlight.
- MTBE does not build up significantly in plants and animals.

POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)

What are polycyclic aromatic hydrocarbons?

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot. Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks
- PAHs enter water through discharges from industrial and wastewater treatment plants.
- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

LEAD

Lead is a metal

- Lead is a naturally-occurring bluish-gray metal that is rarely found in its elemental form, but occurs in the Earth's crust primarily as the mineral galena (PbS), and to a lesser extent as anglesite ($PbSO_4$) and cerussite ($PbCO_3$).
- Lead is not a particularly abundant element, but its ore deposits are readily accessible and widely distributed throughout the world. Its properties, such as corrosion resistance,

density, and low melting point, make it a familiar metal in pipes, solder, weights, and storage batteries.

- Natural lead is a mixture of four stable isotopes, ^{208}Pb (51–53%), ^{206}Pb (23.5– 27%), ^{207}Pb (20.5–23%), and ^{204}Pb (1.35–1.5%). Lead isotopes are the stable decay product of three naturally radioactive elements: ^{205}Pb from uranium, ^{207}Pb from actinium, and ^{208}Pb from thorium.

Lead in the Environment

- Lead is dispersed throughout the environment primarily as the result of anthropogenic activities. In the air, lead is in the form of particles and is removed by rain or gravitational settling.
- The fate of lead in soil is affected by the adsorption at mineral interfaces, which are dependent upon physical and chemical characteristics of the soil (e.g., pH, soil type, particle size, organic matter content).
- Sources of lead in dust and soil can include lead from weathering and chipping of lead-based paint from buildings, bridges, and other structures.
- The solubility of lead compounds in water is a function of pH, hardness, salinity, and the presence of humic material. Solubility is highest in soft, acidic water.

PHENOL

What is phenol?

Phenol is both a manufactured chemical and a natural substance. It is a colorless-to-white solid when pure. The commercial product is a liquid. Phenol has a distinct odor that is sickeningly sweet and tarry. You can taste and smell phenol at levels lower than those that are associated with harmful effects. Phenol evaporates more slowly than water, and a moderate amount can form a solution with water. Phenol is used primarily in the production of phenolic resins and in the manufacture of nylon and other synthetic fibers. It is also used in slimicides (chemicals that kill bacteria and fungi in slimes), as a disinfectant and antiseptic, and in medicinal preparations such as mouthwash and sore throat lozenges.

What happens to phenol when it enters the environment?

- Following small, single releases, phenol is rapidly removed from the air (generally, half is removed in less than a day).
- Phenol generally remains in the soil only about 2 to 5 days.

- Phenol can remain in water for a week or more.
- Larger or repeated releases of phenol can remain in the air, water, and soil for much longer periods of time.
- Phenol does not build up in fish, other animals, or plants

SELENIUM

What is selenium?

Selenium is a naturally occurring mineral element that is distributed widely in nature in most rocks and soils. In its pure form, it exists as metallic gray to black hexagonal crystals, but in nature it is usually combined with sulfide or with silver, copper, lead, and nickel minerals. Most processed selenium is used in the electronics industry, but it is also used: as a nutritional supplement; in the glass industry; as a component of pigments in plastics, paints, enamels, inks, and rubber; in the preparation of pharmaceuticals; as a nutritional feed additive for poultry and livestock; in pesticide formulations; in rubber production; as an ingredient in antidandruff shampoos; and as a constituent of fungicides. Radioactive selenium is used in diagnostic medicine.

What happens to selenium when it enters the environment?

- Selenium occurs naturally in the environment and can be released by both natural and manufacturing processes.
- Selenium dust can enter the air from burning coal and oil. This selenium dust will eventually settle over the land and water.
- It also enters water from natural deposits in rocks and soil, and from agricultural and industrial waste. Some selenium compounds will dissolve in water, and some will settle to the bottom as particles.
- Insoluble forms of selenium will remain in soil, but soluble forms are very mobile and may enter surface water from soils.
- Selenium may accumulate up the food chain.

STYRENE

What is styrene?

Styrene is a colorless liquid that evaporates easily and has a sweet smell. It often contains other chemicals that give it a sharp, unpleasant smell. Styrene is widely used to make plastics and rubber. Products containing styrene include insulation, fiberglass, plastic pipes, automobile parts, shoes, drinking cups and other food containers, and carpet backing. Most of these

products contain styrene linked together in a long chain (polystyrene) as well as unlinked styrene. Low levels of styrene also occur naturally in a variety of foods such as fruits, vegetables, nuts, beverages, and meats. In addition, small amounts of styrene can be transferred to food from styrene-based packaging material.

What happens to styrene when it enters the environment?

- Styrene can be found in air, water, and soil after release from the manufacture, use, and disposal of styrene-based products.
- It is quickly broken down in the air, usually within 1 to 2 days.
- Styrene evaporates from shallow soils and surface water. Styrene that remains in soil or water may be broken down by bacteria or other microorganisms.
- Styrene is not expected to build up in animals.

XYLENES

Xylene is a colorless liquid

- Xylene is a colorless, flammable liquid with a somewhat sweet odor.
- Xylene evaporates and burns easily.
- Xylenes (mixtures of ortho-, meta-, and para-isomers) are used as industrial solvents, synthetic intermediates, and solvents in commercial products such as paints, coatings, adhesive removers, and paint thinners; they are also a component of gasoline.
- Xylene occurs naturally in petroleum and coal tar and is formed during forest fires.

Xylene in the Environment

- Xylene released to the atmosphere is quickly transformed by photooxidation with a half-life of approximately 8–14 hours.
- When released to soil or surface water, xylene volatilizes into the atmosphere, where it is quickly degraded.
- Xylene that does not volatilize quickly may undergo biodegradation in the soil or water.
- Xylene may also leach into groundwater, where degradation by microbes becomes the primary removal process.

ATTACHMENT 2

WEST HAYMARKET REDEVELOPMENT SITE **FORM ECP-1**

ENVIRONMENTAL CONTINGENCY PLAN

WORK ACTIVITY:

PROJECT MANAGER/CONTRACTOR'S REPRESENTATIVE:

DATES OF CONSTRUCTION:

ATTACHMENTS (LIST):

SPECIAL PRECAUTIONS:

CERTIFICATION

By signing this certification, I acknowledge on behalf of _____ (organization) that I have received a copy of the WHRS ECP, understand the obligations and procedures relevant to my organization's planned work activity and agree to abide by any and all special precautions described above. Deviations to planned work activities and special precautions will be coordinated with the City of Lincoln's Environmental Project Management Team's Technical Representative (TR).

Organizational Representative

(Print Name and Title): _____

Signature/Date: _____

EPMT TR: _____

Signature/Date: _____

WEST HAYMARKET REDEVELOPMENT SITE

FORM ECP-2

ENVIRONMENTAL CONTINGENCY PLAN

WORK ACTIVITY:

PROJECT MANAGER/CONTRACTOR'S REPRESENTATIVE:

DATE OF ECP-1 AND ANY SUPPLEMENTS:

ATTACHMENTS (LIST) INCLUDING ANY PHOTO LOG:

OBSERVATION(S):

CORRECTIVE ACTION(S):

EPMT TR: _____

Signature/Date: _____

ATTACHMENT 3

Soil Management Guidance

On-Site Utilities, Grading Work, and Geotechnical Boring Soil:

- Generation of spoils is not considered active management, can be replaced in the excavation/hole
- Excess spoils should be containerized, or if stockpiled, an Area of Contamination (AOC) designation should be requested (use of plastic sheeting not acceptable)
- Soil must be sampled either "as generated" with reasonable sampling frequency **OR** pre-characterized with densely-spaced horizontal and vertical in-situ sampling
- Soil must be tested before taken off-site using either the TCLP method **OR** a totals analysis with moisture content (100% dry solids if 20 to 1 rule used)
    - Visual/olfactory evidence alone cannot be used
- Soil to be used as fill must be tested and contain contaminants at levels less than those listed on the Voluntary Cleanup Program Lookup Tables, or otherwise demonstrate that use of fill would be protective of human health and the environment

On-Site Unsuitable Geotechnical Material Soil:

- Excess spoils should be containerized, or if stockpiled, an Area of Contamination (AOC) designation should be requested (use of plastic sheeting not acceptable)
- Soil must be sampled either "as generated" with reasonable sampling frequency **OR** pre-characterized with densely-spaced horizontal and vertical in-situ sampling
- Soil must be tested before taken off-site using either the TCLP method **OR** a totals analysis with moisture content (100% dry solids if 20 to 1 rule used)
    - Visual/olfactory evidence alone cannot be used
- Soil to be used as fill must be tested and contain contaminants at levels less than those listed on the Voluntary Cleanup Program Lookup Tables, or otherwise demonstrate that use of fill would be protective of human health and the environment

On-Site Investigation Derived Waste and Remediation Waste Soil:

- Must be containerized and tested
- Soil must be sampled either "as generated" with reasonable sampling frequency **OR** pre-characterized with densely-spaced horizontal and vertical in-situ sampling **OR** based on collected environmental sample from groundwater or soil (soil sample must be representative of entire soil boring column)
- Soil must be tested before taken off-site using either the TCLP method **OR** a totals analysis with moisture content (100% dry solids if 20 to 1 rule used)
    - Visual/olfactory evidence alone cannot be used
- Soil to be used as fill must be tested and contain contaminants at levels less than those listed on the Voluntary Cleanup Program Lookup Tables, or otherwise demonstrate that use of fill would be protective of human health and the environment

Off-Site Utilities and Road Construction Soil:

- Generation of spoils is not considered active management, can be replaced in the excavation/hole
- Stockpiling of excess spoils and use of visual/olfactory evidence for soil characterization is acceptable **unless** there is knowledge of contamination in the area, then sampling must be done as described above for on-site utilities work
    - This knowledge may be acquired by conducting a records search of the Nebraska Department of Environmental Quality files
- If contamination is encountered during construction, the contaminated soil must be managed as described above for on-site utilities work
- Soil to be used as fill must be tested and contain contaminants at levels less than those listed on the Voluntary Cleanup Program Lookup Tables, or otherwise demonstrate that use of fill would be protective of human health and the environment

SPECIAL WASTE DISPOSAL PERMIT

Tuesday, November 09, 2010

Lincoln-Lancaster County Health Department
Special Waste Program
3140 N Street
Lincoln, Nebraska 68510
(402) 441-8021

18355-001-8C

JOINT PUBLIC AGENCY-HAYMARKET ARENA
555 S 10TH ST
ROOM 111
LINCOLN, NE 68508

Generator:

JOINT PUBLIC AGENCY-HAYMARKET ARENA

Facility:

JOINT PUBLIC AGENCY-HAYMARKET ARENA
555 S 10TH ST
ROOM 111
LINCOLN, NE 68508

Contact Information:

MIKI ESPOSITO
PW LIAISON & COMPLIANCE

DATE ISSUED: 11/09/2010 **DATE EXPIRES:** 08/01/2012

The following permits are granted for the disposal of Special Wastes at the sites shown below. These permits were issued based on the waste description information provided on the permit application . Any substantial change in the nature of the waste from that described in the permit application, will invalidate the permit. Failure to comply with the General Permit Conditions or special conditions described on this permit will invalidate the permit.

PERMIT NUMBER: 10-18355-001-10-09 **HAULER:** NO DESIGNATED HAULER

WASTE TYPE: 10 PETROLEUM CONTAMINATED REFUSE (A. FILTERS, B. SHOP RAGS, C. SOIL, D. ABSORBENTS, OR E. OTHER MATERIAL)

WASTE DESCRIPTION: SOIL FROM EAST-CENTRAL (FUEL DEPOT) & WEST GRADING AREA

DISPOSAL SITE: BLUFF ROAD LANDFILL ONLY

SPECIAL CONDITIONS: *** PETROLEUM-CONTAMINATED SOIL GENERATED AT THE FUEL RELEASE SITE NEAR THE EAST-CENTRAL AREA NEAR THE FORMER FUELING STATION. SOIL MAY ALSO BE GENERATED FROM OTHER AREAS (DETAILED MAP ON FILE AT LLCHD).

THIS PERMIT EXCLUDES CONTAMINATED SOILS THAT MAY BE ENCOUNTERED AT THE FORMER ROUNDHOUSE AND THE FORMER UPRR TURNTABLE. ***

*** PLEASE NOTE THE FOLLOWING INFORMATION CONCERNING YOUR PERMIT ***

WASTE DISPOSED UNDER THIS PERMIT IS TO BE DIRECTED TO BLUFF ROAD LANDFILL ONLY!

PERMIT VALID FOR THE WASTE TYPE AND SOURCE LOCATION DESCRIBED ABOVE ONLY. PERMIT DOES NOT AUTHORIZE DISPOSAL OF HAZARDOUS WASTE. GENERATOR IS RESPONSIBLE FOR DETERMINING IF WASTE IS HAZARDOUS. ALL LOADS SUBJECT TO INSPECTION.

WASTE IN THIS CATEGORY MAY NOT CONTAIN "FREE PETROLEUM PRODUCT" OR OTHER LIQUIDS.

PLEASE CONTACT TINA BAKER AT THE LANDFILL AT 441-8102 BEFORE INITIATING THE FIRST LOADS OF WASTE TO DISCUSS QUANTITIES AND TIME SCHEDULES OF DELIVERY.

A COPY OF THIS PERMIT MUST ACCOMPANY ALL LOADS.

ALL LOADS TRAVERSING LANCASTER COUNTY ROADS AND/OR ENTERING THE LANDFILL MUST BE COVERED/TARPED.

STATE OF NEBRASKA

Dave Heineman
Governor

DEPARTMENT OF ENVIRONMENTAL QUALITY
Michael J. Linder
Director
Suite 400, The Atrium
1200 'N' Street
P.O. Box 98922
Lincoln, Nebraska 68509-8922
Phone (402) 471-2186
FAX (402) 471-2909
website. www.deq.state.ne.us

FEB 18 2011

Mr. Chad Blahak
City of Lincoln
Public Works/ Engineering Services
555 South 10th Street
Lincoln, NE 68508

RE: Dewatering Authorization Restrictions Under General National Pollutant Discharge Elimination System (NPDES) NEG671000 for Lincoln Haymarket/Arena Construction
(Area bounded by 2nd Street, Salt Creek Street, 8th Street, and J Street, Lincoln, NE)

Dear Mr. Blahak,

This letter provides requirements for continued authorization under the Department of Environmental Quality's General NPDES Permit for Construction Dewatering (NEG671000). Due to the known pollutants present in groundwater and soils in this area, additional restrictions will be required in order to protect surface water.

The general permit cannot authorize discharge that in accordance with Part I. C of the permit may create potential water quality impacts on the receiving stream. In addition, in accordance with Part IV.B, the permit prohibits toxic discharges. Known toxics have been determined to be present on this site, and therefore, unless there is further analysis of the dewatering water, it cannot be authorized by this permit to discharge. In order to determine whether or not an authorized discharge can take place, the water must be analyzed prior to discharge. Therefore, to continue authorization under NPDES General Permit NEG67100, all work requiring dewatering discharges must:

1. Containerize the dewatering water.
2. Test each container for the constituents found in Table 1, 2, and 3.
3. Test results must be completed and compared to maximum discharge levels found in Table 1, 2, and 3.
4. If all test results are below maximum discharge levels found in Table 1, 2, and 3 discharge authorization is continued under the NPDES General Permit NEG671000. All other terms and conditions of the permit continue to apply.
5. If any test result is above maximum discharge levels found in Table 1, 2, and 3, the discharge is no longer authorized under the NPDES General Permit NEG671000 and is prohibited from direct discharge. Alternate disposition and /or treatment are required.
    a. Approval from a municipal wastewater treatment facility (WWTF) is required prior to discharging to the WWTF. Please be advised that some of the pollutants found on this site may adversely affect the quality of biosolids from the WWTF.
    b. Any type of treatment on site will require a site-specific NPDES permit applicable to the type of treatment and the pollutants treated. A site specific application for this permit will be required. (Form 1 and 2C)
    c. Treatment can be performed by an off-site facility that is designed, permitted, and approved to treat the pollutants present.

6. Test results shall be recorded on the attached Discharge Monitoring Reports (DMR) and submitted to the Department on a quarterly basis. Reports can be sent to the address at the end of the DMR form.

Table 1: Requirements for Dieldrin, PCBs, and TPH

Parameters	Storet #	Units	Maximum Discharge Levels	Frequency	Sample Type
Dieldrin	39380	µg/L	0.00144	Once/batch	Grab
Polychlorinated Biphenyls	39516	µg/L	0.0017	Once/batch	Grab
Total Petroleum Hydrocarbons	82180	mg/L	10	Once/batch	Grab

Table 2: Requirements for Metals

Parameters	Storet #	Units	Maximum Discharge Levels	Monitoring Frequency	Sample Type
Arsenic, Total Recoverable	00978	µg/L	16.7	Once/batch	Grab
Cadmium, Total Recoverable	01113	µg/L	0.527	Once/batch	Grab
Chromium (III), Total Recoverable	04262	µg/L	189.5	Once/batch	Grab
Chromium (VI), Total Recoverable	78247	µg/L	11.0	Once/batch	Grab
Lead, Total Recoverable	01114	µg/L	8.1	Once/batch	Grab
Mercury, Total Recoverable	71901	µg/L	0.77	Once/batch	Grab
Selenium, Total Recoverable	00981	µg/L	5.0	Once/batch	Grab

Table 3: Requirements for Polycyclic Aromatic Hydrocarbons					
Parameters	Storet #	Units	Maximum Discharge Levels	Monitoring Frequency	Sample Type
Benzo(a)antracene	34526	µg/L	0.49	Once/batch	Grab
Benzo(a)pyrene	34247	µg/L	0.49	Once/batch	Grab
Benzo(b)fluoranthene	34230	µg/L	0.49	Once/batch	Grab
Benzo(k)fluoranthene	34242	µg/L	0.49	Once/batch	Grab
Chrysene	34320	µg/L	0.49	Once/batch	Grab
Dibenzo(a,h)anthracene	34556	µg/L	0.49	Once/batch	Grab
Indeno(1,2,3-cd)pyrene	34403	µg/L	0.49	Once/batch	Grab
Naphthalene	34696	µg/L	620	Once/batch	Grab

These additional restrictions must be satisfied to qualify for authorization under the NPDES General Dewatering Permit NEG 671000 for construction dewatering activity in the area bounded by 2nd Street, Salt Creek Street, 8th Street and J Street, Lincoln, NE and are effective immediately. Please contact me if you have questions.

Sincerely,

Donna K. Garden

Donna K. Garden, Supervisor
NPDES Permits and Compliance Unit
Wastewater Section
402-471-1367
donna.garden@nebraska.gov

cc: T. J. Osborn Construction, 5801 Johanna Road, Lincoln, Nebraska 68507 (402-464-4235)
Frank Uhlarik , Alfred Benesch and Co., 825 J Street, PO Box 80358, Lincoln, Nebraska 68501
Miki Esposito, City of Lincoln, 555 South 10th Street, Lincoln, NE 68508

Nebraska Department of Environmental Quality

Wastewater Section
1200 'N' Street, Suite 400, The Atrium
PO Box 98922
Lincoln, NE 68509-8922
Tel. 402/471-4220
(a) Fax 402/471-2909

DW-DMR

Dewater Discharges Discharge Monitoring Report (DMR) Authorized Under NPDES General Permit NEG671000

This DW-DMR is to be submitted monthly (i.e., within 28 days after the end of each calendar month), unless alternative submittal arrangements are approved. Any pH, Oil & Grease, or Total Suspended Solids monitoring results that are not in compliance with the permit effluent limits shall be reported to the Department within 24 hours (Telephone 402/471-4220) and a written non-compliance report must be submitted within 7 days (See Appendix A, Sections D.2 and D.3 in the permit). If the appropriate information is included on this form, it may be used as a non-compliance report form and to provide notification of project completion. Be sure to fill in all of the appropriate blanks below and sign on the back of this form.

NPDES Tracking Number: NEG671 ___ ___ ___ - R

Project Owner or Operator: _____

Project Name & Location: _____

When is the discharge anticipated to begin? (mo/day/yr) _____

What is the Outfall Designations:_____

What is the Source of the outfall? (i.e. well, pit, foundation pump, etc.)_____

_____

Discharge Monitoring Report_____ Date_____

Site_____

Parameter	Discharge Limit	Unit	Monitoring Result	Unit	Sample Type
Volume Discharged	Report	Gallons			
Dieldrin	0.00144	µg/L			
Polychlorinated Biphenyls	0.0017	µg/L			
Total Petroleum Hydrocarbons	10.0	mg/L			

Parameter	Discharge Limit	Unit	Monitoring Result	Unit	Sample Type
Arsenic, Total Recoverable	16.7	µg/L			
Cadmium, Total Recoverable	0.527	µg/L			
Chromium (III), Total Recoverable	189.0	µg/L			
Chromium (VI), Total Recoverable	11.0	µg/L			
Lead, Total Recoverable	8.1	µg/L			
Mercury, Total Recoverable	0.77	µg/L			
Selenium, Total Recoverable	5.0	µg/L			

Parameter	Discharge Limit	Unit	Monitoring Result	Unit	Sample Type
Benzo(a)anthracene	0.49	µg/L			
Benzo(a)pyrene	0.49	µg/L			
Benzo(f)fluoranthene	0.49	µg/L			
Benzo(k)fluoranthene	0.49	µg/L			
Chrysene	0.49	µg/L			
Dibenzo(a,h)anthracene	0.49	µg/L			
Indeno(1,2,3-cd)pyrene	0.49	µg/L			
Naphthalene	620	µg/L			

Certification

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

Owner or Operator Signature or Authorized Representative**	**Date Signed**
Print Name	**Title**

For Information on the submittal of the DW-DMR see page 4.

The qualifications and responsibilities of the authorized representative are described on page 4.

Requirements for and Responsibilities of Owner/Operator and Authorized Representative

The "**owner or operator**" is responsible for signing all permit applications and must meet the requirements set forth in NDEQ Title 119 Chapter, 13 002:

"All permit applications submitted to the Department shall be signed:

002.01 – For a corporation, by a responsible corporate officer;

002.02 - For a partnership or a sole proprietorship by a general partner or the proprietor; and

002.03 - For a municipal, State, Federal, or other public facility by either a principal executive officer or ranking elected official."

The "**authorized representative**" is the primary facility contact for correspondence and monitor reporting, and must meet the requirements set forth in NDEQ Title 119, Chapter 13 003:

"All other correspondence, reports and DMR's shall be signed by a person designated in 001.01 through 001.04 above or a duly authorized representative if such representative is responsible for the overall operation of the facility from which the discharge originates; the authorization is made in writing by the person designated under 001.01 through 001.03 above; and the written authorization is submitted to the Director."

Submit the completed DW-DMR form to one of the following addresses:

US Postal Service Address

Wastewater Section
Nebraska Department of Environmental Quality
PO Box 98922
Lincoln, NE 68509-8922

Alternate Carrier Address

Wastewater Section
Nebraska Department of Environmental Quality
The Atrium, 1200 N Street, Suite 400
Lincoln, NE 68509

WEST HAYMARKET JOINT PUBLIC AGENCY (2011)
HAYMARKET INFRASTRUCTURE IMPROVEMENTS
INITIAL HAYMARKET SITE PREPARATION
PROJECT NO. 870703

GENERAL CONTRACT REQUIREMENTS

The work as detailed on the plans shall be completed in accordance with the requirements of the 2006 City of Lincoln Standard Specifications for Municipal Construction, as supplemented by the Nebraska Department of Road's 2007 Standard Specifications for Highway Construction. The 2006 City of Lincoln Standard Specifications for Municipal Construction and the Nebraska Department of Road's 2007 Standard Specifications for Highway Construction (NDOR Standard Specifications), including all amendments, Supplemental Specifications and additions thereto effective at the date of the contract, the Special Provisions, plans, and all supplementary documents are essential parts of the contract. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete project

In case of a discrepancy:

1. Special Provisions shall govern over the City of Lincoln Standard Specification for Municipal Construction.
2. The Special Provisions shall govern over the Plans.

The Contractor shall not take advantage of any apparent error or omission in the plans or specifications. Upon discovery of such an error or omission, the Contractor shall notify the Engineer immediately. The Engineer will then make such corrections or interpretations as necessary to fulfill the intent of the plans and specifications.

Materials or work described in words which, so applied, have known technical or trade meaning shall be held to refer to such recognized standards.

Figured dimensions on the plans shall be taken as correct but shall be checked by the Contractor before starting construction. Any errors, omissions, or discrepancies shall be brought to the attention of the Engineer and the Engineer's decision thereon shall be final. Correction of errors or omissions on the drawings or specifications may be made by the Engineer when such correction is necessary for the proper execution of the work

Any reference the City, or OWNER, in the City of Lincoln Standard Specifications for Municipal Construction shall be considered reference to the West Haymarket Joint Public Agency (JPA), its employees, or representatives hired by the JPA as a consultant for construction project management, observation or testing services. The JPA's address is 555 South 10th Street, Lincoln, Nebraska 68508.

JPA: JPA shall mean the West Haymarket Joint Public Agency, a joint administrative entity under the Interlocal Cooperation Act, comprised of the City of Lincoln and the University of Nebraska – Lincoln for the purpose of implementing and overseeing the operation of the West Haymarket arena and infrastructure improvement projects.

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PROJECT TIES

This project is tied to the following project.

JPA Project Number	**Description**
870303	West Haymarket Joint Public Agency (2011) USPS Parking Lot Reconstruction Project

This project and the above referenced JPA Project(s) will be advertised for bids on the same date. Bids for this project and all projects listed above will be received and opened on the same day as shown on the invitation to bid for the projects.

In order to be eligible for award of this contract, bidders shall submit a completed bidding proposal for this job and all jobs listed.

Award of Contract, if awarded, will be made on the combined bid for all contracts. Separate contracts will be awarded for each project.

The bid amount for Mobilization cannot exceed ten percent of the total bid amount for the individual contract in which it is bid.

BONDING PERIOD

The City of Lincoln Standard Specifications, General Provisions and Requirements has been amended as follows:

Award and Execution of Contract.

B. Construction Performance and Construction Payment Bonds and Execution of Contract.

Within **five (5) days** after the acceptance of the bid, the successful Bidder must execute a written Contract between the Bidder and the JPA, said Contract will incorporate the JPA's Contract Documents and be on forms provided by the JPA, Construction Performance and Construction Payment Bonds, in a sum not less than the contract price, executed by the Bidder and by a corporate surety company authorized to transact business in the State of Nebraska.

SALES TAX

This language modifies and clarifies Section VI, Paragraph S of the General Conditions and Requirements of the City of Lincoln's 2006 Standard Specification for Municipal Construction.

Sales and Uses Tax

Any portion of this project used for providing water service, such as pipe and fittings for water mains, is subject to sales and use taxes.

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The remainder of this project, including items exclusively used for providing fire protection, such as fire hydrants, are exempt from sales and use taxes.

No one shall issue the Purchasing Agent Appointment (PAA) certificate forms except the Purchasing Agent. When the contractor requests these forms they need to inform the Purchasing Agent what materials they are buying and for which project (identify with project description and number).

SUBSTANTIAL AND FINAL COMPLETION

Work on this project has been broken down into two separate contract phases in regard to determination of substantial final completion. Each of these contract phases may include portions of or all of the work as shown on the plans for various construction phases.

- Contract Phase A – includes all work associated with the site preparation including building demolition, site grading/over-excavation, utilities, shoring and embankment work between approximate Station 2107+50 to Station 2121+00 (the area from the south side of "R" Street, north through the area where the new arena will be constructed). This contract phase also includes the construction of the new access road between 7th and "T" Street and 8th and Arena Drive as well as the new paving and utilities along "R" Street. This generally includes all work associated with Construction Phase I (consisting of sub-phases IA, IB and IC).
- Contract Phase B – includes the remaining site preparation, site utilities and grading/over-excavation, embankment construction and final site stabilization work between approximate Stations 2096+00 and Station 2107+50. This generally includes all work shown on Construction Phase II.

The contract phases on this project will have separate substantial completion dates as outlined below. The substantial and final completion dates for each of the contract phases are based upon the Contractor receiving a notice to proceed with the project on or before May 9, 2011. Furthermore, substantial completion of the contract phases is based upon the City having acquired all right-of-way or obtained a right-of-entry to all tracts by the anticipated acquisition dates shown in the Status of Right-of-Way or the Notice to Proceed date, which ever date is later.

Upon receipt of a notice to proceed with work on the project the Contractor shall be allowed to begin utility work at the project site including storm sewer construction, water main construction and sanitary sewer construction. In addition the Contactor will be allowed to begin over-excavation work to remove unsuitable material and to rework and compact the existing subgrade soils that are to remain in place. No off-site fill material will be allowed to be brought onto the site until May 23, 2011. This date is contingent upon final NDEQ approval of the Remedial Action Plan for the initial site preparation site. In addition work at the USPS property cannot begin until an agreement is in place with the USPS or a right-of-entry has been secured for work on this property. It is anticipated that an agreement will be in place or right-of-entry secured at the USPS property by May 31, 2011.

Substantial completion for Contract Phase A shall mean the completion of all work associated with construction of the new roadway and utilities along "R" Street from the east side of 7th Street west into the new West Haymarket area and the roadway is opened to traffic and access to the new arena site; completion of the storm sewer, sanitary sewer and water main construction

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from the south side of "R" Street north through the limits of the new arena site; installation of initial site erosion and sediment controls; over-excavation, embankment construction and grading work at the area outlined for Phase IA and IB work; building and other site demolitions; well abandonment; construction of the north access road to the site from 8th and Arena Drive; and construction/removal of the surcharge at the arena site. Substantial/final completion for this contract phase shall be on or before September 15, 2011 at which time the arena contractor will have access to the site to begin construction of the pilings and foundations for the structure.

Substantial completion for Contract Phase B shall mean the completion of all work associated with the site preparation work for the initial West Haymarket area between "O" Street and "R" Street. This shall include construction of the new sanitary sewers and water mains; over-excavation, embankment construction and grading work at the area outlined for Phase II work; and final site stabilization. Substantial completion for this contract phase shall be on or before November 11, 2011.

Final completion of all work including permanent seeding, site clean-up, and all other incidental work required to provide a complete and functional project for Contract Phases A and B shall be completed by December 9, 2011. Determination of Substantial Completion and Final Completion shall be subject to Engineer's approval.

Notice to Proceed with work on this project is anticipated to be given to the Contractor on or before May 9, 2011. It is imperative that the Contractor is ready to begin utility work including storm sewer and sanitary sewer construction at the area from "R" Street to the north as soon as possible upon receipt of the notice to proceed.

SPECIAL BIDDING CONDITIONS
(Liquidated Damages)

This project has been broken down into two contract phases in regard to liquidated damages as shown below. Each of these contract phases may include portions of or all of the work as shown on the plans for various construction phases.

- Contract Phase A – includes all work associated with the site preparation including building demolition, site grading/over-excavation, utilities, shoring and embankment work between approximate Station 2107+50 to Station 2121+00 (the area from the south side of "R" Street, north through the area where the new arena will be constructed). This contract phase also includes the construction of the new access road between 7th and "T" Street and 8th and Arena Drive as well as the new paving and utilities along "R" Street. This generally includes all work associated with Construction Phase I (consisting of sub-phases IA, IB and IC).
- Contract Phase B – includes the remaining site preparation, site utilities and grading/over-excavation, embankment construction and final site stabilization work between approximate Stations 2096+00 and Station 2107+50. This generally includes all work shown on Construction Phase II.

Contract Phase A

If the Contractor fails to complete all work associated with the substantial/final completion of Contract Phase A of the Project by September 15, 2011, considering

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approved extensions of time for this contract phase, liquidated damages will be charged for each calendar day that the items of work required for substantial completion remain unfinished. Liquidated Damages shall be $10,000 per day for each day that the work specified in these special provisions for substantial completion of Contract Phase A is not completed.

Contract Phase B

If the Contractor fails to complete all work associated with the substantial completion of Contract Phase B of the Project by November 11, 2011, considering approved extensions of time for this contract phase, liquidated damages will be charged for each calendar day that the items of work required for substantial completion remain unfinished. Liquidated Damages shall be $2,500 per day for each day that the work specified in these special provisions for substantial completion of Contract Phase B is not completed.

Liquidated Damages associated with final completion of the work for contract shall be $1,000 per calendar day and shall apply to each day past the final completion date that any phase of the work remains unfinished.

Determination of the Substantial Completion and Final Completion dates for each contract phase of the project shall be subject to the Engineer's approval. The amount of liquidated damages assessed for failure to achieve the required substantial or final completion dates for the various contract phases of the project will be deducted from the money due the Contractor prior to final payment or in the case where the remaining amount due the Contractor is less than the total amount of the assessed disincentives, the JPA shall have the right to recover the difference from the Contractor or the Contractor's Surety.

STATUS OF RIGHT-OF-WAY

All work to be completed shall be performed in existing public right-of-way, new right-of-way or private properties where a right-of-entry or temporary or permanent construction easements will be obtained. The JPA is currently negotiating with the adjacent property owners to acquire the additional right-of-way and easements to construct the project. The status of the unacquired right-of-way tracts is estimated as follows.

TRACT NO.	CONTRACT APPROVAL DATE	HEARING DATE	IMPROVEMENTS REMAINING THIS DATE	ANTICIPATED ACQUISTION DATE	ESTIMATED RELOCATION DATE
1	ROE Secured		NA	NA	NA
2	Negotiating		NA	5-31-11	NA
BNSF	Agreement Executed		NA	Close 5-6-11	NA

The Contractor will not be allowed to perform work outside the existing public right-of-way on any tract listed above until legal and physical possession has been acquired by the City or a right-of-entry has been acquired by the City that will allow the Contractor to work on the property. If necessary, the Contractor will be granted an extension of time for completion of work on the

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project if it is substantiated by the Contractor that a delay in the completion of the work is caused because of the above tract(s) not being acquired by the anticipated acquisition date.

STATUS OF UTILITIES

The following information is current as of March 21, 2011. The Contractor should request a utility status update at the project pre-construction conference, and/or prior to starting work. The Contractor shall coordinate all construction activities with affected utilities that have identified relocations which are to be completed concurrent with the project.

Utilities known to have facilities in the project area:

Contractor Utility Relocates

The following utilities shall be relocated by the Contractor as part of the Project as shown on the plans.

City of Lincoln

The City of Lincoln has existing water mains and sanitary sewers within the limits of the project. All necessary adjustments, relocations and extension of water mains or sanitary sewers shall be completed by the Contractor as part of the project as shown on the plans. To the extent possible, all new water main work shall be installed prior to connecting into the existing system in order to minimize the down time of the existing system.

The Contractor will be required to install a new 12" water main along "R" Street which will include reconstruction of the water service to the USPS building. This work will also include removal of the existing water meter vault, meter and backflow devices that provide service to the former BNSF yard. All removed meters, backflow devices and other equipment associated with the water meter vault and BNSF buildings to be demolished under this contract shall be salvaged and delivered to the Lincoln Water Systems facilities on North 27th Street.

The Contractor will be required to construct new sanitary sewers within the project area as shown on the plans. This will include reconstruction of an existing sanitary sewer at the northwest corner of the USPS building to allow for abandonment of the existing sewer that crosses the pad site for the new arena. Reconstruction work for this sewer shall be coordinated with the USPS due to impacts to access to their existing parking area. In addition, the Contractor will need to construct new sanitary sewers to relocate the existing sewers to the proposed future street right-of-ways as shown on the plans. This will require the contractor to construct a portion of the new sanitary sewer parallel to the existing BNSF Passenger main and this work will require temporary shoring as stipulated in these Special Provisions.

All work within this area which may impact public water or sewer facilities will require coordination with the City of Lincoln Water System, City of Lincoln Wastewater System, and the Engineer to minimize impact to daily activities.

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The point of contact for the City of Lincoln is:

City of Lincoln Water System
Contact: Steve Owen
Phone: (402) 441-5925

City of Lincoln Wastewater System
Contact: Brian Kramer
Phone: (402) 441-7987

Private Utilities

The following utilities are known to exist within the Project limits, and may need to be relocated as a result of the Project. The Contractor shall take into consideration the associated durations of utility relocations, and these associated durations should be considered in the baseline schedule, and prosecution of the Work. The Contractor shall conduct ongoing coordination meetings with all utility owners to facilitate these relocations.

Black Hills Energy

Black Hills Energy (BHE) will be installing a new gas main along "R" Street from 7th Street to the east. The Contractor shall coordinate their work with BHE to allow this work to be completed concurrently with construction of the project. BHE will require 6 working days to complete the work associated with construction of the new gas main. The working days outlined to complete this work shall begin two weeks following the date BHE receives written notice from the Contractor that the site will be ready for them to begin work. Working days do not include weekends or days when inclement weather renders the conditions at the site unsafe to perform the work. Failure of the Contractor to provide BHE the required advanced notice shall not be grounds for an extension in contract time.

The Contractor shall conduct their work in such a manner so as not to adversely impact or interfere with the construction work for the gas main or abandonment of the existing facilities.

The point of contact for Black Hills Energy is:

Contact: Randy Kreifels
Phone: (402) 437-1715

Lincoln Electric System (LES)

LES will be installing new conduits along the north side of the "R" Street right-of-way between the existing BNSF right of way and 8th Street. This work will be performed concurrently with the project and the Contractor shall coordinate their work activities with LES. LES will require 7 working days to complete the work associated with installation of the new conduits along "R" Street. The working days outlined to complete this work shall begin two weeks following the date LES receives written notice from the Contractor that the site will be ready for them to begin work. Working days do not include weekends or days when inclement weather renders the conditions at the site unsafe to perform the work. Failure of the Contractor to provide LES the required advanced notice shall not be grounds for an extension in contract time.

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The point of contact for LES is:

Contact: Steve Wallingford
Phone: (402) 467-7680

Windstream

Windstream will be installing new conduits along the north side of the "R" Street corridor jointly with LES and concurrently with the project. The Contractor shall coordinate with Windstream in a similar manner to the coordination, notification and allowable working time requirements stipulated for LES above.

The point of contact for Windstream is:

Contact: Ken Adams
Phone: (402) 467-7680

BNSF Railway

The BNSF Railway has existing buried and overhead fiber, electric, signal and other communication lines within the project area that are being relocated as part of the railroad track relocation project. The BNSF relocation work for their communication lines and signal lines will be on-going with this project and the Contractor shall be required to coordinate all work within the existing BNSF right-of-way with the BNSF Railway representatives throughout the course of the work. Failure of the Contractor to coordinate with the BNSF and adjust their work activities as necessary to avoid impacting existing railroad facilities that are being relocated shall not be grounds for an extension in contract time unless otherwise approved by the Engineer.

The Contractor shall not perform any excavation work on existing BNSF property without having contacted the appropriate BNSF staff to locate and flag all underground utilities that may still be in service at the time the work begins. At this time the BNSF has an existing overhead line as shown on the plans that provides service to the existing tower. This line will need to remain in service until the existing tower has been relocated. It is anticipated that this work shall be completed by June 11, 2011. The Contractor shall review the location of this line with respect to the excavation/embankment construction and take this into consideration when preparing their bids and sequencing for completing the work.

The primary point of contact for the BNSF Railway is:

Contact: Gerald Maczuga – BNSF Project Engineer
Phone: (402) 458- 7537 (office)
(206) 265-2427 (cell)

Additional contact for BNSF communication work is:

Contact: Byron Mitchell
Phone: (402) 458- 7600

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UTILITIES

Add the following paragraphs to Article II, Section A (EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS, AND SITE OF WORK):

The CONTRACTOR shall notify the Digger's Hotline of Nebraska (HOTLINE), Phone Number 1-800-331-5666, at least 48 hours in advance of the commencement of work at any site to allow the member utilities to examine the construction site and mark the location of the utilities' respective facilities. The CONTRACTOR shall also notify the BNSF Railway as stipulated in the Contractor Requirements for work on the BNSF property that is included with these Special Provisions.

The CONTRACTOR acknowledges that some (or all) of the utility companies, with facilities shown on the drawings may not be members of the Hotline and, therefore, not automatically contacted by the above-referenced telephone number. The CONTRACTOR shall be responsible for making itself aware of utility company facilities not reported by the Hotline, and shall be liable for any and all damages stemming from repair or delay costs or any other expenses resulting from the unanticipated discovery of underground utilities. The CONTRACTOR shall also be responsible for verifying that each utility has responded to such notification

PERMITS AND LICENSES

Add the following to Article VI, Section M. (PERMITS AND LICENSES):

The OWNER will provide the following permits:

1) NPDES Construction Storm Water Permit
2) NPDES Dewatering Permit
3) Floodplain Permit

The CONTRACTOR shall be responsible for complying with the requirements of all permits acquired by the JPA.

The CONTRACTOR shall acquire all permits required by Laws or Regulations, including, without limitation, the following specific permits (if applicable):

1) Certificates and permits are required for uses such as, but not limited to:
   a) Fuel burning equipment
   b) Gasoline and petroleum distillate storage containers
   c) Land disturbing activities
   d) Odors
2) All associated building demolition permits
3) City, State, and County Transportation Encroachment permits
4) Permit-Required Confined Space
   The workplace in which the WORK is to be performed may contain permit-required confined spaces (permit spaces) as defined 29 CFR 1910.146 and, if so, permit space entry is allowed only through compliance with a confined space entry program meeting the requirements of 29 CFR 1910.146. Contractor shall submit a confined space entry program or submit in writing that compliance with the City's program will be made.

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5) Dewatering Permits or notifications as required by the Lower Platte South Natural Resources District.
6) Fugitive Dust Control Permit

STORMWATER POLLUTION PREVENTION PLAN

The Contractor shall understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the stormwater discharges associated with the industrial activity from the construction site. For reference the general permit is posted on the City's web site, www.lincoln.ne.gov ; keyword: NPDES.

Additionally, the Contractor, as evidenced by their signature on this proposal, agrees and understands that, if awarded the contract on this project, he/she:

1. becomes a co-permittee, along with the owner(s), to the Nebraska Department of Environmental Quality NPDES General Permit for Stormwater Discharge from construction sites on this project; and

2. is legally bound to comply with the Clean Water Act to ensure compliance with the terms and conditions of the stormwater pollution prevention plan as developed under the NPDES permit and the terms of the NPDES permit; and

3. will hold owners harmless for damages and fines arising as a result of noncompliance with the terms of the stormwater permits and authorizations associated with the work on this project; and

4. shall be responsible for the maintenance of the sediment control measures until permanent stabilization and cover crop is established; and

5. shall complete permanent or temporary stabilization within seven (7) calendar days of soil disturbance to the surface of all perimeter controls, topsoil stockpiles, and any other disturbed or graded areas on the project site which are not being used for material storage, or on which actual earth moving activities are not being performed; and

6. shall complete the approved inspection forms and inspect/maintain all sediment or erosion control practices required under this contract at least once every seven (7) calendar days and after any storm event of greater than 0.5 inches of precipitation, on the site, during any 24-hour period; any necessary repairs or cleanup to maintain the effectiveness of the best management practices shall be made by contractor immediately; and

7. shall update the approved SWPPP plan immediately following any changes or additions to the plan, keep all inspection forms with the SWPPP plan, preferably on site in a mailbox, and provide copies of all inspection forms and modifications to the SWPPP plan to the JPA's Construction Project Manager, within 48 hours of inspection.

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SPECIAL PROSECUTION AND PROGRESS - MATERIALS

Add the following paragraph to Article IV (CONTROL OF MATERIALS):

The Contractor will be allowed to order storm sewer pipe, water main, casings and other items that are approved as necessary for early construction by the Engineer upon award of the contract. In the event that the contract is not fully executed by reason beyond the control of the Contractor, and the materials have been delivered or firm delivery commitments have been made, the JPA will purchase this material from the Contractor at paid invoice prices plus 10 percent of the total invoice amount for the Contractor's operating and overhead costs.

SPECIAL PROSECUTION AND PROGRESS – CONSTRUCTION PHASING

The following prosecution and progress of work shall be used in developing the baseline schedule for the project. The Contractor will be required to generally proceed with sequencing the construction work as shown on the phasing plans unless otherwise approved by the Engineer.

All work on BNSF owned property shall be coordinated with the BNSF's designated project representative as shown on the plans. Continuous vehicular and pedestrian access shall be maintained to the US Post Office parking lots at all times during the construction of the project and access to the parking areas at other adjacent properties at all times unless otherwise approved in advance by the Engineer.

The Contractor shall be responsible for providing the traffic control plan, stamped and signed by a registered professional engineer, licensed in Nebraska, and submitting to the owner for approval for each phase of the work. The Contractor shall also be responsible for supplying all temporary construction signs and traffic control devices for the project as outlined in the City of Lincoln Standard Specifications for Municipal Construction.

The Contractor shall not close any portion of the public roads or begin any work which may impact drive access to adjacent properties without the permission of the Engineer. The Contractor shall at all times, to the extent practical, provide facilities of ingress and egress to and from the public street to maintain access to adjacent properties throughout the duration of the project as noted on the plans or as directed by the Engineer.

This may require the Contractor to construct new drives or pavement in phases to allow access from the public street during construction, use high early strength concrete for drive construction, or to provide temporary drives as shown on the plans or as directed by the Engineer. All temporary drives and approaches to provide ingress and egress at adjacent properties shall be provided and maintained by the Contractor. All temporary drives which have active sidewalks (permanent or temporary sidewalks) crossing the drive shall be constructed using temporary hard surfacing and shall be ADA compliant. Crushed rock surfacing shall not be used at temporary drives that have permanent or temporary pedestrian access routed across the drives.

As directed by the Engineer, the Contractor shall furnish and install eight foot high chain link fence as shown on the plans to prevent pedestrians from entering the construction area or entering into the BNSF property. The eight foot high chain link construction fence may be required at other locations as directed by the Engineer. Chain link fence, eight foot in height

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shall be a contract pay item. The chain link fence along the BNSF tracks shall be constructed prior to the start of other construction work on the project. At locations where the temporary fence will be in conflict with sanitary sewer construction proposed to be completed during Phase II, the fence shall be temporarily removed and reinstalled. Removal and reinstallation of the temporary fence shall not be paid for directly and shall be considered subsidiary to the pay item for the fence construction.

All temporary construction fencing that is to be installed adjacent to pedestrian areas and sidewalks shall be ADA compliant. When temporary fencing is used to delineate a pedestrian pathway, a continuous detectable edging should be provided throughout the entire length of the facility such that pedestrians using a cane can follow it. These detectable edgings should adhere to the provisions outlined in the current MUTCD for "Detectable Edging for Pedestrians".

Sidewalk closures and detours shall be clearly posted and maintained throughout the course of the project to direct pedestrians around the construction site. The Contractor will be required to maintain pedestrian access to the adjacent properties as directed by the Engineer throughout the duration of the project. All temporary pedestrian pathways shall be a continuous hard surface throughout the entire length of the temporary facility and shall be ADA compliant. Temporary sidewalks shall be 4" concrete or 4" asphalt and shall be paid in accordance with the appropriate pay item shown in the proposal. Removal of temporary sidewalk shall be paid for as Pavement and Sidewalk Removal. Temporary sidewalks shall be constructed as directed by the Engineer to facilitate pedestrian access.

Phase I shall generally include all work associated with construction of the site work between approximate Station 2107+50 to Station 2121+00 (the area from the south right-of-way line on "R" Street to the north where the new arena will be constructed). Phase I is broken down into three sub-phases, Phase IA, Phase IB and Phase IC. Phase IA includes work that can be begin immediately upon receipt of a notice to proceed for the project. Phase IB includes work includes the work associated with hauling in offsite borrow for the construction of the fills, embankment and surcharges at the arena site. This phase cannot begin until approval of the Remedial Action Plan (RAP) for the arena site has been received from the Nebraska Department of Environmental Quality (NDEQ). Phase IC is the work on "R" Street to the east of the existing wall at the USPS parking lot. This work cannot begin until a right-of-entry or temporary easement is received from the USPS to allow the wall to be removed.

Phase IA would include the construction of the new storm sewers along "R" Street from the west end up to manhole B2 (the manhole will be constructed as part of Phase IC and a temporary connection will be made to the 36" storm sewer); construction of the new 54" storm sewer along the east side of the BNSF Passenger Mains northwest of the USPS building; construction of the new sanitary sewer at the northwest corner of the USPS property; construction of the south crushed rock access to the site from 6th and "N" Street; construction of the north access road to the site from 8th Street and Arena Drive; building demolition and other site demolition/removal work; abandonment of existing wells; initial removal of unsuitable material and over-excavation/re-compaction of subgrade soils to remain in place at the area north of "R" Street; and the installation of the casing pipe under the BNSF railroad tracks for the new water main.

All work that impacts the access to the USPS Employee parking lot along the west side of the Post Office shall be closely coordinated with the local Post Master. The Contractor will be required to maintain access at all times to the USPS employee parking lot. This lot is currently accessed by employees from the north end of the lot. When work on the sanitary sewer and storm sewer northwest of the USPS building requires the closure of this access point, the USPS

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employees will be allowed to access the lot from the south end. The Contractor will be required to schedule their work such that access to this lot is not eliminated from both the north and south ends at the same time.

During Phase IA the Contractor shall install chain link fence along the BNSF property to maintain a continuous fence to prevent unauthorized access into the railroad right-of-way by construction workers and to provide a secured site. Installation of the fence shall be coordinated with the work on the 10th and Salt Creek Project which will be installing chain link fence and a rolling gate at the west side of the 8th Street and Arena Drive intersection.

During Phase IA the Contractor may begin removal and disposal of unsuitable material that has been identified at the site. The West Haymarket Environmental Team will have a representative on site to review the excavation removal/disposal work to verify that the material being removed generally meets the previously defined characteristics for soils that would be identified as non-contaminated soils and that would not require special waste disposal or handling. If the environmental team representative determines that the material differs from the samples previously tested at the site, then the Contractor will be directed to temporarily stockpile the excavated material on site for further testing and direction on disposal by the West Haymarket Environmental Team.

Unsuitable materials encountered during the prosecution of the utility installation shall be reviewed by the West Haymarket Environmental Team and may need to be temporarily stockpiled on site to allow testing of the material by the West Haymarket Environmental Team to determine the appropriate method of disposal. Refer to the Environmental Contingency Special Provision that is included with these Special Provisions for further details on disposal of soils off site and dewatering requirements.

Phase IB shall generally include the work associated with construction of the new fills and embankment for the area between approximate Station 2107+50 to 2121+00. This work would include construction of new fills and embankments through the Phase I area; construction of surcharge at the arena site; installation of settlement plates; and removal of the surcharge material to the elevations shown in the cross sections. Phase IB work cannot begin until the JPA has received final approval from the NDEQ on the RAP for the arena site unless otherwise approved by the Engineer and the West Haymarket Environmental Team. It is anticipated that the NDEQ will provide approval of an interim or final RAP for the site on or before May 23, 2011.

Phase IC shall generally include the work along “R” Street from the BNSF Passenger mains, east through the 7th Street intersection. This would include construction of the “R” Street water mains and the pavement reconstruction work on “R” Street. This work shall be completed in conjunction with the work associated with Phase I of the USPS Parking Lot Reconstruction Project and shall be closely coordinated with the local Post Master to ensure access to the Post Office and drop box at all times. Work on this phase cannot begin until a right-of-entry or a temporary easement has been obtained for work at the USPS property. It is anticipated that a right-of-entry or a temporary easement will not be obtained at the USPS property until May 31, 2011. The Contractor shall take this into account when scheduling their work on this phase.

During the work on Phase I (including sub-phases IA and IB), initial access to the site will be from the south at 6th and “N” Street. The Contractor will be required to construct and maintain a temporary crushed rock access road as shown on the plans across the site from 6th and “N” Street to “R” Street. This access will be supplemented by the north access route that will be

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constructed during Phase IA. This will connect to the new paving at 8th and Arena Drive that is proposed to be constructed under the 10th and Salt Creek Roadway Project. The work on 8th Street is to be completed by May 27, 2011 at which time this would provide a second access point to the site. All loaded trucks hauling material off site for disposal or hauling material into the site shall utilize the 6th and "N" Street access point and the Contractor will not be allowed to utilize the new 8th Street connection for loaded trucks unless otherwise approved in advance by the Engineer.

There is an existing overhead line that crosses the BNSF property that will need to remain in place until the existing communication tower at the railroad property is relocated. It is anticipated that this line will need to remain until June 11, 2011. The Contractor will need to coordinate their activities on this phase as well as on future phases to conduct their operations so as not to impact this line while it remains in service.

Phase II shall generally include all remaining work at the site for the area between "O" Street and "R" Street. This would include the construction of the water mains and sanitary sewer to the south of "R" Street; over-excavation and construction of the new fills and embankments in the area south of "R" Street; construction of surcharge at the District Energy Corp site; installation of settlement plates; removal of the surcharge material to the elevations shown in the cross sections; and final stabilization of the site.

The Contractor shall begin the necessary excavation disposal, over-excavation, and embankment construction at the proposed District Energy Corp (DEC) site as the initial items of work during Phase II to allow the embankment and surcharge as quickly as possible. The surcharge at the DEC site shall be immediately removed once settlement has occurred as directed by the Engineer and the final pad site graded to conform to the finished grades on the plans. This work shall be completed by October 28, 2011 so that the DEC contractor may begin work at the site on October 31, 2011. The Contractor shall coordinate all remaining work for Phase II construction with the DEC Contractor so that they can access the DEC pad site to begin construction of the pilings and foundations for the facility.

The Contractor will be allowed to begin construction on Phase II work items prior to completion of Phase I work. It is the Contractor's responsibility to maintain suitable access across the site and to manage the site for the various construction activities.

The Contractor shall also maintain all construction entrances to ensure that dirt track off from the site onto the public roads is minimized. In addition the Contractor shall be required to review the adjacent public streets on a daily basis to verify that there is not any dirt being tracked off from the site onto these roadways. Any dirt track off from the site shall be immediately cleaned up by the Contractor as directed by the Engineer.

The Contractor shall notify all adjacent property owners a minimum of 7-days in advance of any roadway closures or changes in access to their properties during the work on all phases of this project. The Contractor shall provide temporary hard surfacing as directed by the Engineer to provide access to adjacent properties along the roadways during the construction of the project. To the extent practical, the Contractor shall make every effort to minimize the time access is restricted to the adjacent properties.

The Contractor may submit a revised construction phasing plan to the Engineer for review and approval. The revised construction phasing plan shall identify all streets that will remain open to

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accommodate local and through traffic within the project area during each construction phase of the project. The revised phasing plan shall take into consideration all traffic requirements and impacts to existing traffic as stipulated in the original phasing plan. The Contractor shall not alter the proposed sequencing shown on the phasing plans without approval of the Engineer and the JPA.

At completion of construction work at the adjacent property, the Contractor shall promptly remove and dispose of all debris and waste material from the site. The Contractor shall not use the temporary construction easement areas for general storage of materials, equipment, or employee parking unless otherwise approved by the Engineer and the adjacent property owner. The Contractor shall limit the time the temporary construction easement areas are disturbed to the time required to complete the work as detailed on the plans. If the Contractor will require additional space outside the street right-of-way for storage of equipment and material during the duration of the project, then the Contractor, at his expense, shall be responsible to secure temporary property rights from the adjacent property owners.

WORKER VISIBILITY

Pursuant to Part 634, Title 23, Code of Federal Regulations, the following modified rule is being implemented:

Effective on January 1, 2008, all workers within the right-of-way who are exposed either to traffic (vehicles using the highway for purposes of travel) or to construction equipment within the work area shall wear high-visibility safety apparel.

High-visibility safety apparel is defined to mean personal protective safety clothing that:

1 - is intended to provide conspicuity during both daytime and nighttime usage, and

2 - meets the Performance Class 2 or Class 3 requirements of the ANSI/ISEA 107-2004 publication entitled "American National Standards for High-Visibility Safety Apparel and Headwear."

If the Contractor fails to comply with the worker visibility requirements and as a result, Federal and State authorities withhold Federal Funds, then JPA reserves the right to seek reimbursement from the Contractor for the loss of federal funds that are attributed to the Contractor's non-compliance.

COORDINATION WITH OTHERS

The Contractor will be required to coordinate their work on the north access road for this project with the JPA's Contractor for the 10th and Salt Creek Roadway Project. The Contractor for the 10th and Salt Creek Roadway Project will be constructing the new roadway along 8th Street between "T" Street and Arena Drive and will be installing the new fence and rolling gate at the west leg of the 8th Street and Arena Drive intersection.

The Contractor will be required to coordinate their work on this project with the JPA's Contractor who will be removing the existing Canopy through the limits of "R" Street right-of-way. Once the canopy has been removed the Contractor will be required to immediately remove

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the existing platform so that the BNSF may have access to the tracks to construct the temporary crossing to the site at "R" Street.

The Contractor will be required to coordinate their work on this project with the JPA's Contractor for the "M" and "N" Street, 7th to 10th Street Construction Project. This coordination will generally be in regard to access to the construction site from 6th and "N" Street during the project. The "N" Street access shall be the primary access for loaded trucks to enter or exit the site up until such time that the "R" Street access and new pavement on "R" Street east of the tracks is in-place and ready for use.

The Contractor will be required to coordinate their work on this project with the Contractor selected for construction of the District Energy Corporation plant site. The plant site is located along the west side of the project site between "P Street and "Q" Street and as stipulated in the Phasing Special Provision, construction of the DEC plant may begin October 31, 2011. Therefore the Contractor shall coordinate their remaining Phase II construction work with the DEC Contractor to allow them access to the site so that they can begin construction.

The Contractor shall coordinate all work along "R" Street east of the BNSF tracks with the local USPS representatives. This will include all pavement, storm sewer and water main work along this corridor. Access to the USPS facilities shall be maintained at all times during the prosecution of the work.

The USPS Local Postmaster is:

Kerry Kowalski
USPS
Office: (402) 473-1600

The Contractor shall coordinate their work on this project with the BNSF Railway who will be completing relocation work associated with the railroad tracks as well as communication and signal systems adjacent to project area as part of the track relocation project that is being completed to accommodate construction of the new arena. The BNSF will be constructing the temporary grade crossings at "R" Street and "T" Street for access to the construction site. The BNSF also has existing utilities within the project area that may not be abandoned at the time this project starts. The Contractor shall exercise extreme care so as not to damage any of these facilities during construction of this project until the utilities have been abandoned by the BNSF.

The BNSF Railway Project Engineer is:

Gerald Maczuga – BNSF Project Engineer
BNSF Railway
Office: (402) 458-7537
Cell: (206) 265-2427

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The Contractor shall coordinate the work associated with removal of the surcharge at the arena site with the Construction Manager at Risk for the project. The Contractor shall remove a portion of the surcharge at the north end of the arena site as soon as approval has been granted by the Engineer to allow the Construction Manager at Risk to mobilize to the site and perform the necessary preliminary pile installations and pile tests.

The point of contact for the Construction Manager at Risk is:

John Hinshaw
Mortensen Construction
Cell: (502) 377-4194

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TECHNICAL PROVISIONS

The following Special Provisions amend or supplement the 2006 City of Lincoln Standard Specifications for Municipal Construction and the State of Nebraska Standard Specifications for Highway Construction, 2007 Edition. All provisions which are not so amended or supplemented remain in full force and effect.

CONSTRUCTION STAKING

The Contractor shall use the horizontal and vertical control points as shown on the plans for use in establishing the exact location and elevations for the project. The Contractor shall be responsible for preserving (or reestablishing) these control points if necessary. The Contractor shall use this control to provide all construction staking that is required for the project. This shall include staking for utility construction and all other survey work to complete the project in accordance with the details shown on the plans.

The Contractor shall be responsible for the placement and preservation of adequate ties and references necessary to complete his work. Any additional stakes, templates and other materials necessary for marking and maintaining all reference points and lines shall be the responsibility of the Contractor. The Contractor shall be solely and completely responsible for the accuracy of the line and grade for all features of the work. All work shall be completed to the lines, grades, and elevations indicated on the drawings. The Contractor shall remove and reconstruct work that is improperly located at his expense.

The Contractor shall be required to coordinate with the private and public utilities and shall stake all needed references points or lines needed for the private utilities to adequately construct or relocate their utilities to avoid conflicts with the proposed construction. This shall include all needed finished elevations, tie-in points, line and grades for proposed utilities to be installed by the Contractor or any other points approved by the Engineer. Construction staking for utilities that are not to be relocated as part of this contract shall be approved by the Engineer prior to performing the work.

The Contractor's staking records shall be recorded in a bound notebook, in a format approved by the Engineer. Record notebooks will be submitted to the City of Lincoln at the completion of the project.

Basis of Payment

Construction staking shall not be measured, but shall be paid for at the Contract Lump Sum amount bid for the pay item "Construction Staking". The amount of the lump sum to be included in each partial payment shall be in proportion to the value of the work completed with respect to the total amount of the original bid.

Construction staking to facilitate relocation of public or private utilities not included as part of the project shall be measured by the survey crew hour required to stake the work. The time shall be based upon the amount of time the survey crew is on site to complete the work including an allowance for reasonable travel time to the site (travel time allowance to the site shall not exceed one half hour per trip). The final measured time for the work shall be as measured by the construction site manager and shall be subject to the approval of the Engineer. Payment for the utility staking shall be paid for in accordance with the amount bid per hour for the item

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"Construction Staking for Utilities". Said payment shall include all costs associated with office preparation, reasonable travel time to the site and completion of the staking work by a survey field crew including all labor, equipment, materials and incidentals.

DIVERSION AND CARE OF WATER

Methods and details for care and diversion of water are not detailed on the plans. Full responsibility for the diversion and care of water from whatever source, including, but not limited to, direct rainfall, groundwater, surface runoff and sources outside of the construction area shall be borne by the Contractor until completion of work under this contract. The Contractor shall provide all materials, labor, and equipment, and perform all work necessary to facilitate construction and to protect the work in progress from damage by water. The Contractor shall make his own investigation and determination of existing and anticipated conditions concerning care of water. Plans for diversion and care of water during construction shall be submitted to the Engineer, for information only, within 10 calendar days after receipt of Notice to Proceed, and shall show location, material, and method for dewatering the work area and disposal of the water. Discharge of water shall comply with all provisions outlined in the NPDES Permits that have been issued for the project. Direct payment will not be made for diversion and care of water. Work associated with diversion and care of water shall be considered incidental to the work.

DEWATERING

All dewatering activities associated with construction of the roadway or utilities on this project shall be completed in such a manner to meet the discharge limitations as set forth in the NPDES General Permit for Excavation Dewatering and Hydrostatic Testing Discharges, NPDES Number NEG671000 (Area bounded by 2nd Street, Salt Creek Roadway, 8th Street and J Street, Lincoln, NE) as modified by the Nebraska Department of Environmental Quality per letter to City of Lincoln dated February 18, 2011, attached and incorporated as if fully set forth herein or the discharge limitations of the Lincoln Wastewater Department for discharge into the sanitary sewer. The JPA shall secure the dewatering permit and the Contractor will be required to be a co-permittee on the NDEQ dewatering permit for this project.

The Contractor shall provide and maintain pumps, wells, piping and all other equipment and materials needed to conduct dewatering for the construction activity. Furthermore, the contractor shall provide for complete containerization of all water collected from the dewatering operations. The Contractor shall coordinate with the West Haymarket Environmental Team prior to startup of dewatering activities and present their schedule and their dewatering methods. The West Haymarket Environmental Team will be responsible for the collection of representative samples of the water and the laboratory analysis of the dewatering effluent. Based on the laboratory results the West Haymarket Environmental Team will advise the Contractor on the acceptable disposal methods for the effluent from the dewatering operations. No effluent from the dewatering operations shall be discharged from the construction site until the laboratory testing has been completed and the method of disposal has been determined by the West Haymarket Environmental Team. The Contractor shall allow five (5) work days to receive discharge instructions for each container tested.

The Contractor will be required to furnish Dewatering Containers on-site for temporary storage of the dewatering effluent until testing has been completed and the method of disposal

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determined. The on-site containers shall be a Baker Frac Tank as manufactured by Baker Corporation (1-800-225-3712, www.bakercorp.com) or an Engineer approved equal tank that will provide the required storage and settling characteristics for the stored water similar to the specified Baker Frac Tank. Each tank shall have an approximate storage volume of 20,000 gallons per tank (minimum volume of 18,900 gallons). The tanks shall also have fixed axles or other means that will allow the tanks to be moved to different locations on the site as necessary to support the various dewatering operations for the project.

The work associated with the dewatering for this project will be measured and paid for directly as shown below based upon the proposed construction activities:

Construction Activity	Measurement and Payment
Dewatering for Over-excavation Work	Calendar Day
Dewatering for Sanitary Sewers	LF of Trench
Dewatering for Storm Sewers	LF of Trench
Dewatering for Water Mains	LF of Trench
Furnish Dewatering Container	Each
Dewatering Container Usage	Calendar Day

Dewatering that may be required for the over-excavation work and re-compaction of existing site soils as shown on the plans or stipulated in these Special Provisions shall be measured for payment based upon each calendar day the dewatering is required and the Contractor is actively engaged in the over-excavation/re-compaction work that requires the dewatering. Payment shall be made per calendar day of dewatering in accordance with the contract bid item "Dewatering for Over-excavation Work". Said payment shall be full compensation for furnishing all labor, equipment, tools, materials and incidentals to install, operate and maintain the dewatering operations as necessary to complete the work in accordance with the plans and specifications.

Dewatering that may be required for the excavation of trenches for utility construction as shown on the plans or stipulated in these Special Provisions shall be measured for payment based upon the linear foot of trench where dewatering is required. Payment shall be made per linear foot of trench dewatering in accordance with the contract bid items "Dewatering for Sanitary Sewers", "Dewatering for Storm Sewers" or "Dewatering for Water Mains". Said payment shall be full compensation for furnishing all labor, equipment, tools, materials and incidentals to install, operate and maintain the dewatering operations as necessary to complete the work in accordance with the plans and specifications. Dewatering for boring of utilities, if necessary, will be measured and paid for in accordance with the appropriate bid item for the utility trench dewatering and the measurement/payment shall be based upon the linear feet of the boring.

Measurement and payment for containerizing the effluent from dewatering operations until it is tested and for disposal of the effluent into an adjacent City of Lincoln storm sewer or sanitary sewer will be based on furnishing Dewatering Containers on a per each basis with additional compensation made per calendar day that each Dewatering Container is on-site and available for temporary storage of dewatering effluent. If it is determined that the dewatering effluent cannot be discharged directly to the City of Lincoln storm sewer and that it will need to be discharged to the sanitary sewer, then the fees required by Lincoln Wastewater Department for discharge into the sanitary sewer shall be paid directly by the JPA. The Contractor shall be paid for the work associated with containerizing the dewater effluent and subsequent disposal to the storm sewer or sanitary sewer in accordance with the contract price bid per each for the pay item "Furnish

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Dewatering Container" and per calendar day that each Dewatering Container is on-site and is available to support the dewatering activities in accordance with the contract unit price bid for the item "Dewatering Container Usage". Such payments shall be full compensation for furnishing the number of containers shown in the proposal for the duration of the dewatering activities including all labor, tools, equipment, materials and incidentals required to containerize and temporarily store the effluent until tested and to discharge the water into an adjacent storm sewer or sanitary sewer as directed by the West Haymarket Environmental Team.

The Contractor shall base their bid on disposal of the dewatering effluent into the City of Lincoln existing storm sewer system or sanitary sewer system. If the West Haymarket Environmental Team determines that the effluent cannot be discharged to the existing City of Lincoln storm sewer system or sanitary sewer system, then additional compensation for disposal of the effluent based upon the required method for disposal as determined by the West Haymarket Environmental Team will be considered on an "Extra Work" basis. Additional payment for filtering or other devices required to maintain the discharged effluent below the maximum total suspended solids limits shown in the NDEQ General Permit NEG670000 shall not be made.

ENVIRONMENTAL CONTINGENCY PLAN

During the execution of the work on this project it is anticipated that the Contractor may encounter contaminated soils, debris or groundwater (media). If contaminated media is encountered and it is determined by the West Haymarket Environmental Team that it cannot be used on-site (e.g. as backfill for the utility trenches), the Contractor shall be required to dispose of any contaminated media in accordance with all federal, state and local laws.

The Contractor shall also strictly adhere to the requirements and procedures set forth in the Environmental Contingency Plan. The Environmental Contingency Plan is attached and incorporated as if fully set forth herein.

In the event the Contractor or on-site construction management personnel suspect that contaminated media is encountered or will be during the performance of the work, they shall immediately notify the West Haymarket Environmental Team and follow the procedures outlined in the Environmental Contingency Plan for resolution on how to manage the contaminated media. Typical indications of potentially contaminated media include discoloration, odors associated with the media removed as part of boring, trenching or other excavation work. In addition, Figures 3A, 3B and 4A, 4B of the Environmental Contingency Plan illustrates where environmental testing has been taken on-site. The Contractor shall familiarize themselves with these Figures to determine whether the project is located in the area of these environmental impacts.

<u>Management of Soil or Debris to be Removed from the Work Site</u>
During the course of the project the Contractor shall not haul any excavated material off-site without the prior approval of the West Haymarket Environmental Team. As such, the Contractor shall provide locations on-site to temporarily stockpile all excavated material. All temporary stockpiles shall comply with the requirements set forth in the Construction Storm Water Pollution Prevention Plan (SWPPP). The West Haymarket Environmental Team will determine the appropriate method for disposal of the excavated material and make a recommendation to the Contractor.

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The Contractor shall base their bid on the basis that any excavated material to be disposed off-site can be disposed of at a location selected by the Contractor in accordance with all federal, state and local regulations with no other special handling or restrictions. If the excavated material requires special handling due to contamination (petroleum or other chemicals) and the contamination is not the result of the Contractor's activities, then additional compensation for disposal of the contaminated material will be considered on an "Extra Work" basis.

GENERAL CLEARING AND GRUBBING

General clearing and grubbing on this project shall include removal and grubbing of all site trees and stumps regardless of size. Direct payment will not be made for removal of trees and stumps twelve inches in diameter and larger and all costs associated with completing this work shall be included in the contract amount bid for General Clearing and Grubbing. As part of the BNSF Grading Project, the existing site trees within the railroad yard were cut down and piled on the site for removal and disposal by the Contractor for this project.

In addition, this pay item shall also include the general clearing of all other site items within the project grading limits and that are not specifically shown on the plans or called out in the proposal for direct payment. These items may include abandoned wood poles, signs, sign poles, abandoned cables, abandoned lights, fences, miscellaneous foundations, guard rails, railings and other miscellaneous small structures. Direct payment shall be made for removal of the existing BNSF buildings as called for in these Special Provisions.

General clearing and grubbing of the site in accordance with the requirements outlined in the Standard Specification for Municipal Construction as amended by these Special Provisions shall be measured and paid for as one lump sum. Such payment shall be full compensation for furnishing all labor, equipment, tools and materials to complete the work including clearing and grubbing of all site trees and stumps within the limits of the work regardless of tree or stump size.

EARTHWORK CONSTRUCTION

Detailed geotechnical investigations and reports have been prepared for the West Haymarket project. Copies of these reports are available and attached to these Special Provisions for the Contractor's use in bidding and construction of the improvements. The Contractor is fully responsible for reviewing the reports and the report recommendations and shall take this information into consideration when preparing their bid for the project.

Earthwork on the project shall be measured and paid for as generally outlined in the Standard Specification for Municipal Construction and as modified by these Special Provisions. Pay items for earthwork on this project shall include: Excavation Disposal, Over-excavation, Earthwork Measured in Embankment, Stockpiled Soils Reused in Embankment, Surcharge Embankment, Surcharge Removal and Reuse in Phase II Embankment and Disposal of Stockpiled Soils. In addition the Geotechnical Reports identified the potential need for subgrade stabilization at lower areas to facilitate the work associated with the over-excavation. Work associated with stabilizing the subgrade shall be paid for directly in accordance with the appropriate pay items for the Geotechnical Fabric and Granular Material.

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The JPA reserves the right to adjust the actual quantities for the various bid items outlined for the earthwork construction based upon the field conditions or other factors encountered at the time the work is completed. The unit prices for the various earthwork construction items shall not be adjusted due to changes in the quantities unless otherwise approved by the Engineer.

Excavation Disposal

Excavation Disposal shall include the removal of the existing upper portion of unsuitable materials as shown on the plans and disposal or beneficial reuse of the material off-site at a Contractor selected landfill or beneficial reuse site that is approved to accept the removed materials and that meets all local, state and federal laws and requirements. This work shall be completed in accordance with the recommendations and requirements outlined in the Geotechnical Reports.

The West Haymarket Environmental Team will have a representative on-site to review the excavation removal/disposal work to verify that the material being removed generally meets the previously defined characteristics for soils which have been tested for contamination. The pretesting has determined that the level of arsenic, lead and potentially other constituents largely will exceed levels allowed by the Nebraska Department of Environmental Quality (NDEQ) to be beneficially reused as fill in residential areas. However the levels of arsenic, lead and potentially other constituents identified as part of the pretesting would likely allow the material to be beneficially reused as fill at an industrial site.

The JPA is working with the City of Lincoln's Solid Waste Division and the Lincoln/Lancaster County Health Department (LLCHD) to gain acceptance of the material for beneficial reuse at the City's North 48th Street Solid Waste Management site as an approved location for beneficial reuse of the unsuitable material that is removed as part of this project and which is not determined to be "Special Waste" by the NDEQ and LLCHD. As such, the Contractor will be required to haul the unsuitable material to the North 48th Street site and any fees or taxes that may apply to the reuse of the material at the North 48th Street site will be billed directly to the JPA. The Contractor's bid for the excavation/disposal work shall be based upon the loading, hauling and other incidental costs and shall not include disposal fees or taxes if the North 48th Street site is used for reuse of the unsuitable material.

The Contractor may request to dispose of or beneficially reuse the material at an alternate site that would be an acceptable location for the fill material based upon the identified levels of arsenic and other constituents in the excavated soils and the current and future use of the property. The use of an alternate disposal or reuse site is subject to the approval of the West Haymarket Environmental Team and the NDEQ. As part of this approval process the Contractor may be required to provide certification to the JPA/NDEQ or place restrictions on the current and future use of the property to ensure that the site where the material is placed will not be used for residential purposes or other uses where the arsenic or other constituent levels in the unsuitable material would be unacceptable.

If the environmental team representative determines that the unsuitable material being removed differs from the samples previously tested at the site, than the Contractor will be directed to temporarily stockpile the excavated material on site for further testing and direction on disposal by the West Haymarket Environmental Team. The work associated with temporarily stockpiling and reloading the material for disposal shall be considered an "Extra Work" item and additional

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compensation will be considered, subject to the approval of the Engineer. In addition if the material is determined to be "Special Waste" and it may not be disposed of at the North 48th Street site than the work associated with the disposal of the special waste shall be considered an "Extra Cost". No stockpiled soil shall be removed from the site without prior approval of the West Haymarket Environmental Team.

Payment for disposal of unsuitable excavated materials shall be made at the contract unit price bid per cubic yard for the pay item "Excavation Disposal". This payment shall be full compensation for excavation, loading, hauling and unloading of the material at the North 48th Street site or other approved site in accordance with all local, state and federal laws and regulations.

Over-excavation

The over-excavation item shall include the removal, reworking and re-compaction of existing subgrade soils to the required densities and moisture content as stipulated in the Geotechnical Reports. This work shall include drying of the existing subgrade material or possibly application of water to obtain the required moisture content that is required to achieve proper compaction as outlined in the Geotechnical Reports.

The over-excavation of existing fill materials in some areas will extend to within 1.0 feet of the water table or below. The bottoms of these excavations may require dewatering and dewatering for over-excavation work will be paid for directly as outlined in the Dewatering Special Provision. In addition the bottom of the over-excavation areas might also become disturbed by repeated passes of construction equipment during the excavating operations if groundwater conditions are high. To prevent excessive disturbance, the final one to two feet of materials in the excavation may need to be removed with track-type equipment instead of rubber-tired equipment.

The quantity of over-excavated material is an established quantity based upon the site cross sections shown in the plans. Additional areas that may require over-excavation, as determined by the Engineer, shall be surveyed and measured in the field. Payment for over-excavation shall be made at the contract unit price bid per cubic yard for the pay item "Over-excavation". This payment shall be full compensation for excavation, reworking the material as necessary to obtain proper moisture content, providing water or drying of the soils as necessary for compaction, and compaction of the over-excavated material as directed by the Engineer to provide a uniform compacted subgrade section below the future building pad sites and roadways as shown on the plans.

Earthwork Measured as Embankment

Earthwork Measured as Embankment quantity shall include the construction of the fills and embankment on the project with Contractor furnished off-site borrow. This shall include borrow material, loading, hauling, placement and compaction of the fill material to construct the embankments to the lines and grades shown on the plans. Construction of the fills and embankments shall be completed in accordance with the requirements outlined in the Geotechnical Reports. This pay item shall also include all grading work associated with construction of the swales and rough grading for the sediment basins as shown on the plans. The Contractor shall furnish samples of the borrow material to be used for the fill material on this project to the Engineer for approval prior to start of the work.

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Measurement for Earthwork Measured in Embankment is an established quantity based upon the lines and grades shown on the cross sections and the grading plan for the project. The quantities for Earthwork Measured in Embankment has been established based upon the cross sections with no balance factor applied (final compacted in-place volume).

Payment for Earthwork Measured in Embankment shall be made at the contract unit price bid per cubic yard for the pay item "Earthwork Measured in Embankment". Such payment shall be full compensation for furnishing, loading, hauling and placement of off-site cohesive borrow to the lines and grades shown on the plans including all necessary working of the material to obtain proper moisture content, providing water or drying of the soils as necessary for compaction, and compaction of the fill material as directed by the Engineer to provide a uniform compacted embankment in accordance with the recommendations outlined in the Geotechnical Reports. All cohesive borrow material to be used in the construction of the fills and embankments shall meet the requirements outlined in the Geotechnical Reports. The Contractor shall furnish samples of the soil to be used for the cohesive borrow material to the Engineer for approval prior to start of the work.

Stockpiled Soils Reused in Embankment

Stockpiled soils have been removed as part of the BNSF railroad track grading project and the locations of the stockpiles are as shown on the plans. The existing stockpiled soils have generally been determined to be suitable for reuse as fill material at the West Haymarket site for fill areas and embankment construction up to 3.0 feet below the finished top of embankment elevations shown on the plans (a minimum of three feet of compacted cohesive material shall be placed above all fills and embankments constructed using the existing stockpiled soils). Based upon geotechnical testing of the existing stockpiled soils, the moisture content of the soils is generally above the maximum moisture content allowed and reworking of the material will be required to dry the soils to the proper moisture content needed for compaction. It is anticipated that some of the existing stockpiled soil may not be suitable for reuse and may need to be disposed of or beneficially reused at a location off site as determined by the Engineer. Existing stockpiled soils to be disposed of off-site shall be paid for directly as outlined later in this Special Provision. Refer to the Geotechnical Report for further information on the existing stockpiled soils.

In addition to reworking the stockpiled material to attain the proper moisture content, the Contractor shall also be responsible for removal of any rubble or other unsuitable materials prior to placement and compaction of the soils as stipulated in the Geotechnical Reports.

For the purpose of determining quantities for the reuse of the stockpiled soils in the new embankment it is estimated that 80% of the existing stockpiled material will be reused in the construction of the embankment and 20% will be disposed of off-site. To determine the in-place volume of fills and embankment constructed with the reused stockpiled soils, a compaction factor of 1.35 was applied to the volume of the stockpiled soils.

Stockpiled soils reused in the construction of the fills and embankments on the project shall be measured based upon the volume of soil removed from the existing stockpiled and placed in the new embankments. This will be determined by survey cross sectioning of the stockpiles prior to the start of construction and upon completion of the work. Stockpiled material that cannot be reused will be separated and cross sectioned separately to determine the volume.

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Payment for stockpiled soils reused in the construction of the fills and embankments shall be made at the contract unit price bid per cubic yard for the pay item "Stockpiled Soils Reused in Embankments". Such payment shall be full compensation for loading, hauling, reworking, drying, removal of unsuitable materials, placement and compaction of the stockpiled materials to construct the new fills and embankments to the lines and grades shown on the plans as directed by the Engineer to provide a uniform compacted embankment in accordance with the recommendations outlined in the Geotechnical Reports.

Surcharge Embankment

The Contractor shall provide suitable cohesive borrow material to construct the surcharge embankments to the lines and grades shown on the plans to expedite consolidation of the underlying soils and fill material. Surcharge embankments shall be constructed at the arena site and at the District Energy Corp. site as shown on the plans. The Contractor shall plan on using the removed surcharge material in the construction of the fills and embankments at the areas to the south of "R" Street during Phase II construction of the project. The Contractor shall furnish samples of the soil to be used for the surcharge to the Engineer for approval prior to start of the work. Surcharge material shall not be removed without prior written approval from the Engineer.

Measurement for surcharge material shall be based upon the plan cross sections and is an established quantity. Payment for furnishing, placement, and shaping of cohesive material used in the construction of the surcharge embankments shall be made in accordance with the contract unit price bid per cubic yard for the pay item "Surcharge Embankment". Said payment shall be full compensation for furnishing all labor, equipment, and materials required to truck dump and shape the surcharge material to the lines and grades shown on the plans and cross sections. Removal of surcharge material to be used in the construction of the fills and embankment at the area to the south of "R" Street shall be paid for directly.

Surcharge Removal and Reuse in Phase II Embankment

The Contractor shall remove the proposed surcharge materials and use this material in the construction of the fills and embankments at the areas to the south of "R" Street during Phase II construction of the project. This work shall include all necessary work associated with removal of the surcharge material, final shaping of the embankment where the surcharged material is removed to provide the final lines and grades shown on the plans, hauling, and placement of the material to construct the fills and embankments for the Phase II portion of the project including all necessary working of the material to obtain proper moisture content, providing water or drying of the soils as necessary for compaction, and compaction of the material to provide a uniform compacted embankment in accordance with the recommendations outlined in the Geotechnical Reports.

Measurement for surcharge material removed and used in construction of the Phase II fills and embankments shall be based upon the plan cross sections and is an established quantity. Payment for removal, hauling and placement, and compaction of the removed surcharge material at the Phase II fills and embankments shall be made in accordance with the contract unit price bid per cubic yard for the pay item "Surcharge Removal and Reuse in Phase II Embankment". Said payment shall be full compensation for furnishing all labor, equipment, and materials required to remove, haul, place and compact the removed surcharge material at the Phase II fills and embankments to the lines and grades shown on the plans and in accordance with the recommendations of the Geotechnical Reports.

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To determine the in-place volume of fills and embankment constructed with the reused surcharged soils, a compaction factor of 1.30 was applied to the volume of the surcharged material that is to be removed and reused at the Phase II fills and embankments.

Disposal of Stockpiled Soils

Disposal of existing stockpiled soils shall include the removal and disposal or beneficial reuse of the unsuitable stockpiled material at an off-site location. The JPA is working with the City of Lincoln's Solid Waste Division and the Lincoln/Lancaster County Health Department (LLCHD) to gain acceptance of the material for beneficial reuse at the City's North 48th Street Solid Waste Management site as an approved location for beneficial reuse of the unsuitable material that is removed as part of this project and which is not determined to be "Special Waste" by the NDEQ and LLCHD. As such, the Contractor will be required to haul the unsuitable material to the North 48th Street site and any fees or taxes that may apply to the reuse of the material at the North 48th Street site will be billed directly to the JPA. The Contractor's bid for the disposal of existing stockpiled soils shall be based upon the loading, hauling and other incidental costs and shall not include disposal fees or taxes if the North 48th Street site is used for reuse of the unsuitable material.

As discussed for the excavation/disposal work, the Contractor may propose to use an alternate site for disposal or beneficial reuse of the existing stockpiled material subject to the approval of the West Haymarket Environmental Team, the NDEQ and the requirements previously outlined for the excavation/disposal work.

The Contractor shall not haul any excavated material off-site without the prior approval of the West Haymarket Environmental Team. Refer to the Environmental Contingency Plan Special Provision for requirements regarding removal of all excavated material from the site.

Measurement and payment for removal and disposal of the existing stockpiled soils shall be made at the contract unit price bid per cubic yard for the pay item "Disposal of Stockpiled Soils". Such payment shall be full compensation for furnishing all labor, equipment, tools materials and incidentals required to load, haul and unload the material for beneficial reuse at the North 48th Street landfill or other approved site in accordance with all local, state and federal regulations.

Subgrade Stabilization

It is anticipated that a portion of the subgrade area for the over-excavation work will need to be stabilized in order to complete the over-excavation work in accordance with the requirements outlined in the Geotechnical Reports. Several alternatives are provided in the Geotechnical Report for the subgrade stabilization. The Contractor shall base their bid on providing subgrade stabilization in accordance with the requirements outlined in the Geotechnical Report for "Stabilizing with a Geotextile and Granular Materials".

Approved geotextiles as outlined in the Geotechnical Reports for use in subgrade stabilization shall be measured and paid for by the square yard at the contract unit price bid for the pay item "Geotextile for Subgrade Stabilization". Granular Material for subgrade stabilization shall be measured and paid for by the ton at the contract unit price bid for the pay item "Granular Material for Subgrade Stabilization". Such payment for the geotextile and granular material shall be full compensation for the work required to stabilize the subgrade in accordance with the requirements outlined in the Geotechnical Report for "Stabilizing with a Geotextile and Granular Materials.

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NORTH 48TH STREET DISPOSAL SITE

As outlined in the Earthwork Special Provision, the Contractor shall dispose of the unsuitable material from the excavation disposal work along with any unsuitable material from the existing stockpile that cannot be reused in the construction of the new embankments, at the City of Lincoln's North 48th Street site unless a Contractor furnished site is approved by the West Haymarket Environmental Team and the NDEQ. The approximate location and access to the North 48th Street site is shown on the map that is attached to these Special Provisions. The map identifies location for disposal of construction rubble, disposal of the unsuitable soils and the access road into the site to be used and maintained by the Contractor.

The City of Lincoln Solid Waste Management Department has a grading plan for the area where the unsuitable material will be placed and a SWPPP for completion of this work. The Contractor will be required to place, grade and compact the material to conform to the grading plan. The Contractor can elect to complete the grading and shaping of the material to conform to the grading plan at the time the soil is being disposed of at the site or they can create a stockpile and perform the grading work upon completion of the hauling of the unsuitable material. The graded material shall be constructed in such a manner to ensure proper drainage at all times and to conform to the overall grading plan for the North 48th Street site. All stockpiles shall be protected with silt fence and other measures as outlined in the approved SWPPP for the grading at the North 48th Street site. At the completion of the grading, the area should be seeded with as outlined in the SWPPP.

In addition, the Contractor will be responsible for complying with all requirements outlined in the SWPPP for the North 48th Street site grading. This includes furnishing and installing all temporary and permanent sediment and erosion control devices, grading the material to provide proper drainage, dust control during hauling/grading operations, maintenance of the access road including providing rock and geotextile filter fabric as required to build the required construction entrance off of the public roadway, and all other requirements as outlined in the SWPPP for the North 48th Street grading work.

Payment for the work associated with grading the material to conform to the grading plan that has been prepared for the North 48th Street site shall be measured and paid for by the cubic yard of material hauled to the site in accordance with the contract bid item "Grading for North 48th Street Site". Such payment shall be full compensation for furnishing all equipment, labor, tools, materials and incidentals required to grade the soil disposed of at the site to conform to the contours shown on the North 48th Street site grading plan and in conformance with the requirements outlined in the North 48th Street SWPPP.

Payment for the work associated with the requirements outlined in the SWPPP that has been prepared for the North 48th Street site shall be measured and paid for at the lump sum price bid for the pay item "SWPPP Compliance for North 48th Street Site". Such payment shall be full compensation for furnishing all equipment, labor, tools, materials and incidentals required to complete the work at the North 48th Street site in conformance with the requirements outlined in the SWPPP. This would include building the required construction entrances; maintaining and grading the access road including placement of crushed rock as necessary; furnishing, installing, and maintaining the necessary temporary and permanent erosion and sediment control devices; temporary and permanent seeding; dust control and compliance with all other requirements as outlined in the SWPPP for the North 48th Street site.

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Hauling of the material to the North 48th Street site is as outlined in the Earthwork Special Provision and will be paid for directly in accordance with the appropriate contract bid items.

SETTLEMENT PLATE

The Contractor shall furnish settlement plates in accordance with the details shown on the plans at the locations of the surcharge embankments to be constructed as part of this project. To avoid disturbance, the soils placed immediately above each settlement plate should be buried using hand placed and hand compacted fill materials up to a minimum level of 2.0 feet above each plate. The Contractor shall ensure that the plates are set level. The Contractor shall exercise extreme care during construction of the embankment so as not to damage or disturb the settlement plates.

The Contractor shall provide the Engineer initial surveyed elevations and horizontal coordinates at the center of the settlement plates immediately following installation of the plates and prior to fill being placed above the 2.0 foot depth above each plate. The initial survey tolerance shall be 0.01 foot for the plate elevation and 0.1 foot for the horizontal location of the center of the plate. The Geotechnical Engineer will perform the monitoring of the settlement at the plates once the embankment and surcharge are in place.

Furnishing, installation and initial survey of settlement plates shall be paid for in accordance with the contract unit price bid per each for the pay item "Settlement Plate". Said payment shall be full compensation for furnishing all labor, equipment, materials and incidental items required to install and monitor the settlement plates in accordance with the details shown on the plans and the requirements stipulated in this special provision.

SEDIMENT BASINS

The Contractor shall construct sediment basins at the locations shown on the plans and as directed by the Engineer. The sediment basins shall be constructed in conjunction with the construction of the fills and embankment to minimize the potential for discharge of sediment off site. The rough grading for the sediment basins shall be completed and paid for as part of the payment for the appropriate earthwork pay item on the project. Discharge pipes from the basins to the storm sewer or drainage outlets will be paid for directly as shown on the plans.

The work associated with construction of the rip rap, rock/gravel filters, filter fabric, finish grading, anti-vortex device at the riser pipe, concrete pads and all other incidental items required to provide a complete and operational sediment basin shall be considered part of the work for construction of the sediment basins. In addition, the Contractor will be required to maintain the sediment basin throughout the course of the construction of this project.

Measurement and payment for construction of sediment basins shall be made at the lump sum price bid for the pay item "Sediment Basin '__'". Said payment shall be full compensation for furnishing all labor, tools, equipment, materials and incidental items required to construct and maintain the sediment basin during the course of the project.

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REMOVE BUILDING

Where shown on the plans or as directed by the Engineer the Contractor shall remove former BNSF building structures to accommodate the site utility and grading work. The Contractor shall be required to secure all necessary permits required to complete the building demolition and removal as shown on the plans, in accordance with these special provisions, and in accordance with the requirements stipulated in Chapter 20.08.410 of the City of Lincoln Municipal Code. These may include but shall not be limited to the necessary permits from the City of Lincoln Building and Safety Department for demolition of buildings at commercial and residential properties, permits from the City of Lincoln/Lancaster County Health Department for removal and disposal of materials containing asbestos, landfill permits/fees for disposal of material, and all necessary permits required to properly abandon all existing site utilities.

The Contractor shall maintain insurance coverages in accordance with the requirements stipulated in Chapter 20.08.410 of the City of Lincoln Municipal Code during completion of all building demolition work within the City.

The work will require total removal of the buildings indicated on the plans and as directed by the Engineer. This shall include complete demolition of the buildings, foundations, all concrete floors, incidental items and all other appurtenance structures attached to or common with the building. All building demolition and site clearing work shall be in accordance with all local, state and federal, regulations and guidelines, and all OSHA requirements. All materials resulting from the building demolition and site clearing shall be disposed of at an appropriate landfill.

All asbestos containing material shall be removed by a certified Asbestos removal Contractor prior to the start of any building demolition work. The removal and disposal of all material containing asbestos shall be in strict accordance with all local, state and federal regulations and guidelines. All asbestos containing material shall be properly encapsulated and disposed of at an appropriate landfill in accordance with all local, state, and federal regulations and guidelines.

The West Haymarket Team has reviewed the buildings and sampled to determine if asbestos material is present. The review indicated that there are asbestos material present at both buildings and asbestos abatement will be required prior to demolition. Preliminary building information report is attached to these Special Provisions. A copy of the final report for the asbestos material review and sampling at the buildings to be demolished as part of this project will be made available to prospective bidders as an addendum to the bidding documents.

During the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. This shall include all necessary protection of adjacent property and existing structures that are to remain in place. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural elements will be allowed to be left standing, without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work within the immediate area.

All trees and shrubs adjacent to the demolition sites that are not shown on the plans to be removed shall be protected during the course of the work.

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The successful bidder shall be responsible for the abandonment of all public and private utilities that connect to the building to be removed. The bidders shall include all applicable fees and permits required to complete the abandonment of utilities in their bid.

All utilities shall be properly abandoned in accordance with the requirements of the pertinent utility company providing the service to the property. The Contractor shall coordinate the utility abandonment at each property with the appropriate representative of the utility companies to ensure that their facilities are not adversely impacted during the abandonment or demolition process.

Removal of buildings as shown on the plans shall be measured and paid for per each in accordance with the contract item "Remove Building at Sta. __". Said compensation shall be considered full payment for all labor, equipment, materials, permits, landfill fees, and incidental items required to demolish the buildings where shown on the plans and as stipulated in these special provisions and dispose of all debris and material resulting from the building demolition.

TEMPORARY SHORING

The Contractor shall be required to design, construct and maintain temporary shoring as required to complete the construction of the new casing pipes, sanitary sewers, water mains and other structures that are located adjacent to railroad tracks that will remain in service during the construction of the project or at other locations as necessary to protect existing property. Each temporary shoring installation shall be established to accommodate all of the work required to construct the pertinent utility across the limits of the railroad tracks or adjacent to the tracks and in such a manner so as not to restrict the use of the tracks or stability of the railroad embankment. The final limits of the temporary shoring required to complete the work shall be determined by the Contractor.

The temporary shoring bid item shall include the design for the shoring, determination of final shoring limits, construction work associated with installation of the shoring including any tie back anchors required to provide a stable excavation, and removal of the shoring upon completion of the utility work. The temporary shoring installation shall meet the applicable portions of Section 703 in the State of Nebraska Standard Specifications for Highway Construction 2007 Edition.

It shall be the responsibility of the Contractor to contract with a professional engineer registered in the State of Nebraska to design the temporary shoring including all necessary tie back anchors to protect the existing railroad embankment and tracks or other existing property. The design of the shoring adjacent to all railroad tracks shall use a Cooper's E-80 railroad loading and shall take into account all other applicable surcharge loadings and soil conditions that may be encountered during the completion of the work. Prior to the start of excavation adjacent to the tracks, the Contractor shall submit their shoring design calculations to the BNSF for review to ensure that Cooper's E-80 loading requirements are met and that there are no impacts to adjacent "in-service" tracks. No excavation work that may impact existing "in-service" tracks or temporary shoring construction shall proceed without BNSF concurrence on the shoring design.

Design for temporary shoring at locations outside the limits of the tracks that is required to protect existing property or roadways shall be designed to include all appropriate live load surcharges from adjacent parking areas or roadways. Temporary shoring adjacent to existing

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structures shall be designed and constructed to ensure no adverse impacts to the structures during the installation or removal of the shoring as well as during the prosecution of the work.

The item "Temporary Shoring at Station ___" or "Temporary Shoring Station __ to Station __" shall be paid for by Lump Sum. The price shall be considered full compensation for all work prescribed in these Special Provisions including the design, construction, removal, maintenance and furnishing all necessary materials and incidental items associated with the temporary shoring.

ABANDON WELLS

This work shall consist of removing the casing to an elevation at least five (5) feet below the surrounding ground or finished elevations as shown on the plans (or to the elevation shown on the plans to accommodate the construction work), whichever is lower, and capping as specified in the Nebraska Health and Human Services Regulation and Licensure, "Regulations Governing Water Well Construction, Pump Installation and Water Well Decommissioning Standards", 178 NAC 12, effective date February 12, 2005. All abandonment shall following the specific requirements for monitoring wells.

The work shall be measured for payment per each location that is shown on the plans, or as directed by the Engineer.

The work measured as provided herein, shall be paid for at the contract unit price per each for the item "Abandon Wells, Complete". This price shall be full compensation for all fees, labor, equipment, materials, permits and incidentals necessary to abandon the well in accordance with all local, state and federal requirements as specified in these Special Provisions.

FLOWABLE FILL

Existing concrete pipes and sewers to be abandoned in place shall be filled with a flowable fill material where shown on the plans or as directed by the Engineer. The flowable fill shall be placed as specified in Section 726 of the NDOR Standard Specifications and shall meet the requirements outlined in this Special Provision. The bulkheads or plugs constructed at the ends to seal the pipes shall not be paid for directly but shall be considered subsidiary to the flowable fill. Measurement and payment for the flowable fill used to abandon sewers shall be made based upon the contract unit price bid per cubic yard for the item "Flowable Fill". Said payment shall be full compensation for all labor, equipment, materials and incidentals required to fill the pipes to be abandoned in-place with the flowable fill including construction of necessary bulkheads, excavation, backfill, compaction, and pumping.

CASING PIPE

All smooth steel casing pipe shall conform to the requirements stipulated in the City of Lincoln Standard Specification for Municipal Construction, requirements outlined in these Special Provisions and the details shown on the plans.

The casing pipes and minimum wall thicknesses shown on the plans have been sized to allow the use of multiple water main materials and to provide a standard boring diameter. At the

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Contractor's option they may elect to use a different casing size as long as the size of the casing meets all requirements stipulated in the BNSF Utility Accommodation Policy which is attached to these Special Provisions. The minimum wall thickness of all casing pipes shall be based upon the diameter of the casing and the associated minimum pipe wall thickness shown in the current BNSF Utility Accommodation Policy for Non Coated Steel Casing Pipe.

Casing pipe shall be installed either by boring/jacking the pipe as specified in the Standard Specifications or casings that extend outside the limits of the railroad embankment may be installed utilizing open-trench construction as shown on the plans. Temporary shoring may be required as noted on the plans to allow for construction of the boring and receiving pits. Temporary shoring for casings will be paid for directly.

All ends of casing pipes that do not extend a minimum of 45 feet beyond the centerline of the nearest railroad track shall be sealed.

Construction of all steel casing pipes shall be measured and paid for by the linear foot in accordance with the contract unit price bid for "Smooth Steel Casing, Bored in Place, __"". Said payment shall be full compensation for furnishing all labor, equipment, tools and materials required to construct the casings to the lines and grades shown on the plans including all casing spacers and other items required to support the carrier pipe that will be installed through the casing. The carrier water main pipe will be paid for directly.

POTHOLING OF EXISTING SANITARY SEWERS

This work shall consist of the potholing or excavating at sanitary sewers to verify size and to determine the flow line of the sewer at the locations where the new construction will tie in with the existing sewer system. The Contractor shall pothole or excavate down to the existing sewer line and verify the size and flow line. The Contractor shall report any discrepancies discovered during the potholing operations between the size of the existing sewer or flow lines shown on the plans for resolution prior to the start of the new sanitary sewer construction. All potholing work to verify size and flow lines at existing sewers shall be completed prior to the start of the sanitary sewer construction.

The basis of payment for POTHOLE EXISTING SANITARY SEWER PIPE shall be on an EACH basis. Such payment shall be full compensation for all excavation, removal, disposal, backfilling, materials, equipment, tools, labor, and incidentals necessary to complete the work.

BYPASS PUMPING FOR SANITARY SEWER CONSTRUCTION

Bypass pumping or temporary diversion of sanitary flows will be required for the construction of the sanitary sewer work associated with this project. This will include bypass pumping associated with the sanitary sewer work at the USPS property; bypass pumping for the sanitary sewer work along the future Q Street corridor (this pay item include the connections to all existing sewers). The contractor shall provide redundant bypass pumping during the reconstruction of the sanitary sewer. The pumping operations shall also have 24-hour standby capabilities. Bypass pumping will be paid for separately in accordance with the lump sum bid item "Bypass Pumping Station "XX" to Station "XX"" or "Bypass Pumping at Station "XX"". Said payment shall be full compensation for providing all equipment, labor, materials and incidental items required to bypass pump the sewage as necessary to facilitate construction of the

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sewers as shown on the plans. Existing flow data is available upon request and can be obtained from the Engineer.

RECONSTRUCT SANITARY SEWER MANHOLE

Existing sanitary sewer manholes that need to remain in place until future construction of the new sewer system is completed once the tracks have been relocated, will need to be reconstructed to extend the manholes to match the proposed grade for the site. This will require the Contractor to remove the existing top sections and add additional sections, new top sections (if necessary) and new ring and cover (if necessary) to raise the manholes to the rim elevations shown on the plans. This shall also include extending steps and all other incidentals to provide a complete and functional sewer manhole.

Measurement and payment for reconstructing the existing sanitary sewer manhole shall be made at the contract unit price bid per each for the pay item "Reconstruct Sanitary Sewer Manhole at Station XX+XX". Such payment shall be full compensation for furnishing all labor, equipment, tools, materials and incidentals to reconstruct the sanitary sewer manholes to the rim elevations shown on the plans.

REMOVE SANITARY SEWER PIPE

Existing sanitary sewer pipe shall be removed at the locations shown on the plans or as directed by the Engineer. Removal of the sanitary sewer pipe shall not be differentiated by size. Removal of the sanitary sewer pipe shall include all pipe removal, excavation, backfill and compaction to the lines and grades shown on the plans.

Measurement and payment for removal of existing sanitary sewer shall be made at the contract unit price bid per linear foot for the pay item "Remove Sanitary Sewer Pipe". Such payment shall be full compensation for furnishing all labor, equipment, tools, materials and incidentals to remove the sanitary sewer pipe including all necessary trench excavation, backfill and compaction. All excavation, backfill and compaction shall be completed in accordance with the requirements outlined in the Geotechnical Reports.

REMOVE GUARDRAIL

Removal of guardrail shall be in accordance with the requirements of Section 903 of the Nebraska Department of Roads Standard Specifications for Highway Construction. Measurement and payment shall be made per linear foot of guardrail removed in accordance with the contract bid item "Remove Guardrail". Said payment shall be full compensation for furnishing all labor, equipment, and materials for removal and disposal of all guardrail, posts, surfacing under guardrail and hardware that is not to be reused on the project.

REMOVE RETAINING WALL

The Contractor shall remove existing retaining walls at the locations shown on the plans or as directed by the Engineer. Removal of the retaining walls shall include the entire stem and footing. All material resulting from the removal of the walls shall be promptly disposed of off-site. Retaining walls that are to be partially removed with a portion of the wall to remain in place shall be carefully saw cut to provide neat lines and a smooth surface at the point of removal. The

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Contractor shall be required to provide any grouting, masonry or concrete repair work adjacent to the removal line to provide a sound surface at those portions of the wall to remain in place as directed by the Engineer. The Contractor shall backfill the area where the retaining walls are removed to match the existing grade elevations or the subgrade elevation for the proposed surfacing or the finished ground elevations at turf areas.

Payment for removal of existing retaining walls will not be differentiated by size or type and shall be paid for at the contract unit price bid per linear foot for the pay item "Remove Retaining Wall". This shall be full compensation for furnishing all labor, equipment, and material required for removal, disposal, backfill and compaction, and all other incidental items including saw cutting, grouting, masonry repair and concrete surface repair work required at those portions of existing walls that are to remain in place.

REMOVE PLATFORM

The Contractor shall remove the existing railroad platform at the locations shown on the plans or as directed by the Engineer. Removal of the platform shall include the entire footing. All material resulting from the removal of the platform shall be promptly disposed of off-site. Platforms that are to be partially removed with a portion of the platform to remain in place shall be carefully saw cut to provide neat lines and a smooth surface at the point of removal. The Contractor shall be required to construct a concrete end wall at the removal line to provide support for the platform and to contain any fill under the platform as shown on the plans or as directed by the Engineer. The Contractor shall backfill the area where the platform is removed to match the existing grade elevations or the subgrade elevation for the proposed surfacing or the finished ground elevations at turf areas.

The Contractor shall not begin any work associated with removal of the existing platform until the existing canopy has been removed. The canopy removal is to be completed by others and the Contractor shall coordinate their work with the JPA's contractor for the canopy removal. In addition the platform or canopy removal cannot begin until the BNSF has relocated their existing communication tower as the existing communication lines to the tower are supported by the existing canopy. Furthermore, work associated with removal of the platform shall be coordinated with the appropriate Amtrak officials and no removal work shall begin without first notifying Amtrak regarding the start of the work and obtaining approval that the proposed start date will not conflict with their operations.

Payment for removal of existing platforms will not be differentiated by size or type and shall be paid for at the contract unit price bid per linear foot for the pay item "Remove Platform". This shall be full compensation for furnishing all labor, equipment, and material required for removal, disposal, backfill and compaction, and all other incidental items including grouting, concrete end wall construction and any necessary surface repair work required at those portions of the existing platform that is to remain in place.

REMOVE POST

The Contractor shall remove existing posts including foundations at the locations noted on the plans or as directed by the Engineer. The Contractor shall contact the adjacent property owner or City of Lincoln (if the posts are within the right-of-way) prior to removal of the post to determine if the property owner or City would like to retain the salvaged post for reinstallation at

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the completion of the project. If the property owner does not want the salvaged post than the Contractor shall properly dispose of the post off site. The Contractor shall exercise care in the removal of all posts to be salvaged so as not to damage the post.

The Contractor shall backfill the area where the foundation or concrete base for the post is removed to match the existing grade elevations or the subgrade elevation for the proposed surfacing or the finished ground elevations at turf areas. Foundations or concrete bases for posts shall be completely removed and promptly disposed of offsite.

Measurement and payment for removal of existing posts will not be differentiated by size or type and shall be paid for at the contract unit price bid per each for the pay item "Remove Post". Said payment shall be full compensation for furnishing all labor, equipment, and material required for removal, disposal, backfill and compaction, and all other incidental items required to remove and dispose of the existing posts or to salvage the posts in the event the adjacent property owner or City would like to retain the posts.

REMOVE AND SALVAGE BRICK PAVERS

The Contractor shall remove and salvage existing brick at the locations shown on the plans or as directed by the Engineer. The Contractor shall exercise extreme care when removing the pavers so as not to damage the bricks. The salvaged pavers that are in good, unbroken condition shall be delivered to the City of Lincoln Parks and Recreation Old Nursery storage yard located on Park Boulevard, south of South Street and Sherman Field. All damaged pavers shall be disposed of immediately off-site by the Contractor.

The Contractor shall coordinate the delivery of the brick pavers to the storage yard with the City. The City's contact person for this work is Jerry J. Shorney, phone number 402-441-8259.

Measurement and payment for removal and salvaging of existing brick pavers shall be paid for at the contract unit price bid per square foot for the pay item "Remove and Salvage Brick Pavers". Said payment shall be full compensation for furnishing all labor, equipment, and material required for removal, salvaging, delivery of the salvaged pavers to the City of Lincoln storage yard, and all other incidental items required to complete the work associated with removal and salvaging of the existing brick pavers on the project.

CRUSHED ROCK SURFACING

Crushed rock for surfacing at access roads within the project site as well as construction entrances shall be furnished and placed at the locations shown on the plans or as directed by the Engineer. All crushed rock for access roads and construction entrances shall be 2 inch to 3.5 inch rock or recycled concrete as shown on L.S.P. 176 for construction entrances. This includes the crushed rock delivery area at the north side of the proposed arena site.

Crushed rock surfacing for the finished roadway and parking area south of "R" Street which is proposed to be constructed following completion of the embankment construction shall meet the requirements outlined in Chapter 10 of the City of Lincoln Standard Specification for Municipal Construction.

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Crushed rock for surfacing at access roads and construction entrances including all incidental items associated with placement, compaction of the material and maintenance of the surfacing shall be measured and paid for at the contract unit price bid per ton for the item "Crushed Rock Surfacing (In Place)". This shall be full compensation for furnishing placing, compacting, and maintenance of the surfacing at the locations shown on the plans or as directed by the Engineer.

HARD SURFACING AT ACCESS ROADS

Hard surfacing for construction access roads shall be constructed at the locations shown on the plans or as directed by the Engineer. The hard surfacing shall be either 8" Concrete Pavement or 10" Asphaltic Concrete Pavement as selected by the Contractor. Asphalt shall be Asphaltic Concrete Surface Course Type 2P in accordance with the requirements of these Special Provisions. The Contractor shall have the option to provide either material for the hard surfacing subject to availability of the material and the approval of the Engineer.

Payment for hard surfacing at the construction access roads shall be paid for at the contract unit price bid per square yard for "Hard Surfacing at Access Roads". Such payment shall be full compensation for all labor, equipment, and material to furnish and place the hard surfacing including subgrade preparation, shoulder construction along the edge of the roadway, finishing, and all other incidental items required to provide a complete and functional roadway.

HIGH EARLY STRENGTH P.C. CONCRETE PAVEMENT

The Contractor shall provide High Early Strength Portland Cement Concrete for use at roadways and drives as shown on the plans or as directed by the Engineer to facilitate access to adjacent properties or opening of the roadways. High Early Strength Portland Cement Concrete for roadways and drives shall be City of Lincoln L5500 Concrete.

The Contractor, at his option, may elect to use the High Early Strength Concrete at other locations to facilitate his operations, subject to approval of the Engineer. Additional payment will not be made over and above the unit price bid for Concrete Pavement, for use of High Early Strength Concrete under these circumstances.

Payment for High Early Strength Concrete as shown on the plans shall be in accordance with the appropriate pay item and contract unit bid price. To facilitate construction of the project, the Engineer may direct the Contractor to use High Early Strength Concrete at locations other than those shown on the plans.

At locations where the contract has not established a unit price for the type and thickness of the High Early Strength Portland Cement Concrete to be constructed, the Contractor shall receive an additional payment of $12.00 per cubic yard (based upon the volume of the in-place concrete), in addition to the unit price specified for the type and thickness of the concrete pavement shown on the plans, for use of High Early Strength Portland Cement Concrete Pavement that is authorized by the Engineer.

The in-place volume of the concrete shall be calculated using the depth shown on the plans or shall be the depth specified by the Engineer.

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No substitution of fly ash for Portland Cement will be allowed for High Early Strength Concrete on this project.

CHAIN LINK FENCE

The Contractor shall construct permanent chain link fence at the locations shown on the plans or as directed by the Engineer. Permanent chain link fence shall be galvanized fence with the height as shown on the plans. Construction of the chain link fence shall be in accordance with the details shown on the plans and the requirements outlined in Chapter 9.00 of the City of Lincoln Standard Specifications for Municipal Construction.

Measurement and payment for the permanent chain link fence shall be made per linear foot of fence installed and accepted by the Engineer in accordance with the contract bid items "Chain Link Fence, ___" (In Place)". Said payment shall be full compensation for furnishing all labor, equipment, materials and incidentals required to install the fence in accordance with the details shown on the plans and in accordance with the specifications including all fencing, foundations for the fence posts, excavation, backfill and all other incidental items.

CHAIN LINK FENCE HORIZONTAL SLIDING/ROLLING GATES

The Contractor shall construct chain link fence horizontal sliding gates with rollers at the locations shown on the plans or as directed by the Engineer. Horizontal sliding gates shall conform to the requirements of ASTM F1184 Type II, Class 1 gates for steel or aluminum framed gates using external rollers. As part of the gate system the contractor shall provide a minimum four-foot wide, 8-inch thick concrete pad through the limits of the gate for the external roller to ride upon. The concrete strip shall not be paid for directly and shall be considered subsidiary to the gate.

The gates shall be galvanized in accordance with ASTM F 1083 and shall have chain link mesh to match the adjacent fence to be constructed under this project. The height of the gate shall be sized to match the height of the adjacent chain link fence. All chain link mesh shall conform to the requirements outlined for the adjacent chain link fence. Gate posts and adjacent line posts shall be sized as recommended by the gate manufacturer to ensure proper operation and support for the gate system. Welding for the gates shall comply with the requirements of AWS D1.2.

The gate shall be provided with appropriate hardware to secure the gate in the closed position from unauthorized entry. The hardware should allow the owner to utilize a standard commercial pad lock to secure the gates or other manufacturer approved locking mechanism as approved by the Engineer.

The Contractor shall submit product data, including the gate manufacturer's product data sheets for each gate to be supplied. The Contractor shall submit shop drawings showing the layout and details of gates including details of all posts and post foundations required to properly support the gate system and referenced specifications for gate material and finishes.

The Contractor shall comply with the manufacturer's recommendation for installation of the gates, including all product technical bulletins, product catalog installation instructions and product carton instructions that are provided with the gate.

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All gate posts and supporting posts for the gate system shall be set a minimum of 36-inches below grade with concrete foundations provided at each post. The top of the concrete foundation at the post shall be finished with a slope to direct water away from the posts. All posts shall be set plumb and in alignment with adjacent posts and shall be maintained in such a position during the placement and finishing of the concrete post foundations.

The Contractor shall exercise care to ensure the gates are installed level for proper operation. All gate hardware shall be attached by means which will prevent unauthorized removal. The Contractor shall adjust the gate following initial installation to ensure smooth operation of the gate and locking system.

Measurement and payment for furnishing and installation of horizontal sliding gates shall be measured and paid for per each in accordance with the contract bid item for "Horizontal Sliding Gate, __" Height". Said payment shall be full compensation for furnishing all labor, equipment, materials and incidentals required to install the gates including all gate posts, concrete pad for the rollers to ride upon, post foundations and all other incidentals to provide a complete and operational sliding gate in accordance with the requirements of this Special Provision and Chapter 9.00 of the City Standard Specifications.

SPECIAL STORM SEWER MANHOLE AT STA. "__"

The Contractor shall construct special storm sewer manholes at the locations shown on the plans and in accordance with the details shown. The special storm sewer manholes shall be constructed to the minimum interior vault dimensions as shown on the plans and shall use the City of Lincoln standard manhole ring and cover as detailed on City of Lincoln L.S.P. 162. All work associated with the special storm sewer manhole construction shall conform to the requirements outlined in Chapter 21 of the City of Lincoln Standard Specifications for Municipal Construction.

Special storm sewer manholes shall be paid for in accordance with the contract unit price bid for the item "Special Storm Sewer Manhole at Sta. "__"". Said Payment shall be full compensation for furnishing all labor, equipment, tools, materials and incidentals required to construct the manhole in accordance with the details shown on the plans including concrete construction, reinforcing steel, cast iron ring and cover, manhole steps, concrete invert construction, excavation, backfill, compaction and all other incidental work required to provide a complete and functional manhole.

72" STORM SEWER INLET

The Contractor shall provide steps at all 72" storm sewer inlets with depths greater than four feet. The depth of the inlet shall be measured from the top of the ring and cover to the flowline of the lowest pipe at the inlet. The steps shall be securely set in the walls of the inlet vault with concrete grout and in accordance with the requirements outlined in Chapter 21 of the Standard Specifications. The steps shall be in accordance with the details shown on L.S.P. 162. Direct payment shall not be made for furnishing and installing steps at storm sewer inlets and the cost associated with this work shall be considered subsidiary to the pay item for the storm sewer inlet.

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CORRUGATED METAL PIPE

Where shown on the plans or as directed by the Engineer, Corrugated Metal Pipe (CMP) culvert pipe shall be furnished and installed by the Contractor for construction of temporary drainage pipes to facilitate site drainage, this includes riser pipes at temporary silt basins. Corrugated metal pipe shall be in accordance with the requirements of Section 1035 of the NDOR Standard Specifications. Corrugated Metal Pipe be measured and paid for by the linear foot of pipe installed and accepted by the Engineer. Additional pipe length shall be included as outlined in the NDOR Standard Specifications to account for elbows at CMP pipes (7-feet for pipe sizes less than 36" diameter; 6-feet for pipe sizes 36" to 54" diameter and 5-feet for pipe sizes larger than 54" diameter). Such payment shall be full compensation for furnishing all labor, equipment and materials required to install the pipes as shown on the plans and as directed by the Engineer including all bedding, backfill, compaction, bends and connecting bands as required to complete the drainage system.

Corrugated Metal Pipe flared end sections shall be installed at the inlets to pipes at the locations shown on the plans or as directed by the Engineer. Corrugated Metal Pipe Flared End Sections shall be measured and paid for per each based upon the size to CMP pipe to which the flared end section connects. Such payment shall be full compensation for furnishing all labor, equipment and materials required to install the CMP flared end sections as shown on the plans.

HORIZONTALLY DIRECTIONALLY DRILLED WATER MAIN

Cert-Lok C900/RF restrained joint PVC pipe as manufactured by Certain Teed shall be used for all directionally drilled water mains. Measurement for directionally drilled water mains shall be horizontally along the longitudinal centerline of the pipe installed therein, from end to end. The unit price bid for directionally drilled water main shall include pipe materials, pipe couplings, and all other materials, equipment, and labor in connection with excavation and backfilling, bore pits, and those items related to directional drilling as listed in this special provision and any incidental work in accordance with the plans and Standard Specifications. Direct payment shall be made per linear foot for the various sizes of Horizontally Directionally Drilled Water Main list in the Bid Proposal.

TRACER WIRE FOR WATER MAINS

All tracer wire for water mains shall be Copperhead Industries High Strength Tracer Wire for Water Pipe or Engineer approved equal. This tracer wire shall be used for all new water main construction in lieu of the tracer wire specified in the Standard Specifications.

POTHOLING OF WATER SERVICES

This work shall consist of the potholing or excavating of all existing water services to determine location, size and material prior to reconnection or reconstruction and the restoration of the excavation to the original condition once reconstruction or reconnection has occurred. Work shall be completed in advance of construction to allow necessary adjustments in plan and profile.

The basis of payment for POTHOLE WATER SERVICE shall be on an EACH basis. Such payment shall be full compensation for all excavation, removal, disposal, backfilling, materials, equipment, tools, labor, and incidentals necessary to complete the work.

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WATER SERVICE RECONSTRUCTION

The Contractor shall have the ability to replace property owner's services from the curb stop into the business or residence when directed to perform this work by the Engineer. This work shall be coordinated with the replacement of the supply pipe from the water main to the curb stop in order to save costs for the property owner. The JPA/City shall provide advance notification to property owners that have galvanized or lead water services informing them that they can have their service replaced using the JPA's Contractor. The Lincoln Water System shall execute a Right of Entry Agreement with each property owner that requests this work to be done.

The Contractor shall prepare a price proposal for each property when directed to do so by the Engineer. The proposal shall be based on unit prices stated in the bid proposal for reconstruction of water services and other miscellaneous items required to complete the work. The Contractor shall be paid for this work as an extra work item on the contract.

If the property owner elects to have another Contractor construct their water service, the JPA's Contractor shall make every reasonable effort to coordinate work in a cost effective manner for the property owner.

WATER MAIN SHUTDOWNS

All water main shutdowns shall be performed by Lincoln Water System personnel upon request from the Contractor.

At least forty eight (48) hours prior to the time that tapping, valve operation, flushing or disinfection services are required, the Contractor shall notify the Assistant Superintendent of Water Construction or his representatives to provide for scheduling such services. These services shall be scheduled only during normal City working hours.

Additional notice shall be required when critical water customers such as industries, schools, day cares, medical facilities, etc are impacted by the shutdown. Interruptions of water service to critical customers may require Work to be performed outside normal Work hours or on weekends. The Lincoln Water System shall coordinate with the City’s Project Manager and notify the Contractor when critical customers are connected to the water main planned for shutdown.

Prior to Lincoln Water System making the shutdown, the Contractor shall be fully prepared to perform the work in the most expedient manner possible. The Contractor shall have all necessary fittings, pipe, tools, and accessories available onsite to perform the work. If in the opinion of Lincoln Water System or the City’s Project Manager that the contractor is not prepared to perform the work, a shutdown shall not be provided. This condition shall be not cause for claim of damages or additional compensation by the Contractor.

If the proposed work involves eight (8) inch or larger water mains or affects service to commercial and industrial customers, a plan must be submitted to Lincoln Water System for approval. The plan shall indicate all fittings and dimensions of any pieces to be installed to complete the work causing the shut down. The plan shall indicate the estimated time out of

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service, requested time for the shutdown, general description of how the work will be performed, required pumping equipment and the number of employees expected to perform the work.

The water main shall be excavated prior to the shutdown and the excavation prepared to make work conditions safe and clean. Where directed by Lincoln Water System or the City's Project Manager, the contractor shall use crushed rock or crushed concrete in the bottom of the excavation to provide a suitable work surface for ease of construction and to provide for sanitary conditions. These materials shall be compensated in accordance to applicable bid items.

Contractors shall be adequately equipped to pump drain water and anticipate some leakage of water past valves. Adequate pumping equipment shall be shall be a condition for approval of the shut down plan.

All parts, fittings and materials necessary to complete the work must be preassembled to the extent possible prior to the actual valve closure or the water will not be shut off.

There shall be no cost for a shut down which interrupts water service for less than two (2) hours. For interruptions of water service lasting two (2) or more hours the Contractor shall be billed the applicable fee for each hour or portion of an hour past the initial two (2) period of time. The shut down time shall be considered the time from when the water main has been isolated by the Lincoln Water System to the extent possible up to the time that Lincoln Water System is notified that work has been completed sufficiently to allow service to be restored.

Service fees charged for water main shutdowns shall be considered subsidiary to the cost of installation of the water main or the cost of the reconstructing or looping the water main or water services in the event of a utility conflict and shall not be cause for additional compensation to the contractor

TEMPORARY HYDRANTS AND BLOW-OFF FOR FLUSHING AND DISINFECTION

The Contractor shall provide temporary hydrants and blow-offs as shown on the plans or as determined by the Lincoln Water System to provide adequate discharge of water for preliminary and final flushing of the water main(s) in accordance with the requirements of AWWA C651. The installation of temporary hydrants and blow-offs shall include any necessary protection of surrounding areas from damage caused by water erosion and any other provisions necessary for the conveyance of discharge water to protect downstream facilities and property.

When called for in the proposal, payment for temporary hydrants and blow-offs used in conformance with the requirements outlined in the City of Lincoln's Standard Specification for Municipal Construction and these Special Provisions, and accepted by the Engineer shall be made at the contract unit price bid per each for the item "Temporary Hydrant and Blow-off". Such payment shall be full compensation for installation of temporary hydrants and blow-off, necessary erosion protection, discharge water conveyance and downstream protection, removal of temporary hydrant and blow-off and any materials, equipment, tools, labor or incidentals necessary to complete the work in accordance with the plans, Standard Specifications and the requirements outlined in these Special Provisions.

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GPS INFORMATION FOR WATER MAIN CONSTRUCTION

The Contractor shall provide GPS information for the water mains, valves and fittings that are constructed as part of this project.

The GPS information shall be obtained before backfilling the trench to obtain ties for the installed location of the pipeline center line at approximately 150 feet (5+/- feet) intervals along the pipeline. Other GPS points shall be taken at the following locations:

a. At beginning and ending of curves
b. All bends, tees, valves, connections
c. Plugged ends of lines, and other fittings and specials or other facilities
d. Both ends of all tunnel crossings and encasements
e. All corrosion protection materials, including anodes, test lead stations, and insulating flanges, if any.

If trench needs to be backfilled before GPS points are taken, install a temporary PVC pipe or tube or similar marker at the GPS points to obtain the GPS information. All temporary markers shall be removed and any holes shall be filled.

The GPS information shall include, but not be restricted to the x, y, and z coordinates of each item. GPS information shall also include as applicable, pipe size, type of fitting, type of valve, fire hydrant size, encasement size and material, number of turns to open/close each valve, and length of valve extension stem.

The GPS information shall meet the following requirements:

- Horizontal Accuracy: <0.75 inch (2cm)
- Vertical Accuracy: <1.50 inches (4 cm)
- Coordinate System: Lancaster County Grid System
- Vertical Datum: NAVD 88
- File Collection System: Export to individual shapefile for ESRI Geodatabases feature classes
- Items must be captured in individual shapefile based upon the individual feature classes

The Contractor shall generate field generated unique identification numbers for all items. The field generated number shall be indicated on the record drawings.

The type of fitting can be described as, but not limited to:

- VERTICAL BEND, TEE, REDUCER, PLUG, OFFSET, END OF MAIN, CROSS, 22-1/2 BEND, 90 BEND, 45 BEND, 11-1/4 BEND

The type of valve can be described as, but not limited to:

- TSV (tapping sleeve and valve), PRV (pressure reducing valve), LV (line valve), FHV (fire hydrant valve), VRV (vacuum relief valve), BOV (blow off valve), BOA (blow off assembly) FHT (fire hydrant tape), SVC (service valve), FLV (fire line valve), etc.

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The rod placement for obtaining GPS data shall be on the top center of the pipe for the pipeline, the top center of the fitting for the fittings, top of the operating nut and top center of valve for valves, the top of the operating nut for fire hydrants, top center of manhole covers and access pits, top of the vault for test lead stations, top center of the pipe for the pipeline at both ends of the encasement pipe, and at other locations as required and acceptable to the Owner.

Submittals

GPS information, including the electronic Geodatabases shapefile shall be made on a paper form of the GPS electronic Geodatabases shapefile acceptable to Owner as the Work progresses. Contractor shall bring GPS electronic Geodatabases shapefile form to each progress meeting for review. Satisfactory, complete, and current GPS electronic Geodatabases shapefile form will be a condition for recommendation of progress payment applications and for final payment.

Basis of Payment

Payment for the item "GPS Information for Water Main Construction" shall be made at the contract lump sum amount bid for the pay item "GPS Information for Water Main Construction". The amount of the lump sum to be included in each partial payment shall be in proportion to the value of the work completed with respect to the total amount of the original bid for the water main construction items.

REMOVE WATER METER VAULT, COMPLETE

The Contractor shall remove the existing water meter vault including all related piping, valves, meters, backflow preventer and all other appurtenance items at the location shown on the plans. All water meters, backflow preventers and valves associated with the vault shall be salvaged prior to demolition of the vault and delivered to the Lincoln Water Systems at 2021 North 27th Street. Upon completion of the removal work the Contractor shall backfill the area to the match the adjacent ground and to provide proper drainage. All backfill shall be compacted in accordance with the requirements outlined in the Geotechnical Report.

Measurement and payment for removal of the existing water meter vault shall be made at the lump sum price bid for the pay item "Remove Water Meter Vault, Complete". Such payment shall be full compensation for furnishing all labor, equipment, tools materials and incidentals required to remove the existing water meter vault including all appurtenant equipment and piping, salvaging/delivery of meters, backflow devices and valves to LWS, and backfill of the area where the vault is removed to match the adjacent ground in accordance with the requirements outlined in the City of Lincoln Standard Specification for Municipal Construction and these Special Provisions.

PARKING METER POST

The Contractor shall furnish and install galvanized steel parking meter posts at the locations shown on the plans. The meter posts shall be fabricated and installed in accordance with the details shown on the plans. The length of the meter posts for locations where the posts will be set within the concrete sidewalk shall be 50 ½ inches. The length of meter posts to be set in turf/dirt areas shall be 63 inches. The top of all installed meter posts shall be 42 inches above the finished grade.

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Meter posts shall be nominal 2-inch diameter Schedule 40, threaded and coupled, galvanized steel pipe meeting the requirements of ASTM A-53 Grade B. All meter posts shall be provided with three 5/16 inch diameter weep holes at the bottom of the posts as shown on the plans. The posts shall be set 1'-6" behind the back of the curb and shall be either cast in-place with construction of the concrete sidewalk or they may be set by coring the sidewalk and setting the post in the cored hole with an approved post setting cement.

The work associated with furnishing and installing the parking meter posts shall not be differentiated by length of post and shall be measured and paid for in accordance with the contract unit price bid per each for the pay item "Parking Meter Post". Said payment shall be full compensation for furnishing all labor, equipment, materials and incidentals required to furnish and install the new meter posts in accordance with the details shown on the plans including any core drilling at the sidewalks that may be required to complete the installation.

FINE GRADING/PARKING SPACE FINISH

All areas to be sodded or permanently seeded shall be fine graded prior to installation of the sod or seeding. Fine graded areas shall be completed to match the finished grades and lines indicated on the plans. All work associated with the fine grading shall be completed in accordance with the requirements outlined for parking space finish in Chapter 2.00 of the City Standard Specifications.

Payment for fine grading at areas disturbed by grading and in conformance with the City Standard Specifications shall be measured and paid for at the contract unit price bid per square yard for the item "Parking Space Finish". Such payment shall be full compensation for furnishing all labor, equipment, materials and incidental items required to complete the fine grading in accordance with the requirements outlined in the Specifications.

SEEDING TYPE "B"

Type "B" Seeding on this project shall consist of United Seeds Super Turf II Turf Type Tall Fescue/Kentucky Bluegrass/Perennial Ryegrass Mixture. Section 30.05 of the City of Lincoln Standard Specifications for Municipal Construction is amended to incorporate the following criteria for the Type "B" seed mixture:

Super Turf Type II LS
Contains: 88% Turf Type Tall Fescue (Firecracker LS, Spyder LS, Mustang 4 and Firenza Turf Type Tall Fescue), 7% Blue Chip Plus and Everest Kentucky Bluegrass and 5% La Quinta Perennial Ryegrass.

Seeding Rates
New Seeding: 10 Lbs per 1,000 Sq ft
Over-seeding: 5 Lbs per 1,000 Sq Ft
Over-seeding High Use Areas: 12 Lbs 1,000 Sq Ft

Seeding Dates
March - May, August - October
Dormant Seed - December – March

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Permanent seeding, fertilizing and mulching of the site shall be provided at all finish graded areas outside the limits of the proposed construction at the new arena and rock/hard surfaced access road areas upon completion of site grading operations.

SEEDING AND SODDING ESTABLISHMENT

Section 30.11 of the City of Lincoln Standard Specification for Municipal Construction shall be amended to stipulate that the Contractor shall be responsible for adequately watering and maintaining all sodded areas for a period of thirty (30) days following the initial sodding operation (maintenance of sodded areas shall include all required daily watering, weed control, maintenance fertilizing and mowing). Any portion of the sodded area that is not in good growing condition at the end of this thirty (30) day period shall be removed and replaced with fresh live sod at the expense of the Contractor. If the sod has been replaced the watering and maintenance period shall begin again for thirty (30) days following the replacement.

Section 30.11 of the City of Lincoln Standard Specification for Municipal Construction shall also be amended to stipulate that the Contractor shall be responsible for maintaining of all seeded areas for a period of forty-five (45) days following the initial seeding operation (maintenance of seeded areas shall include all required daily watering, weed control, maintenance fertilizing and mowing). Any portion of the seeded area that is not in good growing condition at the end of this thirty (45) day period shall be removed and reseeded with new seed at the expense of the Contractor. If the seed has been replaced, the watering and maintenance period shall begin again for forty-five (45) days following the replacement. If the Contractor does not comply with these standards, then liquidated damages will be enforced until the area is acceptable to the Engineer.

COVER CROP SEEDING

The Contractor shall provide cover crop seeding at all disturbed or cleared areas where pavement construction, finished grading or other construction activities will not be starting within 21 days or as directed by the Engineer to control erosion. The cover crop seed shall be a perennial rye grass and shall be seeded at a rate of three pounds per 1,000 square feet unless an alternate seed mixture and seeding rate is approved by the Engineer. The seeded areas shall be fertilized and mulched in accordance with the requirements of Chapter 30 of the City of Lincoln Standard Specifications for Municipal Construction. The Contractor shall water and maintain the areas to be cover crop seeded as specified in the section “Seeding and Sodding Establishment”. Cover crop seeding shall be measured by the acre and such payment shall be full compensation for furnishing all labor, equipment, materials and incidental items including seed, mulch and fertilizer required to establish the cover crop.

IRRIGATION

The Contractor shall reconstruct the existing irrigation system as shown on the plans including temporary removal of the existing backflow and meter devices and existing sprinkler heads that will be in conflict with temporary pavements. For this project there will be reconstruction of the existing 7th Street irrigation system at the median to accommodate the temporary pavement. All work associated with reconstruction and testing of the irrigation systems shall comply with the requirements outlined in Chapter 33 of the City of Lincoln Standard Specifications and as amended by this Special Provision.

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For reconstruction of the existing systems the Contractor shall be responsible for preliminary investigative work to determine existing irrigation pipe locations as well as the location of existing sprinkler heads, meters and backflow devices. The reconstruction work shall include all necessary removal and reinstallation of the existing water meter/backflow preventer, enclosure, control boxes and sprinkler heads as shown on the plans or as directed by the Engineer to accommodate construction of the temporary pavement.

Measurement and payment for the irrigation work shall be one lump sum and shall include all of the work associated with reconstruction of the individual systems specified on the plans. This shall include all labor, equipment, materials and incidentals required to remove, temporarily store and reinstall the irrigation system meter, backflow device, enclosure, sprinkler heads, reconstruction of piping that may be damaged as part of the construction/removal of the temporary pavement and all other components and incidental items required to restore the irrigation system following removal of the temporary pavement and reconstruction of the new curbs and sidewalks. The Contractor shall be required to include new piping as required and any new sprinkler heads to replace those that may be damaged as part of the work.

EROSION CONTROL BLANKET (ECB)

A. GENERAL

Erosion Control Blankets are a temporary, degradable rolled erosion control product composed of natural or polymer yarns woven into a matrix, used to provide erosion control and facilitate vegetation establishment.

B. MATERIALS

1. Type I Erosion Control Blanket shall be constructed of 100% agricultural straw evenly distributed across the entire blanket, covered with a photodegradable polypropylene net having an approximate 0.5 x 0.5 inch net opening, a mass per unit area of 0.40 lbs/sy, and a functional longevity of 12 months.

2. Type II Erosion Control Blanket shall be constructed with 70% agricultural straw and 30% coconut fiber evenly distributed across the entire blanket, stitched with degradable thread between a heavy weight UV stabilized polypropylene top net with an approximate 0.63 x 0.63 inch net opening, and a lightweight photodegradable polypropylene bottom net, having an approximate 0.5 x 0.5 inch net opening, a mass per unit area of 0.5 lbs/sy and a functional longevity of 24 months.

3. Type IBD Erosion Control Blanket shall be constructed with 100% biodegradable materials containing a 100% agricultural straw fiber matrix evenly distributed across the entire blanket, covered with a biodegradable natural organic fiber netting having an approximate 0.5 x 1.0 inch net opening, a mass per unit area of 0.47 lbs/sy, and a functional longevity of 12 months.

4. Type IIBD Erosion Control Blanket shall be constructed with 100% biodegradable materials containing 70% agricultural straw and 30% coconut fiber matrix evenly distributed across the entire blanket, covered on the top and bottom with

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biodegradable natural organic fiber netting having an approximate 0.5 x 1.0 inch net opening, a mass per unit area of 0.6 lbs/sy and a functional longevity of 18 months.

5. Metal staples for installation shall be No. 11 gauge wire and at least six inches long.

6. 100% natural fasteners shall be at least six inches long.

C. INSTALLATION

Installation shall occur as soon as possible after finish grading operations and/or seeding have been complete, or as directed by the City's Project Manager. On shallow slopes, less than 4H:1V, the blankets may be installed parallel across the slope. On steep slopes, 4H:1V or greater, the blankets shall be installed perpendicular down the slope. In ditches and drainage channels the blankets shall be installed parallel to the direction of flow and in such a manner as to avoid seams along the channel bottom. Entrenchment and overlap shall be as recommended by the manufacturer.

Staples or fasteners will be placed according to the manufacturer. The installation procedures shall ensure that the Erosion Control Blanket will remain in intimate contact with the soil for its period of functional longevity or until such time as full growth of the vegetation occurs. In loose soils, staples or fasteners of greater than 6 inches may be required to properly secure the blanket. 100% natural fasteners will be required when securing biodegradable blankets.

D. MAINTENANCE

If, during required inspections, erosion or undermining beneath the blanket is observed, the blanket shall be pulled back and any lost soil shall be replaced and the area shall be reseeded. After reseeding, the blanket shall be reinstalled as detailed above. Maintenance shall be completed within twenty-four (24) hours of inspection if site conditions are conducive.

E. BASIS OF PAYMENT

Erosion Control Blanket shall be paid for at the contract unit price bid per square yard (SY) for TYPE I ECB and TYPE II ECB and TYPE IBD ECB and TYPE IIBD ECB as measured by the visible surface area after installation is complete. This price shall be full compensation for furnishing, preparing, transporting, delivering and placing the materials, and for all labor, tools, equipment and incidentals necessary to complete the installation and maintenance of the Work.

BNSF RAILWAY SPECIAL PROVISIONS

The following Exhibit "C" provides the Contractor Requirements for work that will be completed on existing BNSF Railway property as part of this project. The Contractor shall be required to strictly adhere to all requirements as outlined and shall coordinate their work with the BNSF's Project Engineer, Gerald Maczuga or other designated representative at all times during completion of work on railroad property.

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In addition the Contractor will be required to execute the attached agreement Exhibit C-1A and provide certification of the required insurance coverages outlined in the agreement to the BNSF Railway prior to start of any work on railroad property.

Flagging will be required when work is required on BNSF property within 25 feet of the existing tracks and when the Contractor is using any of the temporary construction accesses across the BNSF tracks. Flagging services shall be performed by BNSF employees as outlined in the following Contractor's Requirements for work on BNSF Railway property. The cost of the flagging up to a maximum amount of $150,000 shall be borne by the JPA. The $150,000 amount of flagging is based upon 150 flagging days using a standard 10-hour work day and the BNSF requiring a single flagger for this work. If the BNSF requires additional flaggers than the maximum amount is subject to change as determined by the Engineer. All flagging costs in excess of the $150,000 amount shall be deducted from the retainage held on the project prior to final payment.

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EXHIBIT C
Contractor Requirements

1.01 General

- **1.01.01** The Contractor must cooperate with **BNSF RAILWAY COMPANY**, hereinafter referred to as "Railway" during the performance of the C&M Work (as defined in Exhibit C-1) and any other work over, under, on or adjacent to Railway Property.

- **1.01.02** The Contractor must execute and deliver to the Railway duplicate copies of the Exhibit C-1 Contractor Right of Entry for C&M Work, in the form attached hereto, obligating the Contractor to provide and maintain in full force and effect the insurance called for under Section 3 of said Exhibit C-1. Questions regarding procurement of the Railroad Protective Liability Insurance should be directed to Rosa Martinez at Marsh, USA, 214-303-8519.

- **1.01.03** The Contractor must plan, schedule and conduct all C&M Work activities so as not to interfere with the movement of any trains on Railway Property.

- **1.01.04** The Contractor's right to enter Railway Property is subject to the absolute right of Railway to cause the Contractor's work on Railway Property to cease if, in the opinion of Railway, Contractor's activities create a hazard to Railway Property, employees, and/or operations. Railway will have the right to stop construction work on the C&M Work if any of the following events take place: (i) Contractor (or any of its subcontractors) performs the C&M Work in a manner contrary to the plans and specifications approved by Railway; (ii) Contractor (or any of its subcontractors), in Railway's opinion, prosecutes the C&M Work in a manner which is hazardous to Railway Property, facilities or the safe and expeditious movement of railroad traffic; or (iii) the insurance described in the attached Exhibit C-1 is canceled during the course of the C&M Work. The work stoppage will continue until all necessary actions are taken by Contractor or its subcontractor to rectify the situation to the satisfaction of Railway's Division Engineer or until additional insurance has been delivered to and accepted by Railway. Any such work stoppage under this provision will not give rise to any liability on the part of Railway. Railway's right to stop the C&M Work is in addition to any other rights Railway may have including, but not limited to, actions or suits for damages or lost profits. In the event that Railway desires to stop the C&M Work, Railway agrees to immediately notify the following individual in writing:

  Roger Figard, City Engineer
  Department of Public Works and Utilities
  City of Lincoln, Nebraska
  555 South 10th Street
  Lincoln, NE 68508

- **1.01.05** Contractor shall, and shall cause all Contractor parties to, strictly comply with all federal, state and local environmental laws and regulations in its use of Railway's Property, including, but not limited to, the Resource Conservation and Recovery Act, as amended (RCRA), the Clean Water Act, the Oil Pollution Act, the Hazardous Materials Transportation Act, CERCLA (collectively, the "**Environmental Laws**") with respect to Railway's Property. Contractor shall not maintain a "treatment," "storage," "transfer" or "disposal" facility, or "underground storage tank," as those terms are defined by Environmental Laws, on Railway's Property. Contractor shall not handle, transport, release or suffer the release of "hazardous waste" or "hazardous substances", as "hazardous waste" and "hazardous substances" may now or in the future be defined by any Environmental Laws, except as may

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be pre-existing in Railway Property and as encountered in the C&M Work and then only in compliance with Environmental Laws, and shall not use any soils or other materials containing hazardous waste or hazardous substances in connection with the C&M Work, or otherwise bring any hazardous waste or hazardous substances onto any Railway Property.

Contractor shall give Railway immediate notice to Railway's Resource Operations Center at (800) 832-5452 in the event of any release of hazardous substances on or from Railway Property, violation of Environmental Laws, or inspection or inquiry by governmental authorities charged with enforcing Environmental Laws with respect to Contractor's use of Railway Property. Contractor shall use best efforts to promptly respond to any release arising from or related to its activities contemplated in the C&M Work. Contractor shall also give Railway notice of all measures undertaken on Contractor's behalf to investigate, remediate, respond to or otherwise cure such release or violation.

In the event Contractor has notice of a release or violation of Environmental Laws which occurred or may occur as a result of Contractor's activities contemplated in the C&M Work, Contractor shall take timely measures to investigate, remediate, respond to or otherwise cure as required by applicable law such release or violation affecting Railway Property or improvements. If during the C&M Work, soils or other materials considered to be environmentally contaminated are exposed, Contractor will remove and safely dispose of said contaminated soils. Determination of soils contamination and applicable disposal procedures thereof will be made only by an agency having the capacity and authority to make such a determination.

Contractor agrees to periodically to furnish Railway upon written request with reasonable proof that it is in compliance with this **Section 1.01.05**.

- **1.01.06** All C&M Work must performed (i) in a good and workmanlike manner, (ii) in accordance with plans and specifications approved in advance by Railway (the "**Approved Plans**"), (iii) in conformance with applicable building codes and all applicable engineering, safety and any and all laws, statutes, regulations, ordinances, orders, covenants, restrictions, or decisions of any court of competent jurisdiction ("**Legal Requirements**"), (iv) in accordance with the accepted industry standards of care, skill and diligence, and (v) in such a manner as shall not adversely affect the structural integrity or maintenance of any Railway improvements or other improvements on or near Railway Property, or any lateral support of any structures adjacent to or in the proximity of any Railway improvements or Railway Property. In addition, the C&M Work must be promptly commenced by the Contractor and thereafter diligently prosecuted to conclusion in its logical order and sequence. Furthermore, any changes or modifications of the C&M Work which affect Railway will be subject to Railway's written approval prior to the commencement of any such changes or modifications from the Railway's Project Engineer.

- **1.01.07** Contractor shall be responsible for all job site cleanup and restoration, including removal of all construction materials, concrete debris, surplus soil, refuse, contaminated soils, asphalt debris, litter and other waste materials resulting from the C&M Work to the reasonable satisfaction of Railway's Division Engineer.

- **1.01.08** The Contractor must notify the City at City's City Engineer, telephone number (402) 441-7567 and Railway's Project Engineer, telephone number (402) 458-7537 at least ten (10) calendar days before commencing any C&M Work on Railway Property.

- **1.01.09** For any bridge demolition and/or falsework above any tracks or any excavations located with any part of the excavations located within, whichever is greater, twenty-five (25)

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feet of the nearest track or intersecting a slope from the plane of the top of rail on a 2 horizontal to 1 vertical slope beginning at eleven (11) feet from centerline of the nearest track, both measured perpendicular to center line of track, the Contractor must furnish the Railway five sets of working drawings showing details of construction affecting Railway Property and tracks. The working drawing must include the proposed method of installation and removal of falsework, shoring or cribbing, not included in the contract plans and two sets of structural calculations of any falsework, shoring or cribbing. For all excavation and shoring submittal plans, the current "BNSF-UPRR Guidelines for Temporary Shoring" must be used for determining the design loading conditions to be used in shoring design, and all calculations and submittals must be in accordance with the current "BNSF-UPRR Guidelines for Temporary Shoring". All submittal drawings and calculations must be stamped by a registered professional engineer licensed to practice in the state the project is located. All calculations must take into consideration railway surcharge loading and must be designed to meet American Railway Engineering and Maintenance-of-Way Association (previously known as American Railway Engineering Association) Coopers E-80 live loading standard. All drawings and calculations must be stamped by a registered professional engineer licensed to practice in the state the project is located. The Contractor must not begin C&M Work until notified by the Railway that plans have been approved, which approved plans shall become part of the Approved Plans. The Contractor will be required to use lifting devices such as, cranes and/or winches to place or to remove any falsework over Railway's tracks. In no case will the Contractor be relieved of responsibility for results obtained by the implementation of the Approved Plans.

- **1.01.10** Subject to the movement of Railway's trains, Railway will cooperate with the Contractor such that the C&M Work may be handled and performed in an efficient manner. The Contractor will have no claim whatsoever for any type of damages or for extra or additional compensation in the event his work is delayed by the Railway.

1.02 Contractor Safety Orientation

- **1.02.01 No employee of the Contractor, its subcontractors, agents or invitees may enter Railway Property without first having completed Railway's Engineering Contractor Safety Orientation, found on the web site www.contractororientation.com. The Contractor must ensure that each of its employees, subcontractors, agents or invitees completes Railway's Engineering Contractor Safety Orientation through internet sessions before any C&M Work is performed. Additionally, the Contractor must ensure that each and every one of its employees, subcontractors, agents or invitees possesses a card certifying completion of the Railway's Engineering Contractor Safety Orientation before entering Railway Property. The Contractor is responsible for the cost of the Railway's Engineering Contractor Safety Orientation. The Contractor must renew the Railway's Engineering Contractor Safety Orientation annually. Further clarification can be found on the web site or from the Railway's Project Engineer.**

1.03 Railway Requirements

- **1.03.01** The Contractor must take protective measures as are necessary to keep railway facilities, including track ballast, free of sand, debris, and other foreign objects and materials resulting from his operations. Any damage to railway facilities resulting from Contractor's operations will be repaired or replaced by Railway and the cost of such repairs or replacement must be paid for by the Contractor.

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- **1.03.02** The Contractor must notify Railway's Project Engineer, telephone number (402) 458-7537, and provide blasting plans to the Railway for review seven (7) calendar days prior to conducting any blasting operations adjacent to or on Railway Property.

- **1.03.03** The Contractor must abide by the following temporary clearances during construction:

  - 15' Horizontally from centerline of nearest track
  - 21'-6" Vertically above top of rail
  - 27'-0" Vertically above top of rail for electric wires carrying less than 750 volts
  - 28'-0" Vertically above top of rail for electric wires carrying 750 volts to 15,000 volts
  - 30'-0" Vertically above top of rail for electric wires carrying 15,000 volts to 20,000 volts
  - 34'-0" Vertically above top of rail for electric wires carrying more than 20,000 volts

- **1.03.04** Upon completion of construction, the following clearances shall be maintained:

  - 25' Horizontally from centerline of nearest existing or future track to the face of the pier or abutment structure
  - 31' Vertically above top of rail to the bottom of the Pedestrian Bridge

- **1.03.05** Any infringement within State statutory clearances due to the Contractor's operations must be submitted to the Railway and to the City and must not be undertaken until approved in writing by the Railway, and until the City has obtained any necessary authorization from the State Regulatory Authority for the infringement. No extra compensation will be allowed in the event the Contractor's C&M Work is delayed pending Railway approval, and/or the State Regulatory Authority's approval.

- **1.03.06** In the case of impaired vertical clearance above top of rail, Railway will have the option of installing tell-tales or other protective devices Railway deems necessary for protection of Railway operations. The cost of tell-tales or protective devices will be borne by the Contractor.

- **1.03.07** The details of construction affecting the Railway Property and tracks not included in the City Work Final Design or Approved Plans for the C&M Work must be submitted to the Railway by the City for approval before work is undertaken and this work must not be undertaken until approved by the Railway.

- **1.03.08** At other than public road crossings, the Contractor must not move any equipment or materials across Railway's tracks until permission has been obtained from the Railway. The Contractor must obtain a "Temporary Construction Crossing Agreement" from the Railway prior to moving his equipment or materials across Railway's tracks. The temporary crossing must be gated and locked at all times when not required for use by the Contractor. The temporary crossing for use of the Contractor will be constructed and, at the completion of the project, removed at the expense of the Contractor.

- **1.03.09** Discharge, release or spill on the Railway Property of any hazardous substances, oil, petroleum, constituents, pollutants, contaminants, or any hazardous waste is prohibited and Contractor must immediately notify the Railway's Resource Operations Center at 1(800) 832-5452, of any discharge, release or spills in excess of a reportable quantity. Contractor

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must not allow Railway Property to become a treatment, storage or transfer facility as those terms are defined in the Resource Conservation and Recovery Act or any state analogue.

- **1.03.10** The Contractor, upon completion of the C&M Work, must promptly remove from the Railway Property all of Contractor's tools, equipment, implements and other materials, whether brought upon said Railway Property by Contractor or any subcontractor, employee or agent of Contractor or of any subcontractor, and must cause Railway Property to be left in a condition acceptable to Railway's Project Engineer.

1.04 Contractor Roadway Worker on Track Safety Program and Safety Action Plan

- **1.04.01** Each Contractor that will perform C&M Work within 25 feet of the centerline of a track must develop and implement a Roadway Worker Protection/On Track Safety Program and work with Railway's Project Engineer to develop an on track safety strategy as described in the guidelines listed in the on track safety portion of the Safety Orientation. This Program must provide Roadway Worker protection/on track training for all employees of the Contractor, its subcontractors, agents or invitees. This training is reinforced at the job site through job safety briefings. Additionally, each Contractor must develop and implement the Safety Action Plan, as provided for on the web site **www.contractororientation.com**, which will be made available to Railway prior to commencement of any work on Railway Property. During the performance of C&M Work, the Contractor must audit its C&M Work activities. The Contractor must designate an on-site Project Supervisor who will serve as the contact person for the Railway and who will maintain a copy of the Safety Action Plan, safety audits, and Material Safety Datasheets (MSDS), at the job site.

  Contractors shall ensure its employees, subcontractors and agents are United States citizens or legally working in this country under a work VISA.

1.05 Railway Flagger Services:

- **1.05.01** The Contractor must give Railway's Project Engineer, telephone number (402) 458-7537, a minimum of thirty (30) calendar days advance notice when flagging services will be required so that the Roadmaster can make appropriate arrangements (i.e., bulletin the flagger's position). If flagging services are scheduled in advance by the Contractor and it is subsequently determined by the parties hereto that such services are no longer necessary, the Contractor must give the Roadmaster five (5) working days advance notice so that appropriate arrangements can be made to abolish the position pursuant to union requirements.

- **1.05.02** Unless determined otherwise by Railway's Project Engineer, Railway flagger will be required and furnished when Contractor's C&M Work activities are located over, under and/or within twenty-five (25) feet measured horizontally from centerline of the nearest track and when cranes or similar equipment positioned beyond 25-feet from the track centerline could foul the track in the event of tip over or other catastrophic occurrence, but not limited thereto for the following conditions:

- **1.05.02a** When, upon inspection by Railway's Project Engineer, other conditions warrant.

- **1.05.02b** When any excavation is performed below the bottom of tie elevation, if, in the opinion of Railway's Project Engineer, track or other Railway facilities may be subject to movement or settlement.

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- **1.05.02c** When C&M Work in any way interferes with the safe operation of trains at timetable speeds.

- **1.05.02d** When any hazard is presented to Railway track, communications, signal, electrical, or other facilities either due to persons, material, equipment or blasting in the vicinity.

- **1.05.02e** Special permission must be obtained from the Railway before moving heavy or cumbersome objects or equipment which might result in making the track impassable.

- **1.05.03** Flagging services will be performed by qualified Railway flaggers.

- **1.05.03a** Flagging crew generally consists of one employee. However, additional personnel may be required to protect Railway Property and operations, if deemed necessary by Railway's Project Engineer.

- **1.05.03b** Each time a flagger is called, the minimum period for billing will be the eight (8) hour basic day.

- **1.05.03c** The cost of flagger services provided by the Railway will be borne by City. The estimated cost for one (1) flagger is approximately between $800.00-$1,600.00 for an eight (8) hour basic day with time and one-half or double time for overtime, rest days and holidays. The estimated cost for each flagger includes vacation allowance, paid holidays, Railway and unemployment insurance, public liability and property damage insurance, health and welfare benefits, vehicle, transportation, meals, lodging, radio, equipment, supervision and other costs incidental to performing flagging services. Negotiations for Railway labor or collective bargaining agreements and rate changes authorized by appropriate Federal authorities may increase actual or estimated flagging rates. **THE GOVERNMENTAL FLAGGING RATE IN EFFECT AT THE TIME OF PERFORMANCE BY THE CONTRACTOR HEREUNDER WILL BE USED TO CALCULATE THE ACTUAL COSTS OF FLAGGING PURSUANT TO THIS PARAGRAPH.**

- **1.05.03d** The average train traffic on this route is 65 freight trains per 24-hour period at a timetable speed of 40 MPH and 2 passenger trains at a timetable speed of 15 MPH.

1.06 Contractor General Safety Requirements

- **1.06.01 C&M Work in the proximity of railway track(s) is potentially hazardous where movement of trains and equipment can occur at any time and in any direction. All work performed by contractors within 25 feet of any track must be in compliance with FRA Roadway Worker Protection Regulations. No Contractor shall conduct any tests, investigations or any other activity using mechanized equipment and/or machinery, or place or store any mechanized equipment, tools or other materials, within twenty-five (25) feet of the centerline of any railroad track on Railway Property, except after Contractor has obtained written approval from Railway Director Engineering Services, and then only in strict accordance with the terms and any conditions of such approval.**

- **1.06.02 Before beginning any task on Railway Property, a thorough job safety briefing must be conducted with all personnel involved with the task and repeated when the personnel or task changes. If the task is within 25 feet of any track, the job briefing <u>must</u> include the Railway's flagger, as applicable, and include the procedures**

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the Contractor will use to protect its employees, subcontractors, agents or invitees from moving any equipment adjacent to or across any Railway track(s).

- **1.06.03 Workers must not work within 25 feet of the centerline of any track without an on track safety strategy approved by Railway's Project Engineer. When authority is provided, every contractor employee must know: (1) who the Railway flagger is, and how to contact the flagger, (2) limits of the authority, (3) the method of communication to stop and resume work, and (4) location of the designated places of safety. Persons or equipment entering flag/work limits that were not previously job briefed, must notify the flagger immediately, and be given a job briefing when working within 25 feet of the center line of track.**

- **1.06.04 When Contractor employees are required to work on Railway Property after normal working hours or on weekends, Railway's Project Engineer must be notified. A minimum of two employees must be present at all times.**

- **1.06.05** Any employees, agents or invitees of Contractor or its subcontractors under suspicion of being under the influence of drugs or alcohol, or in the possession of same, will be removed from the Railway Property and subsequently released to the custody of a representative of Contractor management. Future access to the Railway Property by that employee will be denied.

- **1.06.06** Any damage to Railway Property, or any hazard noticed on passing trains must be reported immediately to the Railway's Project Engineer. Any vehicle or machine which may come in contact with track, signal equipment, or structure (bridge) and could result in a train derailment must be reported immediately to the Railway's Project Engineer and to the Railway's Resource Operations Center at 1 (800) 832-5452. Local emergency numbers are to be obtained from Railway's Project Engineer prior to the start of any C&M Work and must be posted at the job site.

- **1.06.07** For safety reasons, all persons are prohibited from having pocket knives, firearms or other deadly weapons in their possession while working on Railway Property.

- **1.06.08** All personnel protective equipment (PPE) used on Railway Property must meet applicable OSHA and ANSI specifications. Current Railway personnel protective equipment requirements are listed on the web site, **www.contractororientation.com,** however, a partial list of the requirements include: a) safety glasses with permanently affixed side shields (no yellow lenses); b) hard hats c) safety shoe with: hardened toes, above-the-ankle lace-up and a defined heel; and d) high visibility retro-reflective work wear. The Railway's Project Engineer is to be contacted regarding local specifications for meeting requirements relating to hi-visibility work wear. Hearing protection, fall protection, gloves, and respirators must be worn as required by State and Federal regulations. **(NOTE – Should there be a discrepancy between the information contained on the web site and the information in this paragraph, the web site will govern.)**

- **1.06.09 THE CONTRACTOR MUST NOT PILE OR STORE ANY MATERIALS, MACHINERY OR EQUIPMENT CLOSER THAN 25'-0" TO THE CENTER LINE OF THE NEAREST RAILWAY TRACK. MATERIALS, MACHINERY OR EQUIPMENT MUST NOT BE STORED OR LEFT WITHIN 250 FEET OF ANY HIGHWAY/RAIL AT-GRADE CROSSINGS OR TEMPORARY CONSTRUCTION CROSSING, WHERE STORAGE OF THE SAME WILL OBSTRUCT THE VIEW OF A TRAIN APPROACHING THE CROSSING.**

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PRIOR TO BEGINNING WORK, THE CONTRACTOR MUST ESTABLISH A STORAGE AREA WITH CONCURRENCE OF THE RAILWAY'S PROJECT ENGINEER.

- **1.06.10** Machines or vehicles must not be left unattended with the engine running. Parked machines or equipment must be in gear with brakes set and if equipped with blade, pan or bucket, they must be lowered to the ground. All machinery and equipment left unattended on Railway Property must be left inoperable and secured against movement. (See internet Engineering Contractor Safety Orientation program for more detailed specifications)

- **1.06.11** Workers must not create and leave any conditions at the work site that would interfere with water drainage. Any C&M Work performed over water must meet all Federal, State and Local regulations.

- **1.06.12** All power line wires must be considered dangerous and of high voltage unless informed to the contrary by proper authority. For all power lines the minimum clearance between the lines and any part of the equipment or load must be; 200 KV or below - 15 feet; 200 to 350 KV - 20 feet; 350 to 500 KV - 25 feet; 500 to 750 KV - 35 feet; and 750 to 1000 KV - 45 feet. If capacity of the line is not known, a minimum clearance of 45 feet must be maintained. A person must be designated to observe clearance of the equipment and give a timely warning for all operations where it is difficult for an operator to maintain the desired clearance by visual means.

1.07 Excavation

- **1.07.01** Before excavating, the Contractor must determine whether any underground pipe lines, electric wires, or cables, including fiber optic cable systems are present and located within the C&M Work area. The Contractor must determine whether excavation on Railway Property could cause damage to buried cables resulting in delay to Railway traffic and disruption of service to users. Delays and disruptions to service may cause business interruptions involving loss of revenue and profits. Before commencing excavation, the Contractor must contact Railway's Project Engineer, telephone number (402) 458-7537. All underground and overhead wires will be considered HIGH VOLTAGE and dangerous until verified with the company having ownership of the line. **It is the Contractor's responsibility to notify any other companies that have underground utilities in the area and arrange for the location of all underground utilities before excavating.**

- **1.07.02** The Contractor must cease all work and notify Railway immediately before continuing excavation in the area if obstructions are encountered which do not appear on drawings. If the obstruction is a utility and the owner of the utility can be identified, then the Contractor must also notify the owner immediately. If there is any doubt about the location of underground cables or lines of any kind, no work must be performed until the exact location has been determined. There will be no exceptions to these instructions.

- **1.07.03** All excavations must be conducted in compliance with applicable OSHA regulations and, regardless of depth, must be shored where there is any danger to tracks, structures or personnel.

- **1.07.04** Any excavations, holes or trenches on Railway Property must be covered, guarded and/or protected when not being worked on. When leaving work site areas at night and over weekends, the areas must be secured and left in a condition that will ensure that Railway employees and other personnel who may be working or passing through the area are protected from all hazards. All excavations must be back filled as soon as possible.

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- **1.07.05** Contractor will be responsible at no cost to Railway to locate and make any adjustments necessary to any wire lines, pipe lines, or other utilities, fences, buildings, improvements or other facilities located within Railway Property (collectively, "**Other Improvements**"). Contractor must contact the owner(s) of the Other Improvements notifying them of any work that may damage these Other Improvements and/or interfere with their service and, if required, obtain the owner's written approval prior to so affecting the Other Improvements. Contractor must mark all Railway improvements and Other Improvements on the applicable Approved Plans or other plans and specifications approved in advance by Railway, and mark all Railway improvements and Other Improvements in the field in order to verify their locations. Contractor must also use all reasonable methods when working on or near Railway Property to determine if any Railway improvements or Other Improvements (fiber optic, cable, communication or otherwise) may exist. Failure to mark or identify any Railway improvements or Other Improvements will be sufficient cause for Railway to stop construction at no cost to Railway until such items are completed. Contractor must make all adjustments and other work described in this Section 1.07.05, including without limitation adjustments to Other Improvements and work on and affecting Railway Property, in a manner that does not adversely impact utility service to Railway.

1.08 Hazardous Waste, Substances and Material Reporting

- **1.08.01** If Contractor discovers any hazardous waste, hazardous substance, petroleum or other deleterious material, including but not limited to any non-containerized commodity or material, on or adjacent to Railway Property, in or near any surface water, swamp, wetlands or waterways, while performing any work under this Agreement, Contractor must immediately: (a) notify the Railway's Resource Operations Center at 1 (800) 832-5452, of such discovery: (b) take safeguards necessary to protect its employees, subcontractors, agents and/or third parties: and (c) exercise due care with respect to the release, including the taking of any appropriate measure to minimize the impact of such release.

1.09 Personal Injury Reporting

- **1.09.01** The Railway is required to report certain injuries as a part of compliance with Federal Railroad Administration (FRA) reporting requirements. Any personal injury sustained by an employee of the Contractor, subcontractor or Contractor's invitees while on the Railway Property must be reported immediately (by phone mail if unable to contact in person) to the Railway's Project Engineer. The Non-Employee Personal Injury Data Collection Form contained herein is to be completed and sent by Fax to the Railway at 1 (817) 352-7595 and to the Railway’s Project Engineer no later than the close of shift on the date of the injury.

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NON-EMPLOYEE PERSONAL INJURY DATA COLLECTION

INFORMATION REQUIRED TO BE COLLECTED PURSUANT TO FEDERAL REGULATION. IT SHOULD BE USED FOR COMPLIANCE WITH FEDERAL REGULATIONS ONLY AND IS NOT INTENDED TO PRESUME ACCEPTANCE OF RESPONSIBILITY OR LIABILITY.

1. Accident City/St
2. Date: _____ Time: _____ County:
3. Temperature:
4. Weather
   (if non-Railway location)

5. Social Security #

6. Name (last, first, mi)

7. Address: Street: _____ City: St._____ Zip:

8. Date of Birth: _____ and/or Age _____ Gender:
   (if available)

9. (a) Injury: _____ (b) Body Part:
   (i.e. (a) Laceration (b) Hand)

11. Description of Accident (To include location, action, result, etc.):

12. Treatment:
    __ First Aid Only
    __ Required Medical Treatment
    __ Other Medical Treatment

13. Dr. Name _____ 30. Date: _____

14. Dr. Address:
    Street: _____ City: St: _____ Zip: _____

15. Hospital Name:

16. Hospital Address:
    Street: _____ City: _____ St: _____ Zip: _____

17. Diagnosis:

FAX TO RAILWAY AT (817) 352-7595
AND COPY TO RAILWAY ROADMASTER FAX

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EXHIBIT C-1(A)

CONTRACTOR'S RIGHT OF ENTRY
For C&M Work

BNSF RAILWAY COMPANY
Attention: Project Engineer

Gentlemen:

The undersigned (hereinafter, the "**Contractor**"), has entered into a contract (the "**Contract**") dated _____, 20_ with the City of Lincoln, Nebraska ("**City**") for the performance of certain work ("**C&M Work**") in connection with the construction of entertainment, recreation, lodging, offices, retail and/or other complementary and/or supporting facilities in Lincoln, Nebraska (collectively, the "**West Haymarket Project**"). The work to be performed under this Agreement is deemed to be "City C&M Work" (as defined in that certain Construction and Maintenance Agreement ["**C&M Agreement**"] dated _____, 2010, between BNSF Railway Company and the City). Performance of such C&M Work will necessarily require Contractor to enter BNSF RAILWAY COMPANY ("**Railway**") right of way and property ("**Railway Property**"). The Contract provides that no C&M Work will be commenced within Railway Property until the Contractor employed in connection with said C&M Work for the **City of Lincoln, Nebraska** (i) executes and delivers to Railway an Agreement in the form hereof, and (ii) provides insurance of the coverage and limits specified in such Agreement and Section 3 herein. If this Agreement is executed by a party who is not the Owner, General Partner, President or Vice President of Contractor, Contractor must furnish evidence to Railway certifying that the signatory is empowered to execute this Agreement on behalf of Contractor.

Accordingly, in consideration of Railway granting permission to Contractor to enter upon Railway Property and as an inducement for such entry, Contractor, effective on the date of the Contract, has agreed and does hereby agree with Railway as follows:

Section 1. RELEASE OF LIABILITY AND INDEMNITY

TO THE FULLEST EXTENT PERMITTED BY LAW, CONTRACTOR SHALL RELEASE, INDEMNIFY, DEFEND AND HOLD HARMLESS RAILWAY AND RAILWAY'S AFFILIATED COMPANIES, PARTNERS, SUCCESSORS, ASSIGNS, LEGAL REPRESENTATIVES, OFFICERS, DIRECTORS, SHAREHOLDERS, EMPLOYEES AND AGENTS FOR, FROM AND AGAINST ANY AND ALL CLAIMS, LIABILITIES, FINES, PENALTIES, COSTS, DAMAGES, LOSSES, LIENS, CAUSES OF ACTION, SUITS, DEMANDS, JUDGMENTS AND EXPENSES (INCLUDING, WITHOUT LIMITATION, COURT COSTS AND ATTORNEYS' FEES) OF ANY NATURE, KIND OR DESCRIPTION OF ANY PERSON (INCLUDING, WITHOUT LIMITATION, THE EMPLOYEES OF THE PARTIES HERETO) OR ENTITY DIRECTLY OR INDIRECTLY (COLLECTIVELY, "LIABILITIES") ARISING OUT OF, RESULTING FROM OR CAUSALLY RELATED TO (IN WHOLE OR IN PART):

(i) ANY RIGHTS OR INTERESTS GRANTED TO CONTRACTOR PURSUANT TO THIS AGREEMENT;

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(ii) THE USE, OCCUPANCY OR PRESENCE OF CONTRACTOR AND CONTRACTOR PARTIES (DEFINED BELOW) AND/OR ANY WORK PERFORMED BY CONTRACTOR AND CONTRACTOR PARTIES IN, ON, OR ABOUT RAILWAY'S PROPERTY OR RIGHT-OF-WAY AND/OR THE WEST HAYMARKET PROJECT, INCLUDING, WITHOUT LIMITATION, OPERATION OF THE PEDESTRIAN BRIDGE, SECURITY FENCING, OR STORM WATER MITIGATION BY ANY CONTRACTOR PARTY (DEFINED BELOW);

(iii) ANY ENVIRONMENTAL MATTERS ARISING FROM CONTRACTOR AND/OR CONTRACTOR PARTIES' USE AND OCCUPANCY OF RAILWAY'S RIGHT-OF-WAY OR OTHER RAILWAY PROPERTY, INCLUDING WITHOUT LIMITATION USE AND OCCUPANCY OF RAILWAY'S RIGHT-OF-WAY OR OTHER RAILWAY PROPERTY IN CONNECTION WITH PERFORMANCE OF THE C&M WORK;

(iv) ANY DAMAGE TO OR DESTRUCTION OF ANY TELECOMMUNICATION LINES IN CONNECTION WITH THE WEST HAYMARKET PROJECT BY CONTRACTOR AND/OR CONTRACTOR PARTIES, INCLUDING BUT NOT LIMITED TO (A) ANY INJURY TO OR DEATH OF ANY PERSON EMPLOYED BY OR ON BEHALF OF ANY TELECOMMUNICATIONS COMPANY, AND/OR ITS CONTRACTORS, AGENTS AND/OR EMPLOYEES AS A RESULT OF SUCH DAMAGE OR DESTRUCTION, AND/OR (B) ANY CLAIM OR CAUSE OF ACTION FOR ALLEGED LOSS OF PROFITS OR REVENUE BY, OR LOSS OF SERVICE BY A CUSTOMER OR USER OF SUCH TELECOMMUNICATION COMPANY(IES) AS A RESULT OF SUCH DAMAGE OR DESTRUCTION;

(v) CONTRACTOR'S BREACH OF THE TERMS AND CONDITIONS OF THIS AGREEMENT; OR

(vi) ANY ACT OR OMISSION OF CONTRACTOR OR ITS OFFICERS, AGENTS, INVITEES, EMPLOYEES OR SUBCONTRACTORS (SUCH OFFICERS, AGENTS, INVITEES, EMPLOYEES AND SUBCONTRACTORS BEING REFERRED TO HEREIN INDIVIDUALLY AS A "CONTRACTOR PARTY" AND COLLECTIVELY, "CONTRACTOR PARTIES"), OR ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY ANY OF THEM, OR ANYONE THEY CONTROL OR EXERCISE CONTROL OVER.

THE LIABILITY ASSUMED BY CONTRACTOR WILL NOT BE AFFECTED BY THE FACT, IF IT IS A FACT, THAT ANY DAMAGE, DESTRUCTION, INJURY OR DEATH WAS OCCASIONED BY OR CONTRIBUTED TO BY THE NEGLIGENCE OF RAILWAY, ITS AGENTS, SERVANTS, EMPLOYEES OR OTHERWISE, BUT EXCLUDING CLAIMS WHOLLY CAUSED BY RAILWAY'S SOLE NEGLIGENCE AND EXCLUDING CLAIMS TO THE EXTENT THAT SUCH CLAIMS ARE CAUSED BY THE WILLFUL MISCONDUCT OR GROSS NEGLIGENCE OF RAILWAY.

FURTHER, TO THE FULLEST EXTENT PERMITTED BY LAW, CONTRACTOR AGREES, REGARDLESS OF ANY NEGLIGENCE OR ALLEGED NEGLIGENCE OF RAILWAY, TO INDEMNIFY, DEFEND AND HOLD HARMLESS RAILWAY AGAINST AND ASSUME THE DEFENSE OF ANY LIABILITIES ASSERTED AGAINST OR SUFFERED BY RAILWAY UNDER OR RELATED TO THE FEDERAL EMPLOYERS' LIABILITY ACT ("FELA") WHENEVER EMPLOYEES OF CONTRACTOR OR ANY CONTRACTOR PARTY CLAIM OR ALLEGE THAT THEY ARE EMPLOYEES OF RAILWAY OR OTHERWISE. THIS INDEMNITY SHALL ALSO EXTEND, ON THE SAME BASIS, TO FELA CLAIMS BASED ON ACTUAL OR ALLEGED VIOLATIONS OF ANY FEDERAL, STATE OR LOCAL LAWS OR REGULATIONS, INCLUDING BUT NOT LIMITED TO THE SAFETY APPLIANCE ACT, THE LOCOMOTIVE INSPECTION ACT, THE OCCUPATIONAL SAFETY AND HEALTH ACT, THE RESOURCE CONSERVATION AND RECOVERY ACT, AND ANY SIMILAR STATE OR

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FEDERAL STATUTE.

Contractor further agrees, at its expense, in the name and on behalf of Railway, that it will adjust and settle all Liabilities against Railway, and will, at Railway's discretion, appear and defend any suits or actions of law or in equity brought against Railway on any claim or cause of action arising out of any liability assumed by Contractor under this Agreement for which Railway is liable or is alleged to be liable. Railway will give notice to Contractor, in writing, of the receipt or dependency of such claims and thereupon Contractor must proceed to adjust and handle to a conclusion such claims, and in the event of a suit being brought against Railway, Railway may forward summons and complaint or other process in connection therewith to Contractor, and Contractor, at Railway's discretion, must defend, adjust, or settle such suits and protect, indemnify, and save harmless Railway from and against all Liabilities arising out of any such claims or suits, provided that the foregoing indemnification obligations do not include Liabilities arising wholly out of the sole negligence of Railway or to the extent caused by the gross negligence or willful misconduct of Railway.

In addition to any other provision of this Agreement, in the event that all or any portion of this Article shall be deemed to be inapplicable for any reason, including without limitation as a result of a decision of an applicable court, legislative enactment or regulatory order, the parties agree that this Article shall be interpreted as requiring Contractor to indemnify Railway to the fullest extent permitted by applicable law. **THROUGH THIS AGREEMENT THE PARTIES EXPRESSLY INTEND FOR CONTRACTOR TO INDEMNIFY RAILWAY FOR RAILWAY'S ACTS OF NEGLIGENCE, BUT EXCLUDING CLAIMS WHOLLY CAUSED BY RAILWAY'S SOLE NEGLIGENCE AND EXCLUDING CLAIMS TO THE EXTENT THAT SUCH CLAIMS ARE CAUSED BY THE WILLFUL MISCONDUCT OR GROSS NEGLIGENCE OF RAILWAY.**

It is mutually understood and agreed that the assumption of liabilities and indemnification provided for in this Agreement survive any termination of this Agreement.

Section 2. TERM

This Agreement is effective from the date of the Contract until (i) the completion of the project set forth herein, and (ii) full and complete payment to Railway of any and all sums or other amounts owing and due hereunder.

Section 3. INSURANCE

Contractor must, at its sole cost and expense, procure and maintain during the life of this Agreement the following insurance coverage:

A. Commercial General Liability Insurance. This insurance shall contain broad form contractual liability with a combined single limit of a minimum of $5,000,000.00 per occurrence, and $10,000,000.00 in the aggregate, but in no event less than the amount otherwise carried by the Contractor. Coverage must be purchased on a post 1998 ISO occurrence form or equivalent and include coverage for, but not limited to, the following:

- Bodily Injury and Property Damage
- Personal Injury and Advertising Injury
- Fire legal liability
- Products and completed operations

This policy shall also contain the following endorsements, which shall be indicated on the certificate of insurance:

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- The definition of insured contract shall be amended to remove any exclusion or other limitation for any work being done within 50 feet of railroad property.
- Waiver of subrogation in favor of and acceptable to Railroad.
- Additional insured endorsement in favor of and acceptable to Railroad.
- Separation of insureds.
- The policy shall be primary and non-contributing with respect to any insurance carried by Railroad.

It is agreed that the workers' compensation and employers' liability related exclusions in the Commercial General Liability insurance policy(s) required herein are intended to apply to employees of the policy holder and shall not apply to Railroad employees.

No other endorsements limiting coverage as respects obligations under this Agreement may be included on the policy with regard to the work being performed under this Agreement.

B. Business Automobile Insurance. This insurance shall contain a combined single limit of at least $1,000,000 per occurrence, and include coverage for, but not limited to the following:

- Bodily injury and property damage
- Any and all vehicles owned, used or hired

This policy shall also contain the following endorsements or language, which shall be indicated on the certificate of insurance:

- Waiver of subrogation in favor of and acceptable to Railroad.
- Additional insured endorsement in favor or and acceptable to Railroad.
- Separation of insureds.
- The policy shall be primary and non-contributing with respect to any insurance carried by Railroad.

C. Workers Compensation and Employers Liability Insurance. This insurance shall include coverage for, but not limited to:

- Contractor's statutory liability under the worker's compensation laws of the state(s) in which the work is to be performed. If optional under State law, the insurance must cover all employees anyway.
- Employers' Liability (Part B) with limits of at least $500,000 each accident, $500,000 by disease policy limit, $500,000 by disease each employee.

This policy shall also contain the following endorsements or language, which shall be indicated on the certificate of insurance:

- Waiver of subrogation in favor of and acceptable to Railroad.

D. Railroad Protective Liability Insurance. This insurance shall name only the Railroad as the Insured with coverage of at least $5,000,000 per occurrence and $10,000,000 in the aggregate. The policy shall be issued on a standard ISO form CG 00 35 10 93 and include the following:

- Endorsed to include the Pollution Exclusion Amendment (ISO form CG 28 31 10 93)
- Endorsed to include the Limited Seepage and Pollution Endorsement.
- Endorsed to remove any exclusion for punitive damages.
- No other endorsements restricting coverage may be added.

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- The original policy must be provided to Railroad prior to performing any work or services under this Agreement

In lieu of providing a Railroad Protective Liability Policy, Contractor may participate in BNSF's Blanket Railroad Protective Liability Insurance Policy available to Contractor.

Other Requirements:

All policies (applying to coverage listed above) must not contain an exclusion for punitive damages and certificates of insurance must reflect that no exclusion exists.

Contractor agrees to waive its right of recovery against Railroad for all claims and suits against Railroad, except for claims and suits arising wholly out of the sole negligence, or to the extent caused by the gross negligence or willful misconduct, of Railroad. In addition, its insurers, through the terms of the policy or policy endorsement, waive their right of subrogation against Railroad for all claims and suits, except for claims and suits arising wholly out of the sole negligence, or to the extent caused by the gross negligence of willful misconduct, of Railroad. The certificate of insurance must reflect the waiver of subrogation endorsement. Contractor further waives its right of recovery, and its insurers also waive their right of subrogation against Railroad for loss of its owned or leased property or property under Contractor's care, custody or control, except for the right of recovery or right of subrogation arising wholly out of the sole negligence, or to the extent caused by the gross negligence or willful misconduct, of Railroad.

Contractor is not allowed to self-insure without the prior written consent of Railroad. If granted by Railroad, any deductible, self-insured retention or other financial responsibility for claims must be covered directly by Contractor in lieu of insurance. Any and all Railroad liabilities that would otherwise, in accordance with the provisions of this Agreement, be covered by Contractor's insurance will be covered as if Contractor elected not to include a deductible, self-insured retention or other financial responsibility for claims.

Prior to commencing the C&M Work, Contractor must furnish to Railroad acceptable certificate(s) of insurance including an original signature of the authorized representative evidencing the required coverage, endorsements, and amendments. The policy(ies) must contain a provision that obligates the insurance company(ies) issuing such policy(ies) to notify Railroad in writing at least 30 days prior to any cancellation, non-renewal, substitution or material alteration. This cancellation provision must be indicated on the certificate of insurance. Upon request from Railroad, a certified duplicate original of any required policy must be furnished. Certificate(s) should be sent to the following address:

Ebix BPO
PO Box 12010-BN
Hemet, CA 92546-8010
Fax number: 951-652-2882
Email: bnsf@ebix.com

Any insurance policy must be written by a reputable insurance company reasonably acceptable to Railroad or with a current Best's Guide Rating of A- and Class VII or better, and authorized to do business in the state(s) in which the service is to be provided.

Contractor represents that this Agreement has been thoroughly reviewed by Contractor's insurance agent(s)/broker(s), who have been instructed by Contractor to procure the insurance coverage required by this Agreement. Allocated Loss Expense must be in addition to all policy limits for coverages referenced above.

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Not more frequently than once every five years, Railroad may reasonably modify the required insurance coverage to reflect then-current risk management practices in the railroad industry and underwriting practices in the insurance industry.

If any portion of the operation is to be subcontracted by Contractor, Contractor must require that its subcontractors provide and maintain the insurance coverages set forth herein, naming Railroad as an additional insured, and requiring that the subcontractors release, defend and indemnify Railroad to the same extent and under the same terms and conditions as Contractor is required to release, defend and indemnify Railroad herein.

Failure to provide evidence as required by this section will entitle, but not require, Railroad to immediately suspend work under this Agreement until such evidence is provided. Acceptance of a certificate that does not comply with this section will not operate as a waiver of Contractor's obligations hereunder.

The fact that insurance (including, without limitation, self-insurance) is obtained by Contractor will not be deemed to release or diminish the liability of Contractor including, without limitation, liability under the indemnity provisions of this Agreement. Damages recoverable by Railroad will not be limited by the amount of the required insurance coverage.

For purposes of this section, Railroad means "Burlington Northern Santa Fe, LLC", "BNSF Railway Company" and the subsidiaries, successors, assigns and affiliates of each.

Section 4. EXHIBIT C CONTRACTOR REQUIREMENTS

The Contractor must observe and comply with all provisions, obligations, requirements and limitations contained in the Contract, and the Contractor Requirements set forth on Exhibit C attached to this Agreement and the Contract, including, but not be limited to, payment of all costs incurred for any damages to Railway roadbed, tracks, and/or appurtenances thereto, resulting from use, occupancy, or presence of its employees, representatives, or agents or subcontractors on or about the construction site.

Section 5. TRAIN DELAY

Contractor is responsible for and hereby indemnifies and holds harmless Railway (including its affiliated railway companies, and its tenants) for, from and against all damages arising from any unscheduled delay to a freight or passenger train which affects Railway's ability to fully utilize its equipment and to meet customer service and contract obligations. Contractor will be billed, as further provided below, for the economic losses arising from loss of use of equipment, contractual loss of incentive pay and bonuses and contractual penalties resulting from train delays, whether caused by Contractor, or subcontractors, or by the Railway performing work under this Agreement. Railway agrees that it will not perform any act to unnecessarily cause train delay.

For loss of use of equipment, Contractor will be billed the current freight train hour rate per train as determined from Railway's records. Any disruption to train traffic may cause delays to multiple trains at the same time for the same period.

Additionally, the parties acknowledge that passenger, U.S. mail trains and certain other grain, intermodal, coal and freight trains operate under incentive/penalty contracts between Railway and its customer(s). Under these arrangements, if Railway does not meet its contract service commitments, Railway may suffer loss of performance or incentive pay and/or be

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subject to penalty payments. Contractor is responsible for any train performance and incentive penalties or other contractual economic losses actually incurred by Railway which are attributable to a train delay caused by Contractor or its subcontractors.

The contractual relationship between Railway and its customers is proprietary and confidential. In the event of a train delay covered by this Agreement, Railway will share information relevant to any train delay to the extent consistent with Railway confidentiality obligations. Damages for train delay are currently $382.20 per hour per incident. **THE RATE THEN IN EFFECT AT THE TIME OF PERFORMANCE BY THE CONTRACTOR HEREUNDER WILL BE USED TO CALCULATE THE ACTUAL COSTS OF TRAIN DELAY PURSUANT TO THIS AGREEMENT.**

Contractor and its subcontractors must give Railway's Project Engineer (402) 458-7537 thirty (30) days' minimum advance notice of the times and dates for proposed work windows. Railway and Contractor will establish mutually agreeable work windows for the project. Railway has the right at any time to revise or change the work windows due to train operations or service obligations. Railway will not be responsible for any additional costs or expenses resulting from a change in work windows. Additional costs or expenses resulting from a change in work windows shall be accounted for in Contractor's expenses for the project.

Contractor and subcontractors must plan, schedule, coordinate and conduct all Contractor's work so as to not cause any delays to any trains.

[Signature page follows]

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Kindly acknowledge receipt of this letter by signing and returning to the Railway two original copies of this letter, which, upon execution by Railway, will constitute an Agreement between us.

_____ (**Contractor**)	**BNSF Railway Company**
By:_____ Printed Name: _____ Title:_____	By:_____ Name:_____ *Project Engineer*

Contact Person: _____ Accepted and effective this _____day of 20__.
Address: _____
_____
City:_____ State:___ Zip:____
Fax: _____
Phone: _____
E-mail:_____

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ADDITIONAL SPECIFICATION SECTIONS

The following Chapters 5, 11 and 12 of the City of Lincoln Standard Specifications for Municipal Construction are attached and shall be considered a part of these project Special Provisions. The West Haymarket Environmental Contingency Plan, the West Haymarket Geotechnical Reports, the North 48th Street Site Plan, SWPPP and grading plan, and Existing Sanitary Sewer Flow Data are also attached and shall be considered a part of these Special Provisions. The BNSF Accommodation of Utilities Policy, and the BNSF Requirements for Shoring are attached by reference to these contract documents.

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ASPHALTIC CONCRETE CONSTRUCTION

5.00 GENERAL

Asphaltic concrete mixtures required for surface courses, base courses, overlays, wedge courses, and patching shall be placed as hereinafter specified. Asphaltic concrete shall be bid and paid for by the ton as defined in these specifications.

Patching shall be defined as pavement replacement of areas requiring small quantities of asphaltic concrete per placement such as utility crossings and repair, returns to existing streets, or larger quantity placements such as longitudinal cuts for utility work not requiring curb to curb asphalt replacement, temporary pavement, and for other similar situations as directed by the Engineer.

5.01 RELATED ITEMS SPECIFIED ELSEWHERE

Asphaltic Concrete Special Provision

5.02 MATERIALS

A. ASPHALTIC CONCRETE MIXTURES

Asphaltic Concrete shall be an approved mix as shown on the Plans or in the Contract Special Provisions and as defined in Chapter 12 of these Specifications.

B. NON-WOVEN PAVEMENT OVERLAY FABRIC

Non-woven overlay fabric shall be needle punched, polypropylene fabric conforming to the following requirements:

PROPERTY	TYPICAL	MINIMUM
Mass, g/m^2	145	129
Tensile Strength, newton (N)	512	400
Elongation at Break, %	60	55
Mullen Burst Strength, kPa	1515	1375
Asphalt Retention, L/m^2	----	0.90

Acceptance shall be based upon manufacturer's certification of conformity.

5.03 EQUIPMENT

All equipment, tools and machinery shall be adequate for the purpose for which it is to be used, and shall be maintained in satisfactory working condition at all times. The equipment shall be at the Work site sufficiently in advance of construction operations to be thoroughly examined and approved by the Engineer. The Contractor shall furnish the necessary accessories, equipment data, and assistance required by the Engineer for making tests and calibrations on equipment.

A. DISTRIBUTORS

Whenever the use of a distributor is required, that piece of equipment shall be manufactured expressly for the purpose of applying heated asphaltic materials by pressure spray applications. Improvised equipment, such as converted road oilers, will not be acceptable. The distributor shall be so designed as to permit the application of heated asphaltic material in a uniform spray without atomization at the rate, temperature, and pressure required. The distributor shall be equipped with a tachometer registering revolutions per minute and so located as to be visible to the driver in order that the driver may maintain the constant speed required for the specified rate of application. The distributor shall be mounted on a motor truck or trailer, equipped with pneumatic tires. The pump shall be equipped with a meter registering the number of gallons (liters) per minute passing through the nozzle and this meter must be visible to the operator. The distributor shall be equipped with an accurate thermometer which indicates the temperature of the asphaltic materials at all times. The distributor shall be equipped with a full-circulating spray bar and shall be provided with hand-nozzles to permit application to areas not accessible to the spray bar. The distributor shall be equipped with a drip tray or other suitable means of preventing the dripping of material after the flow has been shut off.

B. ASPHALT SPREADER AND FINISHER

The mechanical asphalt spreader and finisher shall be self-propelled and shall be designed and equipped to spread upon the prepared surface without segregation of the mixture, a tamped and finished wearing surface of asphaltic concrete free from hollows and humps.

The machine shall be equipped with a hopper to receive the asphaltic concrete as it is dumped from the trucks and shall be designed so as to prevent the mixture from being deposited directly on the base or previously laid courses. The hopper shall have a suitable device to distribute the mix evenly across the full width of the screed. The machine shall be equipped with means of adjusting the thickness of the mat, and the transverse and longitudinal grade. It shall be equipped with a tamping or vibrating screed which shall be operated during the lay-down process to compact the applied material to a uniform density. No part of the machine shall travel on the freshly laid material. There shall be auxiliary attachments for the machine so it shall be operated to lay widths as approved by the Engineer.

C. ROLLERS

The number of rollers furnished shall be not less than two independent units, one being a steel wheeled roller and the other a pneumatic tire roller. In lieu of two rollers, one may be used if it is a vibratory roller with one set of pneumatic tires and with separate controls for energy and propulsion, which produces the specified density and a satisfactory surface.

Wheels of all rollers shall be smooth and free from openings or projections which would mar the surface of the Work. They shall be equipped with suitable devices necessary to prevent adhesion of bituminous material to the tires and wheels. The rollers shall be equipped with water tanks for wheel sprinkling devices that extend the full width of each roller, and drip pans designed so as to prevent oil, grease, gas or diesel oil from spilling or dripping onto the asphaltic concrete surface.

D. SURFACE PLANER

The planing machine shall be self-propelled, of sufficient weight, size, power and traction to remove surface irregularities without tearing or displacing of the remaining asphaltic surface or concrete pavement. The cutting edge or drum shall be designed and constructed to permit adjustment to match the existing roadway crown. The machine shall be so designed to permit operation against all curbs, catch basins, inlets and other appurtenances within the Work area. The minimum grinding or planing width of the machines shall be 30 inches. Alternate equipment will not be acceptable without prior written approval of the Engineer.

E. TRUCKS

Numbered trucks having tight, clean, smooth beds shall be used for transporting the freshly prepared asphaltic concrete to the site of the Work. The beds shall be sprayed, when necessary, to prevent the asphaltic concrete mixture from adhering to the bed, with a minimum quantity of approved lubricant. The equipment used and the frequency of spraying shall be determined by the Engineer.

All trucks shall be equipped with a suitable waterproof canvas cover to protect the material as required by the Engineer. Any truck that causes excessive segregation of materials by the action of its spring suspension or other contributing factors, or that causes undue delays, shall not be used for transporting the asphaltic concrete mixtures. All truck beds shall be so constructed that they may be insulated, when necessary. All truck boxes shall be equipped with box vibrators.

5.04 PREPARATION OF EXISTING SURFACE

A. CLEANING

Prior to the application of asphaltic materials on existing base, the surface on which the asphalt is to be placed shall be thoroughly cleaned by means of mechanical sweepers, street flushers, shovels, scrapers, and hand brooms as is necessary to remove all mud, matted earth, dust and other foreign materials. Power brooming shall be conducted in such a manner as to keep dust and debris under control and cause a minimum of disturbance to surrounding areas. Material cleaned from the surface shall be removed and disposed of by the Contractor.

The cost of cleaning the existing surfaces to which asphalt is to be applied shall be considered subsidiary to other items for which payment is made.

B. SURFACE PLANING

Surface planing shall consist of grinding or planing of existing asphaltic or concrete pavements to remove any surface irregularities to within a predetermined specified limit, in accordance with the requirements of these Specifications, at locations shown in the plans, or as directed by the Engineer.

Unless the total street width is to be planed, prior to beginning the operation the Engineer shall indicate all individual areas to be planed. These areas shall be rectilinear, except where existing obstructions prohibit this shape.

Surface planing shall be accomplished without gouging or tearing of the remaining pavement surface. The Contractor shall make as many passes with the planing machine as necessary to remove the surface. Surface planing shall include the grinding of all dissimilar material.

The interface between the surface planed area and the concrete gutter pan shall be cleaned of all old asphalt and maintained to provide a smooth, straight, and vertical surface.

Following the final pass, the planed surface shall be within a tolerance of 1/4 inch when checked with a 10 foot straightedge.

The Contractor shall be responsible for location and protection of all manholes, valve boxes, and all other appurtenances, some of which may be below the surface of the street, and to protect equipment from the danger of striking same. Claims for any and all damages arising from hitting these appurtenances shall be the Contractor’s responsibility. The Contractor shall have access to applicable records; however, the Contractor shall not rely upon these records to reveal all such hidden appurtenances.

The Contractor shall be held responsible for all appurtenances in the pavement surface which have been damaged or disturbed by the Contractor. The cost of repairing or replacing these damaged appurtenances shall be made at the Contractor's expense.

The Contractor shall remove all pavement cuttings which result from the performance of this Work and deliver them to locations approved by the Engineer.

BASIS OF PAYMENT

When called for in the proposal, the cost of operating the surface planer and the cost of collecting and hauling the pavement cuttings shall be paid for at the contract unit price per hour for each piece of equipment during the time that it is in use. Cleaning required subsequent to the initial removal of the cuttings shall be as provided in Paragraph A above.

When called for in the proposal, SURFACE PLANING, completed in conformance with the plans and Specifications and accepted by the Engineer, shall be measured and paid for at the contract unit price bid per square yard. Such payment shall be full compensation for all surface preparation, planing, removal of materials, labor, tools, equipment, clean up and incidentals necessary to complete the Work.

C. CORRECTION OF PAVEMENT FAILURES

After the surface planing and cleaning have been accomplished, the Engineer shall examine the pavement structure to which the asphaltic concrete is to be applied. Any pavement failures shall be repaired as designated by the Engineer.

BASIS OF PAYMENT

The cost of repairing pavement failures shall be measured and paid for at the appropriate unit prices or shall be accomplished as an Extra Work Item.

D. TACKING

This Work shall consist of the application of asphaltic materials to previously prepared bases or existing surfaces.

After the surface is completely cleaned and dry it shall have a tack coat of rapid curing cut-back asphalt or emulsified asphalt applied sufficiently in advance of the laying operation to break or cure prior to the application of the surface coat.

Traffic shall not be permitted on the tack coat without the permission of the Engineer, and the asphalt surface course shall be applied as soon as the tack breaks and the water has evaporated. The rate of application generally should be from 0.05 to 0.2 gallons per square yard, with the rate of application to be approved by the Engineer. Tack or asphaltic cement shall be applied by hand to all vertical edges.

The cost of supplying and applying tack coat will not be measured for payment. It shall be considered subsidiary for other items to which direct payment is made.

E. NON-WOVEN PAVEMENT OVERLAY FABRIC

Non-woven pavement overlay fabric and asphaltic cement sealant shall be placed at locations called for on the plans. This Work shall consist of the application of an asphalt sealant and the placement of a non-woven pavement overlay fabric over the entire prepared surface of the pavement to be surfaced or resurfaced with asphalt. Sealants are applied both to seal the existing surface and to provide a cement to adhere to the fabric. Emulsified asphalts are not acceptable for sealant.

Sealant and fabric shall be placed only when the ambient air temperature is 50°F or above. The pavement surface on which the sealant fabric is to be placed shall be dry and free of dirt, debris and other foreign matter. Joint and crack openings of 1/8 inch and larger shall be filled with a suitable material as directed by the Engineer. The asphalt sealant shall be applied with distributor equipment at a rate of 0.25 to 0.30 gallons per square yard. The width of the asphalt sealant application shall be the fabric width plus 2 to 6 inches or the entire width of the pavement to be surfaced.

Temperature of the sealant shall be not less than 280°F at the time of application to ensure a uniform spray pattern.

No drilling or skipping shall be permitted. Asphalt drools or spills shall be cleaned from the pavement surface to avoid flushing and possible fabric movement at these asphalt rich areas. Fabric lay-down equipment shall be used for placement of the fabric. Overlap of fabric joints shall be 1 to 3 inches.

Immediately after the placement, the fabric shall be embedded into the asphalt cement sealant with a pneumatic roller, unless otherwise directed by the Engineer. The construction of the asphaltic concrete overlay shall follow closely the placement of the fabric. In the event the sealant bleeds through the fabric before the overlay is placed, the Contractor shall be required to spread a thin layer of sand or asphaltic concrete over the affected areas in order to prevent the fabric from being picked up by the construction equipment. The application of tack coat will not be required on the fabric prior to the placement of the asphaltic concrete unless a delay in the placement of the overlay results in the fabric becoming dry or dirty.

5.05 HAULING AND SPREADING ASPHALTIC CONCRETE MIXTURES

A. HAULING

Clean trucks fully fueled shall be weighed in the morning when starting up and then again in the early afternoon to obtain accurate tare weights. The Engineer may also require re-weighing at any time to obtain new tare weights.

B. SPREADING

Asphaltic concrete used in the construction of sections having a uniform width as shown in the typical cross section of the plans, shall be spread and finished with an approved mechanical spreading and finishing machine. The operation of placing mixtures shall be continuous, as nearly as possible.

The asphaltic concrete mixture shall be dumped in the center of the hopper of the spreading machine. Care shall be exercised to avoid overloading and slopping over of the mixture on the base, pavement, or previously laid asphaltic concrete. The operating speed and depth of strike-off of the spreading and finishing machine shall be regulated so as to produce a well knit, uniform layer of the required compacted thickness.

The asphaltic concrete mixture shall be laid only upon a surface which is dry and free from frost.

When the asphaltic concrete mixture is placed in irregular or narrow sections, intersections, or other areas where it is impractical to spread and finish the mixture by methods previously specified, the Contractor may use other equipment or acceptable hand methods for spreading the mixtures, as approved by the Engineer.

The cost of hauling and spreading the asphaltic concrete mixture shall be considered subsidiary to other items for which payment is made.

5.06 COMPACTING AND FINISHING ASPHALTIC CONCRETE MIXTURES

A. ROLLING

Immediately after spreading, the mixture shall be compacted thoroughly by rolling. The number, weight, types of rollers, sequence of rolling operations and compaction procedures shall be such that the required density and a satisfactory surface are attained consistently while the mixture is in a workable condition.

The initial rolling shall begin as soon as the material will bear the weight of the roller without displacing the material. The final compaction and finishing shall be performed by rollers while the material is still warm and responds to the action of the roller. Rolling shall not be carried on in such a manner or at such a time as will cause shoving or cracking. No additional rolling or compaction will be allowed after the asphalt has cooled beyond 150° F (121° C).

The asphaltic concrete shall be compacted such that the completed surface is slightly above the surface of the concrete at the gutter pan joint and shall be smooth, true and conform to the grade, cross section and contour required without any irregularities that exceed 1/8 inch when tested with a 10 foot straightedge.

All areas not accessible to the equipment specified shall be compacted and finished by other equipment and methods that will provide a satisfactory surface and the specified density. Any areas determined by the Engineer to be defective, shall be immediately reworked to the satisfaction of the Engineer.

B. JOINTING

Longitudinal and transverse joints shall be made in such a manner that well bonded and sealed joints are achieved. Joints between old and new pavement shall be made in such a manner as to insure a thorough and continuous bond between the old and new surface

Cold joints shall be painted with a light application of asphalt cement before the adjacent material is placed. When placing surface course, a hot joint between lane placement shall be maintained as directed by the Engineer.

Joints in the surface course shall be formed by any approved method that will produce a dense vertical joint; otherwise the previously laid surface course shall be cut back to its full depth so as to expose a fresh surface, after which the hot mixture shall be placed in contact with it and raked to proper depth and grade.

No measurement or direct payment shall be made for the operations of rolling and jointing asphaltic concrete pavement. The cost thereof shall be considered subsidiary to other items for which direct payment is made.

C. DENSITY AND DENSITY SAMPLES

1. General

During the construction of asphaltic concrete pavement, the Contractor shall obtain core samples from each pavement lift for the determination of density. These samples shall be taken not later than seven (7) days after the date of placement of the asphaltic concrete at locations designated by the Engineer and shall be delivered to the Owner's Testing Lab or given to the Project Observer immediately after removal from the pavement. The samples shall be taken by drilling with a minimum 4 inch diameter core drill. After removal from the pavement, the cores shall not be sawed, trimmed, or modified by the Contractor in any way so that the actual lift thickness may be determined by the Engineer. The surfaces from which the samples have been taken shall be restored by the Contractor with hot asphaltic concrete mixture on the next succeeding date of plant operation but not later than seven (7) days after placement. Density samples shall be tested in accordance with the Nebraska Standard Method of Tests for specific gravity of compressed bituminous mixtures, NDR T 166. The void-less density for each lot sample shall be tested in accordance with the Nebraska Standard method of test for Maximum Specific Gravity of Bituminous Paving Mixtures, NDR T 209.

A minimum of one sample shall be required for each lot of asphaltic concrete. A lot is defined as each 500 tons or fraction thereof of each day's production. The location of each of the required samples shall be determined by the Engineer. The % of Payment for each lot of asphaltic concrete shall be in accordance with Table "A" of this Section. The % of Payment in Table "A" shall be reduced by 5% for any lot represented by initial density samples received by the Owner's Testing Lab more than (7) days from date of placement.

2. Arterial Streets

The asphaltic concrete for arterial streets shall be compacted to a density of not less than ninety-two and one half percent (92.5%) of the void-less density for that mixture. If any density test result indicates a compaction value of less than ninety-two and one half percent (92.5%) of the void-less density, two additional check cores will be obtained from that lot by the Contractor at points designated by the Engineer not later than 14 days after date of placement and delivered to the Owner's Testing Lab or given to the Project Observer immediately after removal from the pavement as described above. The % of Payment in Table "A" shall be reduced by 5% for any lot represented by check cores received more than (14) days from date of placement. The average density of the three samples shall be considered the density of the lot. In the event a sample is obviously damaged, an alternate sample will be obtained within 3 feet of the location of the damaged sample.

Reduction in payment for each lot of asphaltic concrete will be made according to the following table:

TABLE 'A'

Average Density	Min. # Samples	% of Payment
92.5 and above	1	100
92.0 to 92.4	3	95

91.5 to 91.9	3	90
91.0 to 91.4	3	85
90.5 to 90.9	3	80
90.0 to 90.4	3	70
89.9 or less	3	40 or reject

Where removal is required, no payment will be made for the asphalt concrete surfacing ordered removed or the cost associated with the removal thereof.

The thickness of the samples shall be the average of four measurements made at four equally spaced locations on the perimeter of the sample. When the nominal layer thickness is either less than 1 inch or less than one and a half times the nominal maximum size of the aggregate contained in the asphaltic concrete mixture, the sampling and testing of density for this layer shall be waived. When the nominal thickness of a layer is greater than 1 inch and also equal to or greater than one and a half times the nominal maximum size of aggregate contained in the asphaltic concrete mixture, the thickness of the density sample or samples shall also equal or exceed these thickness requirements. Density determinations shall be waived for any lot when the maximum thickness requirements are not met by any of three samples taken at random.

3. Non Arterial Streets and Parking Areas

The general requirement for Density and Density Samples shall be the same as that for Arterial Streets.

Where removal is required, no payment will be made for the asphalt concrete surfacing ordered removed or the cost associated with the removal thereof.

No measurement or direct payment shall be made for obtaining core samples for the determination of the density pay factor and layer thickness and restoring the surface. Obtaining core samples and restoring the surface shall be considered subsidiary to the items for which direct payment is provided.

D. ASPHALTIC CONCRETE CURB

When called for on the plans, asphaltic concrete curb shall be constructed of a mix approved by the Engineer, or as shown on the plans. The asphaltic concrete shall conform to the shape and dimensions that are shown on the plans.

Whenever possible the asphaltic concrete curb shall be shaped and compacted with a curb machine capable of constructing the curb true to line, grade, and cross section and to a density and with a surface texture which is satisfactory to the Engineer.

Special precautions shall be taken to provide a proper bond between the surface course and the curb. The surface shall be thoroughly cleaned and tacked with hot asphalt cement. If performed during cool weather, surface course shall be heated so that it is sufficiently plastic to form a bond with the hot asphaltic concrete curb.

E. COLD WEATHER PLACEMENT

When weather conditions are expected to adversely affect the temperature of the Asphaltic Concrete during placement and compaction, all haul trucks shall be covered and insulated as directed by the Engineer.

The temperature of the Asphaltic Concrete during placement shall be such that compaction is accomplished within the temperature range as specified by the Asphalt Binder supplier for the grade of binder being used.

Asphaltic Concrete shall not be placed when the ambient temperature during placement is expected to fall below 35°F, without permission from the Engineer.

Asphaltic concrete shall not be placed on frozen or frost covered subgrade or base. Table 'B' shall be used by the Engineer to restrict the routine placement of asphaltic concrete as a result of cold temperatures. Wind velocity, cloud cover, and other project specific conditions will be considered by the Engineer if deviating from Table 'B'.

TABLE 'B'

Lift Thickness	Minimum Surface Temperature
Less than 2 inches	45°F
2 to 3 inches	37°F
Greater than 3 inches	35°F

5.07 BASIS OF PAYMENT

A. NON-WOVEN PAVEMENT OVERLAY FABRIC

Placement of the non-woven pavement overlay fabric shall be measured and paid for at the contract unit price bid per square yard for the item NON-WOVEN PAVEMENT OVERLAY FABRIC. Such payment shall be full compensation for cleaning and preparing the pavement surface, filling joint and crack openings; for furnishing, heating, and applying the asphalt sealant; for placement and rolling of the fabric; for furnishing and applying material for blotting the surface of the fabric as required; and for all equipment, labor, tools, and incidentals required to complete the Work.

B. ASPHALTIC CONCRETE SURFACE COURSE

The asphaltic concrete surface course used in construction of new pavements, wedge course, or overlay, constructed in conformance with these Special Provisions and accepted by the Engineer, shall be measured and paid for on a lot basis at the

appropriate contract unit price bid per ton for the pay item “Asphaltic Concrete Surface Course, Type __”. The amount of asphaltic concrete to be paid for shall be the net weight of the material actually incorporated into the work and shall be subject to the requirements of Section 5.06.C of these Special Provisions. Such payment shall be full compensation for all material, binder, labor, equipment, tools, mixing, hauling, tack coats, spreading, compacting to required density, and incidentals necessary to construct the asphaltic concrete surface course to the thickness designated on the plan or as directed by the Engineer.

CHAPTER 11

PORTLAND CEMENT CONCRETE

11.00 GENERAL

Portland Cement Concrete (PCC) shall consist of an intimate mixture of Portland Cement, aggregate, water and an air-entraining admixture. Portland Cement used in all concrete mixtures except L-5500 and PR shall be modified with Class F Fly Ash as described below and as indicated in Table 11.02. Depending on the application, other constituents or admixtures may be used with permission from the Engineer. Materials not on the latest edition of the Nebraska Department of Roads (NDOR) "Approved Products List" shall not be used without permission from the Engineer. The constituents of Portland Cement Concrete and their mixing, handling, and proportioning shall conform to ASTM Designation C 94 except as modified herein.

11.01 MATERIALS

A. CEMENT

Portland Cement shall be a recognized standard hydraulic cement composed primarily of hydraulic calcium silicates conforming to the requirements of ASTM Designation C 150 for Type I, II, or III cement and shall contain no more than 0.60 percent equivalent alkali. Equivalent alkali is defined as the sum of the sodium oxide (Na_2O) and the potassium oxide (K_2O) calculated as sodium oxide (equivalent alkali as $Na_2O = Na_2O + 0.658(K_2O)$). Certified mill tests shall be furnished to the Engineer. Different brands of cement, or the same brand from different mills, shall not be mixed during storage. Neither shall they be used alternately in any one concrete placement without permission from the Engineer. Contractors or Subcontractors supplying concrete shall notify the Engineer when changing to different cement.

The cement shall be protected from damage due to moisture. Cement so damaged will be rejected. Cement shall not be in storage at the concrete plant longer than ninety (90) days without retesting. The temperature of the cement when used shall be less than 180°F.

B. FLY ASH MODIFIED PORTLAND CEMENT CONCRETE (PCC)

Portland Cement Concrete (PCC) mixes for pavement, driveways, curb, median, and sidewalk shall be modified by the use of Type IPF cement, as specified below. Type IPF cement shall be Portland cement which is pre-blended or inter-ground by the cement manufacturer with 25 +/- 2 percent Class F fly ash and shall conform to the requirements of ASTM C 595. No additional fly ash may be added at the concrete plant.

B. FLY ASH MODIFIED PORTLAND CEMENT CONCRETE (PCC) (Continued)

An NDOR approved water-reducing admixture shall be used in all fly ash modified concrete mixes at the dosage rate recommended by the manufacturer. The water-cement ratio of all fly ash modified concrete shall not exceed the maximum limit for the various classes of concrete as shown in Table 11.02.

Fly ash shall conform to the requirements of Class F pozzolan of ASTM Designation C 618, except that the maximum loss on ignition for Class F pozzolan shall be six percent (6.0%). Additionally, Class F pozzolans shall have a maximum allowable free carbon content not to exceed three percent (3.0%). Class F fly ash shall not contain more than one and five-tenths percent (1.50%) of available alkalies as Na_2O. Fly ash such as is produced in furnace operations utilizing liming materials or soda ash (sodium carbonate) as an additive will not be acceptable. Certified mill tests shall be provided to the Engineer.

Only brands of Type IPF Cement which are on the latest edition of the Nebraska Department of Roads Approved Products List shall be approved for use in concrete in City of Lincoln projects.

Type IPF cement shall not be used in mix designations LB-2750, LB-3500, L-5500 and PR without permission from the Engineer.

TABLE 11.02 - PORTLAND CEMENT CONCRETE MIXTURES (CUBIC YARD BATCH)

CLASS OF CONCRETE (1)	GENERAL USE	CEMENT (lb/cy)	CEMENT TYPE (2)	WATER CEMENT RATIO (MAX.)	SLUMP (MAX.) (inches) (3)	AGGREGATES (% BY WEIGHT)		AIR CONTENT RANGE (% BY VOLUME)	28 DAY STRENGTH MIN. PSI
						FINE	COARSE		
SG-3000	Where Specified	564	1PF	0.50	4.0	100	0	6.0 - 8.5	3000
L-3500	Pavement, Sidewalk, Structures	564	1PF	0.50	4.0	70 +/- 3	30 +/- 3	6.0 - 8.5	3500
L-3500S	Slip-form Pavement	564	1PF	0.48	2.5	70 +/- 3	30 +/- 3	7.0 - 10.0	3500
LC-3500	Machine Curb	564	1PF	0.48	2.5	70 +/- 3	30 +/- 3	6.0 - 8.5	3500
L-4500	Structures	658	1PF	0.42	4.0	70 +/- 3	30 +/- 3	6.0 - 8.5	4000
LB-2750	Pavement Base (New Construction Residential)	423	I/II	0.60	4.0	60 +/- 2	40 +/- 2	5.5 - 7.5	2750
LB-3500	Pavement Base (Reconstruction)	564	I/II	0.50	4.0	70 +/- 3	30 +/- 3	5.5 - 7.5	3500
L-5500	Pavement (High/Early Strength)	752	I/II	0.40	4.0	70 +/- 3	30 +/- 3	6.0 - 8.5	4000
PR (4)	Pavement Repair (High/Early Strength)	799	III	0.45	4.0	70 +/- 3	30 +/- 3	6.0 - 8.5	4000

NOTES:
(1) All mixtures shall contain a NDOR approved water reducer at the manufacturer's recommended dosage rate.
(2) For Temporary Pavement, Type I/II cement is allowed.
(3) The maximum slump may be exceeded by use of water reducer, high range water reducer, or both.
(4) Calcium Chloride may be added as per NDOR Standard Specifications for Highway Construction.
This table is for proportion ranges only. Actual mix design weights for specific applications will be provided by the City of Lincoln Materials Testing Laboratory.

CITY OF LINCOLN, NEBRASKA, STANDARD SPECIFICATIONS

CHAPTER 12

ASPHALTIC CONCRETE

ARTICLE	TITLE
12.00	General
12.01	Related Items Specified Elsewhere
12.02	Materials A. Asphalt Binder B. Tack Coats C. Mineral Aggregates
12.03	Asphaltic Concrete Mixtures A. General B. Volumetric Mix Design C. Materials Sampling and Testing D. Mix Design Criteria E. Aggregate Criteria
12.04	Equipment A. General B. Mixing Plant C. Truck Scales

TABLES	TITLE
12.00	Asphaltic Concrete Mix Requirements Summary
12.01	Gyratory Compaction Effort
12.02	Compaction Criteria
12.03	Voids in Mineral Aggregate
12.04	Voids Filled With Asphalt
12.05	Aggregate Adjustment Tolerance
12.06	Coarse Aggregate Angularity
12.07	Fine Aggregate Angularity
12.08	Flat and Elongated Particles
12.09	Clay Content
12.10	Gradation Control Points for 0.375 Nominal Size
12.11	Gradation Control Points for 0.500 Nominal Size
12.12	Gradation Control Points for 0.750 Nominal Size
12.13	Gradation Control Points for SPR

CHAPTER 12

ASPHALTIC CONCRETE

12.00 GENERAL

Asphaltic Concrete mixtures shall be classified as Type 1 (for use in arterial streets), Type 2 (for use in Non-Arterial streets and parking lots), Type 1P (for use in arterial street patching and temporary pavement) and Type 2P (for use in non-arterial street patching, temporary pavement, and parking lot patching) and shall consist of an intimate mixture of naturally occurring mineral aggregates of required gradations and asphalt binder content as hereinafter specified. A summary of the general requirements and uses for the various mix types is shown in Table 12.00 of these specifications. Unless otherwise specified, neither industrial nor manufacturing byproducts will be allowed in the mixture. Reclaimed Asphalt Pavement (RAP) shall be allowed as described later in these specifications. Asphaltic concrete shall be measured and paid for as provided in Chapters 1 and 5 of these Specifications.

12.01 RELATED ITEMS SPECIFIED ELSEWHERE

Chapter 1 - Pavement Construction & Reconstruction
Chapter 2 - Earthwork
Chapter 4 - Portland Cement Concrete (PCC) Base
Chapter 5 - Asphaltic Concrete Construction

12.02 MATERIALS

A. ASPHALT BINDER

The suppliers for asphalt binder used in City of Lincoln projects shall be certified by the Nebraska Department of Roads (NDOR) to supply Performance Graded Binder in Nebraska.

The asphalt binder for all mixes shall conform to the requirements of AASHTO M 320 for Performance Graded Asphalt Binder and must meet all requirements for use on NDOR projects. The PG Binder shall meet or exceed both the upper and lower temperature targets of the PG Binder grades as shown in Table 12.00 of these specifications unless directed otherwise by the Engineer.

In addition, unless for Patching or otherwise specified or directed by the Engineer, the PG Binder shall be a binder which incorporates a blend of base asphalt and elastomer modifiers of styrene-butadiene (SB), styrene-butadiene-styrene (SBS) or styrene-butadiene-ruber (SBR).

The composite material shall be thoroughly blended at the asphalt refinery or terminal prior to being loaded into the transport vehicle. The polymer modified binder shall be heat and storage stable and shall not separate when handled and stored per the suppliers storage and handling recommendations.

12.02 MATERIALS (Continued)

A. ASPHALT BINDER (Continued)

A Material Certification from the PG Binder Supplier shall be submitted prior to construction, stating the recommended mixing and compaction temperatures for the Hot Mix Asphalt. The Material Certification must state that acid has not been used. The Material Certification must also state that the material has not been air blown or oxidized.

When moisture susceptibility testing indicates the need for an anti-stripping additive, it shall be added by the PG Binder Supplier. The Contractor shall be compensated for the cost of the anti-stripping additive at the invoice price of the additive. The bill of lading or delivery ticket shall state the binder grade, specific gravity, and the percentage of anti-strip additive.

B. TACK COATS

1. Rapid-Curing Cut-Back Asphalts

The rapid-curing cut-back asphalts to be used as tack coats shall conform to the requirements of AASHTO M 81, Cut-Back Asphalt (Rapid-Curing Type).

This Specification covers liquid petroleum products, produced by fluxing an asphaltic base with suitable petroleum distillates.

2. Emulsified Asphalts

Emulsified asphalts shall conform to the following Specifications:

ASTM Designation D 977	-	Standard Spec. for Emulsified Asphalts
ASTM Designation D 2397	-	Standard Spec. for Cationic Emulsified Asphalts
ASTM Designation D 140	-	Standard Practice for Sampling Bituminous Materials
ASTM Designation D 244	-	Standard Testing Emulsified Asphalts

Emulsified asphalts covered by these Specifications shall be diluted in the distributor with sufficient potable water to reduce the asphalt residue in the mixture to approximately thirty percent (30%). Emulsified asphalt shall be homogeneous within the thirty (30) days after delivery. If separation of the emulsified asphalt has not been caused by freezing, thorough mixing shall be used to achieve a homogeneous mixture.

C. MINERAL AGGREGATES

1. General

Mineral aggregates for asphaltic concrete shall conform to the following requirements except where modified herein:

ASTM Designation D 692	-	Standard Specification for Coarse Aggregate for Bituminous Paving Mixture
ASTM Designation D 1073	-	Standard Specification for Fine Aggregate for Bituminous Paving Mixture
ASTM Designation D 242	-	Standard Specification for Mineral Filler for Bituminous Paving Mixture

12.02 MATERIALS (Continued)

C. MINERAL AGGREGATES (Continued)

1. General (Continued)

Mineral aggregates shall be crushed rock, broken stone, gravel, sand-gravel, coarse sand, fine sand or a mixture of these materials composed of clean, hard, durable, and non-coated particles, free from injurious quantities of clay, dust, soft or flaky particles, loams, shale, alkali, organic matter, or other deleterious material. Crushed rock shall be crushed limestone, granite, quartzite, or other ledge rock approved for the intended purpose by the City and shall not contain deleterious substances in a quantity exceeding three and one-half percent (3.5%) of any combination of shale, clay lumps, coal, or soft particles with shale and clay lumps not to exceed one and one-half percent (1.5%).

The absorption of water by crushed rock for use in asphaltic concrete shall not exceed three and two-tenths percent (3.2%) by weight. The gradations from any one source shall be reasonably uniform.

The mineral aggregate from different sources of supply shall not be mixed or stored in the same pile, nor used alternately in the same class of construction or mixed without permission from the Engineer. All fractions of a crushed rock gradation shall be produced from the same type of material.

The chemical and physical characteristics of the fraction passing the # 4 sieve shall be substantially the same as those of the material which may be produced in the laboratory from the fraction which is retained on the # 4 sieve.

Mineral aggregates shall have a soundness loss of not more than 12 percent by weight at the end of 5 cycles using sodium sulfate solution.

The mineral aggregate may be tested prior to its use. Generally only mineral aggregates that have been used for similar Work and have satisfactory service records will be approved. If, in the opinion of the Engineer, the mineral aggregate warrants further testing, the sampling and testing will conform to the following requirements:

ASTM C 127	-	Specific Gravity & Absorption of Coarse Aggregates
ASTM D 75	-	Standard Practice for Sampling Aggregates
ASTM C 136	-	Standard Test Method for Sieve Analysis of Fine & Coarse Aggregates
ASTM D 546	-	Standard Test Method for Sieve Analysis of Mineral Filler for Bituminous Paving Mixtures
ASTM C 128	-	Specific Gravity & Absorption of Fine Aggregates
ASTM C 131	-	Standard Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion Impact in the Los Angeles Machine
ASTM C 88	-	Standard Test Method for Soundness of Aggregate
ASTM D 693	-	Standard Spec. for Crushed Aggregate for Macadam Pavements

12.02 MATERIALS (Continued)

C. MINERAL AGGREGATES (Continued)

2. Mineral Fillers

Mineral filler shall consist of pulverized soil, pulverized crushed rock, broken stone, gravel, sand-gravel, sand, or a mixture of these materials that conforms to the following requirements:

Total Percent Passing:	Minimum	Maximum
# 50 (300 µm) Sieve	95	100
# 200 (75 µm) Sieve	80	100
Plasticity Index [material passing #200 (75 µm)]	0	3
Plasticity Index for Soil	0	6

12.03 ASPHALTIC CONCRETE MIXTURES

A. GENERAL

Asphaltic concrete for Type 1 and Type 2 mixtures shall be designed by the Contractor, according to the Asphalt Institute Superpave Mix Design Series No. 2 (SP-2), to meet the Mix Design Criteria for the appropriate mix types as shown in these specifications.

Asphaltic concrete for Type 1P and Type 2P shall be approved by the Engineer prior to use.

The Contractor will be required to define properties using a gyratory compactor that has met the Superpave evaluation test procedures, according to the gyration levels indicated in Table 12.01 for the mix type specified.

Unless otherwise specified or approved by the Engineer, Asphaltic Concrete for Type 1 Mix shall meet or exceed all of the requirements for Asphaltic Concrete type “SP4” as described in these specifications.

Unless otherwise specified or approved by the Engineer, Asphaltic Concrete for Type 2 Mix shall meet or exceed all of the requirements for Asphaltic Concrete type SPR as described in these specifications.

Unless otherwise specified or approved by the Engineer, the Blended Aggregate for Type 1 Mix shall contain no more than 80 percent limestone and shall meet the requirements of Table 12.11, Gradation Control Points For 0.500 (½) Inch Nominal Size.

Unless otherwise specified or approved by the Engineer, the Blended Aggregate for Type 2 Mix shall contain no more than 80 percent limestone and shall meet the requirements of Table 12.13, Gradation Control Points For SPR.

12.03 ASPHALTIC CONCRETE MIXTURES (Continued)

A. GENERAL (Continued)

Table 12.00
ASPHALTIC CONCRETE MIX REQUIREMENTS SUMMARY

TYPE (USE)	AC GRADE	AGGREGATE BLEND		MIX REQUIREMENTS
		% RAP (MAX.)	GRADATION REQUIREMENTS	
1 (ARTERIAL STREETS)	** PG 70-28	25%	½" BAND SUPERPAVE	SP4 (SUPERPAVE)
2 (NON-ARTERIAL STREETS AND PARKING LOTS)	** PG 58-34	35%	SPR BAND SUPERPAVE	SPR (SUPERPAVE)
* 1P (ARTERIAL PATCHING AND TEMPORARY PAVEMENT)	PG 64-22	25%	NOM. MAX. SIZE ½" - #200 SIEVE 10% MAX. LIMESTONE 30% MIN. 80% MAX. *** CRUSHED 85% MIN.	**** 5% TO 6% AC BY WEIGHT OF MIX
* 2P (NON-ARTERIAL PATCHING AND TEMPORARY PAVEMENTAND PARKING LOT PATCHING)	PG 58-28	35%		

* Types 1P and 2P mixtures must be approved by the Engineer prior to use.
** Indicates polymer modification as specified in 12.02 MATERIALS, A. ASPHALT BINDER.
*** Indicates aggregates crushed by mechanical methods.
**** Amount of AC in RAP to be determined by the Contractor prior to production.

B. VOLUMETRIC MIX DESIGN

The mix formula shall be determined by the Contractor from a mix design for each mixture. A volumetric mixture design in accordance with the latest edition of the Asphalt Institute Publication, SP-2 will be required. However, the mixture for the Superpave specimens and maximum specific gravity mixture shall be short-term aged for two hours. The following test procedures shall apply:

AASHTO R 30	-	Practice for Short and Long-Term aging of Hot Mix Asphalt
AASHTO T 84	-	Specific Gravity and Absorption of Fine Aggregate
AASHTO T 85	-	Specific Gravity and Absorption of Coarse Aggregate
AASHTO PP 19	-	Practice for Volumetric Analysis of Compacted Hot Mix Asphalt
AASHTO T 312	-	Method for Preparing and Determining the Density of Hot Mix Asphalt Specimens by Means of the Superpave Gyratory Compactor
AASHTO T 209	-	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
AASHTO T 283	-	Resistance of Compacted Bituminous Mixture to Moisture induced Damage

The optimum binder content shall be the binder content that produces required air voids, at Ndes, in the plant produced mix. The design shall have at least four points, including a minimum of two points above and one point below the optimum. The amount of un-compacted mixture shall be determined in accordance with AASHTO T 209.

Each Superpave mixture shall be tested by the Contractor for moisture susceptibility in accordance with AASHTO T 283. The loose mixture shall be short-term aged for two hours in accordance with AASHTO R30. The 6-inch specimens shall be compacted in accordance with AASHTO T 312 to 7 percent air voids at 95-mm in height and evaluated to determine if the minimum Tensile Strength Ratio (TSR) of 80 percent has been met. If the mixture has not met the minimum TSR value, the Contractor shall have the option of modifying the mixture, as approved by the Engineer, and retesting to verify that the minimum TSR of 80 percent has been achieved or by having a NDOR approved liquid anti-stripping additive added to the PG Binder, by the PG Binder Supplier, at a dosage rate, such that the mix will meet the minimum TSR of 80 percent.

All data shall be submitted with the mix design for approval. During production, the Contractor may be required by the Engineer, to provide and test additional specimens of the plant produced asphaltic concrete for moisture susceptibility. A TSR test result of less than 80 percent will require mixture modification(s) and a sample from subsequent lots will be tested by the Contractor until a TSR value of at least 80 percent is achieved.

Changes in the types or sources of aggregates or binder shall require a new job mix formula, mix design, and moisture susceptibility test. The new proposed job mix formula shall be in accordance with the requirements as stated above and submitted 5 working days prior to use for approval.

C. MATERIALS SAMPLING AND TESTING

At the beginning of each year and at least 14 days before production of asphaltic concrete, the Contractor shall submit, in writing, a tentative job mix formula and material samples as described below, for approval, to the City of Lincoln Materials Testing Laboratory. The job mix formula shall identify the mineral aggregates and mineral filler, if needed, with the value of the percent passing each specified sieve for the individual and blended materials.

A 65 pound bag of each of the individual mineral aggregates and RAP, if used, shall also be submitted to the City at this time. Each sample shall be marked to clearly indicate the type of material, name of the producer, and the pit location.

The Contractor shall submit, to the City Testing Lab, three proportioned 10,000-gram samples of the blended aggregates and a 1 gallon sample of the asphalt binder to be used in the mixture. Whenever RAP is used, it shall be processed through an ignition oven and then combined proportionally with the virgin aggregate in one of the 10,000-gram samples. The remaining two 10,000-gram samples shall be made up of the unprocessed RAP combined proportionally with the virgin aggregate. Submitted with these samples shall be a copy of the mix design values obtained from tests performed by the Contractor. This mix design shall include at a minimum, the following information:

- The bulk specific gravity (Gsb) of the blended aggregate (The specific gravity shall be determined for the combined blend from the unwashed portion of the - #4 and the + #4 material in accordance with AASHTO T 84 & T 85 respectively)
- The target asphalt binder content by total mix
- The supplier, grade, and specific gravity of the PG Binder
- The maximum specific gravity of the combined mixture (Rice)
- The average bulk specific gravity and air voids at N initial (Nini), N design (Ndes), and N maximum (Nmax) of the compacted gyratory specimens
- Voids in the Mineral Aggregate (VMA) and Voids filled with Asphalt (VFA) at Ndes
- Fine Aggregate Angularity (FAA), Coarse Aggregate Angularity (CAA), Flat and Elongated Particles and Clay Content of the aggregate blend

During production, asphaltic concrete shall be sampled and tested for quality by the City on a lot basis as defined in Chapter 5.06 paragraph C of these specifications. Tests shall include the following:

AASHTO T 209	-	Maximum specific gravity of the mix (Rice)
ASTM C 136	-	Standard Test Method for Sieve analysis of Fine and Coarse Aggregate
AASHTO T312	-	Method for Preparing and Determining the Density of Hot Mix (HMA) Asphalt Specimens by Means of the Superpave Gyratory Compactor
AASHTO T 166	-	Bulk Specific Gravity of compacted Bituminous Mixtures using saturated surface-dry specimens
		Asphalt binder content of total mix by ignition
		National Center for Asphalt Technology

D. MIX DESIGN CRITERIA

The design criteria for each mixture shall be determined from Tables 12.01, 12.02, 12.03, and 12.04.

The optimum binder content shall be the binder content that produces 4.0% +/- 1% air voids at Ndes for SP4 mixes and 3.0% +/- 1% at Ndes for SPR mixes.

Table 12.01
GYRATORY COMPACTION EFFORT
Average Design High Air Temperature = < 39 degrees C (102° F)

Asphaltic Concrete Type	Nini	Ndes	Nmax
SPR	7	65	100
SP4	8	96	152

Table 12.02
COMPACTION CRITERIA

Mix Criteria	SPR	SP4
%Gmm at Nini		89.0
%Gmm at Ndes	96.0 -98.0	
%Gmm at Nmax		98.0

Table 12.03
VOIDS IN MINERAL AGGREGATE
Criteria at Ndes

Nominal Maximum Aggregate Size	Minimum VMA, Percent
SPR	12.0
½ (0.500) inch	14.0

Table 12.04
VOIDS FILLED WITH ASPHALT
Criteria at Ndes

Asphaltic Concrete Type	Design VFA, Percent
SPR	70 - 80
SP4	65 - 75

D. MIX DESIGN CRITERIA (Continued)

If at the end of the day's production, either of the two following conditions occurs, the Contractor will not be allowed to resume production until corrective adjustments are made to the mix design:

1. Air Voids, VMA, VFA, FAA, CAA or Binder content do not meet the currently approved criteria.

2. Rutting occurs.

Mix adjustments at the plant are authorized within the limits shown in Table 12.05 without redesigning the initially approved mix.

The adjustment must produce a mix with the percent air voids and all other properties as stated in these specifications.

All adjustments must be reported to the Engineer.

The adjustment values in Table 12.05 will be the tolerances allowed for changes indicated by production or mix design test results, but cannot deviate from Superpave gradation criteria.

Table 12.05
AGGREGATE ADJUSTMENT TOLERANCE

Aggregate Adjustments	
Sieve Size	Adjustment Range
1 inch, 3/4 inch, ½ inch, 3/8 inch	± 6%
No. 8, No. 16, No. 30, No. 50	± 4%
No. 200	± 2%

E. AGGREGATE CRITERIA

1. Coarse Aggregate Angularity (CAA)

The coarse aggregate angularity value of the blended aggregate material shall meet or exceed the minimum values for the appropriate asphaltic concrete type shown in Table 12.06.

Table 12.06
COARSE AGGREGATE ANGULARITY
(ASTM D 5821)

Asphaltic Concrete Type	CAA (minimum)
SPR	83
SP4	85/80*

* Denotes two faced crushed requirements

E. AGGREGATE CRITERIA (Continued)

1. Coarse Aggregate Angularity (CAA) (Continued)

Aggregate obtained from the residue of the ignition process shall not be used for the determination of CAA for mix design approval except when RAP material is specified and must be combined with the proportioned amount of virgin aggregate as defined by the mix design.

2. Fine Aggregate Angularity (FAA)

The fine aggregate angularity value of the blended aggregate material shall meet or exceed the minimum values for the appropriate asphaltic concrete type shown in Table 12.07.

The specific gravity for calculation of the FAA shall be based on a combined aggregate sample of material passing the No. 8 sieve and retained on the No. 100 sieve.

Table 12.07
FINE AGGREGATE ANGULARITY
(AASHTO T 304 Method A)

Asphaltic Concrete Type	FAA (minimum)
SPR	43.0
SP4	45.0

Aggregate obtained from the residue of the ignition process shall not be used for the determination of FAA for mix design approval except when RAP material is specified and must be combined with the proportioned amount of virgin aggregate as defined by the mix design.

3. Flat and elongated particles

The coarse aggregate shall not contain flat and elongated particles exceeding the maximum value for the appropriate asphaltic concrete type shown in Table 12.08.

Table 12.08
FLAT AND ELONGATED PARTICLES*
(ASTM D 4791)

Asphaltic Concrete Type	Percent, Maximum
SPR	10
SP4	10

* Criterion based on a 5:1 maximum to minimum ratio

E. AGGREGATE CRITERIA (Continued)

4. Clay Content

The Clay Content of the blended aggregate material shall be such that the Sand Equivalent Minimum value for the appropriate asphaltic concrete type as shown in Table 12.09 shall be met or exceeded.

Table 12.09
CLAY CONTENT
(AASHTO T 176)

Asphaltic Concrete Type	Sand Equivalent, Minimum
SPR	45
SP4	45

5. Gradation

The blended aggregate shall conform to the gradation requirements specified below for the appropriate nominal size.

The dust to binder ratio is the ratio of the percentage by weight of aggregate finer than the No. 200 sieve to the asphalt content expressed as a percent by weight of total mix. The dust to binder ratio shall be between 0.7 and 1.7. This shall be verified during mix design approval and production sample testing.

Table 12.10
GRADATION CONTROL POINTS FOR 0.375 (3/8) INCH NOMINAL SIZE

	Control Points		Restricted Zone Boundary	
	(percent passing)		(percent passing)	
Sieve	Minimum	Maximum	Minimum	Maximum
½ inch	100.0			
3/8 inch	90.0	100.0		
No. 4		90.0		
No. 8	32.0	67.0	47.2	47.2
No. 16			31.6	37.6
No. 30			23.5	27.5
No. 50			18.7	18.7
No. 200	2.0	10.0		

E. AGGREGATE CRITERIA (Continued)

5. Gradation (Continued)

Table 12.11
GRADATION CONTROL POINTS FOR 0.500 (½) INCH NOMINAL SIZE

	Control Points		Restricted Zone Boundary	
	(percent passing)		(percent passing)	
Sieve	Minimum	Maximum	Minimum	Maximum
3/4 inch	100.0			
½ inch	90.0	100.0		
3/8 inch		90.0		
No. 8	28.0	58.0	39.1	39.1
No. 16			25.6	31.6
No. 30			19.1	23.1
No. 50			15.5	15.5
No. 200	2.0	10.0		

Table 12.12
GRADATION CONTROL POINTS FOR 0.750 (3/4) INCH NOMINAL SIZE

	Control Points		Restricted Zone Boundary	
	(percent passing)		(percent passing)	
Sieve	Minimum	Maximum	Minimum	Maximum
1 inch	100.0			
3/4 inch	90.0	100.0		
½ inch		90.0		
No. 8	23.0	49.0	34.6	34.6
No. 16			22.3	28.3
No. 30			16.7	20.7
No. 50			13.7	13.7
No. 200	2.0	8.0		

12.03 ASPHALTIC CONCRETE MIXTURES (Continued)

E. AGGREGATE CRITERIA (Continued)

5. Gradation (Continued)

Table 12.13
GRADATION CONTROL POINTS FOR SPR

	Control Points (percent passing)	
Sieve	Minimum	Maximum
3/4 inch	100.0	
3/8 inch	81.0	96.0
No. 8	50.0	60.0
No. 50	12.0	21.0
No. 200	4.0	8.0

12.04 EQUIPMENT

A. GENERAL

All equipment, tools and machinery shall be adequate for the purpose for which it is to be used and shall be maintained in satisfactory working condition at all times. The following listed units of equipment shall conform to the requirements specified herein.

The Contractor shall furnish the necessary accessories and personnel and shall perform calibrations on the equipment. Copies of the calibration data shall be provided to the Engineer before production of Asphaltic Concrete. In the event problems are encountered during the calibrations, the Contractor shall arrange for a trained technician or company representative of the company from which the equipment was obtained to make the necessary repairs and/or adjustments to the equipment. Calibrations shall be made as often as is deemed necessary by the Engineer to ensure accuracy of the equipment.

In the event that a Contractor elects to obtain asphaltic concrete from a commercial plant not under his direct control, he shall reach agreement with the commercial producer to perform the above functions in the same manner as though the plant was under his direct control. The Contractor shall also reach agreement with the producer to furnish or shall arrange to have furnished an approved building for the use of an observer if deemed necessary by the Engineer.

12.04 EQUIPMENT (Continued)

B. MIXING PLANT

1. General

The equipment that is used for heating, proportioning, and mixing the aggregates and asphalt cement shall be able to produce a uniform mixture.

The dryers shall be able to dry and heat all aggregates to the required temperatures with positive control. Aggregates shall be agitated continuously during the process of heating. Damage to the asphalt cement in dryer-drum type mixing plants shall be avoided.

Salvaged bituminous material shall not be exposed to open flame.

Continuous temperature and time readings of the asphaltic materials shall be electronically recorded whenever the plant is operated. A copy of the temperature reading shall be made available to the Engineer. Temperature and time displays shall be easily accessible. Temperature and time sensors will be provided at the following locations:

a. Inside the asphaltic concrete mixture discharge chute.
b. Inside the surge bin.
c. Inside the asphalt cement storage tank.

During storage, the asphalt cement temperature shall be maintained between 250F and 350F or at the storage temperature range recommended by the binder supplier. All plants shall be equipped with a circulating system for asphalt cement which is designed to assure proper and continuous circulation during the operating period. Storage tanks shall have sufficient capacity to provide for continuous operation. The tanks shall be situated and constructed to allow the volume of the asphalt cement to be safely and accurately determined at any time.

If the plant is equipped with a surge bin for the temporary storage of asphaltic concrete, the asphaltic concrete taken from the surge bin will not differ significantly form the material taken directly from the plant. The first material entering the bin will be the first material removed. The surge bin shall be completely emptied at the end of each operating day unless insulated or heated.

All plants shall be equipped with a continuously operated dust collector. The collected material may be wasted or returned to the mix.

Mineral filler bins shall be protected from moisture.

2. Pugmill Plants

a. General

Pugmill plants shall include cold aggregate feeders, oversize screens, storage bins for dried aggregate, ingredient proportioning devices, and all other equipment necessary to produce the specified mixture. The pugmill blades shall have a minimum clearance of 3/4 inch from all fixed and moving parts. The mixer shall be equipped with a discharge hopper holding approximately 1 ton of hot mixture and capable of intermittent discharge.

12.04 EQUIPMENT (Continued)

B. MIXING PLANT (Continued)

2. Pugmill Plants (Continued)

b. Batch Plants

Batch plants shall have an accurate time lock to control the operations during a complete mixing cycle. They shall lock the scale box gate after the charging of the mixer until the closing of the mixer gate at the completion of the cycle. They shall lock the bituminous material bucket throughout the dry mixing period and shall lock the mixer gate throughout the dry and wet mixing periods.

The dry mixing period is defined as the time between the opening of the scale box gate and the addition of bituminous material. The wet mixing period is the interval of time between the addition of bituminous material and the opening of the mixer gate.

The control of the timing shall be flexible and capable of being set at 5-second intervals or less throughout a total cycle of not less than 3 minutes. A mechanical batch counter shall be installed as a part of the timing device and shall be designed and constructed to register only upon the release of the bituminous material. It shall not register any dry batches or any material wasted through the bins. The timing device shall have a suitable case with a locking door that shall always be kept closed and locked except when adjustments or repairs are required.

All batch plants shall be equipped with an asphalt cement volume meter or a heated or insulated asphalt bucket with scales.

Scale hoppers and scales for proportioning aggregates and asphalt to the batch plant's mixer shall be accurate within 0.5 percent; and they shall be sensitive within 0.2 percent or 2 pounds, whichever is greater, throughout the range of use.

c. Continuous Type

Plants shall be equipped with a pump synchronized to the feeding mechanism so that the required percentage of asphalt cement is applied continuously and uniformly. The feeding system shall be synchronized to the rest of the plant.

3. Dryer-Drum Plants

These plants shall include cold aggregate feeders, vibratory screening units for removing oversize material from both virgin and reclaimed material, proportioning devices for controlling the quantity of each ingredient in the mixture, and any other equipment necessary to produce the mixture as specified.

Plants shall be equipped with a pump synchronized to the feeding mechanism so that the required percentage of asphalt cement is applied continuously and uniformly. The feeding system shall be synchronized to the rest of the plant.

12.04 EQUIPMENT (Continued)

C. Truck Scales

Truck scales shall be furnished by the Contractor for weighing loaded trucks at the plant site, and shall be installed on adequate foundations and in accordance with the manufacturer's recommendations. The scales shall have sufficient capacity to weigh the maximum axle, combination of axles or gross load used and shall be accurate to one-half percent (0.5%) of the total axle load or total load.

Scales shall be properly calibrated by the Contractor in the presence of the Engineer unless the scales have current Nebraska Department of Agriculture inspection approval or unless calibration and adjustment by a recognized scale company service crew has been performed during the current season, and attested to by a City of Lincoln representative. The scales shall be periodically cross-checked for accuracy during the course of the Work by checking the net weight of loads of the material being produced on commercial scales in the vicinity of the project which have current agriculture inspection approval. The Contractor shall furnish at least ten (10) 50 pound weights for checking the accuracy of the scales. If the scale is not capable of weighing all axles at one time, the approaches shall be extended so the entire hauling unit will be level during weighing. Chuck holes, ruts or high spots in the approaches which develop during hauling operations shall be immediately repaired as directed by the Engineer.

All weighing shall be done with the hauling unit stationary, level, and out of gear. Suitable protection shall be provided against wind currents that may affect the accuracy of the scales. The platform of the scale shall be kept clean and free from accumulations of materials, as directed by the Engineer.

Serially numbered duplicated scale tickets shall be furnished to accompany each truck load of material to the unloading point. Scale tickets shall reflect the date, time, load number, total weight, tare weight, project number, mix type, destination, and net weight.

BUILDING INFORMATION REPORT

Facility:	**HOBSON YARD**	**Building Name:**	**ELECTRICAL, COMMUNICATIONS, & SIGNAL BUIL**
City:	LINCOLN, NE	**Building Number:**	

Construction Date:	1945		
Original Owner:	CB&Q	**Bldg Const Type:**	METAL FRAME
Location Marker:	200 N. 6TH STREET	**Floor Const Matl:**	CONCRETE
Latitude:	40.81557	**Floor Covering:**	12" FLOOR TILE
Longitude:	96.71234	**Roofing:**	METAL
Bldg Status:	IN-PLACE	**Roof Construction:**	METAL
Existing Plans:	FIELD SKETCH	**Ceiling:**	FACED FIBERGLASS, WOOD, 2'X4' CEILING TILE
Number of Floors:	1	**Exterior Wall:**	METAL
Approx Floor Area:	6000	**Interior Wall:**	WOOD, CEMENT BLOCK

BUILDING INSULATION

HVAC Code	HVAC Insulation
	NONE
BOILER HT.WATER	FIBERGLASS

BUILDING USES

Use	Percent of Total Area
OFFICES	50
STORAGE	50

BUILDING RENOVATIONS

BUILDING OWNERS

INSPECTION HISTORY

Start Date	End Date	Project Name	Project No.	Inspector Name	Inspection Reason
3/19/1992	3/19/1992	INITIAL INSPECTION			
7/15/1998	7/15/1998	REINSPECTION	2662.13	SCOTT RHEN	
8/27/1999	8/27/1999	DESIGN REMOVAL	3626.06	SCOTT RHEN	
9/5/2001	9/5/2001	VERMICULITE SURVEY	5410.001-2	SCOTT RHEN	SYSTEM-WIDE INSPECTION

HOMOGENEOUS AREAS

Number	Description	General Area	ACM Type	Percent
LN-LHY-ESB-16	12" FLOOR TILE	ELECTRICIAN OFFICES	NON-ACM	
LN-LHY-ESB-17	12" FLOOR TILE	ELECTRICIAN BATHROOM	NON-ACM	
LN-LHY-ESB-18	PIPE FITTING MUD	6" HOT WATER SUPPLY LINE	CHRYSOTILE	30

BUILDING INFORMATION REPORT

Facility:	**HOBSON YARD**	**Building Name:**	**ELECTRICAL, COMMUNICATIONS, & SIGNAL BUIL**
City:	LINCOLN, NE	**Building Number:**	

Homogeneous Physical Assessment Report

Location

State: NE **Facility:** HOBSON YARD **Building Name:** ELECTRICAL, COMMUNICATIONS

Homogeneous Area Description

Description: PIPE FITTING MUD
General Area: 6" HOT WATER SUPPLY LINE
Category: TSI **Class:** FRI.
Color: WHITE **Amount:** 52 L.F.
Material Status: REMOVED **Date Removed:** 8/27/1999

Damage Assessment

Condition Assessment: DAMAGED
Percent Damage:
Extent Damage:
Physical Damage:
Water Damage:
Deterioration:
Vibration:

Exposure Factors

Visible:
Accessibility:
Barriers:
Activity:
Ventilation:
Air Erosion:

Sample Result

Sample Number: LN-LHY-ESB-18 **Sample Date:** 4/14/1993
Asbestos Type: CHRYSOTILE **Percent:** 30

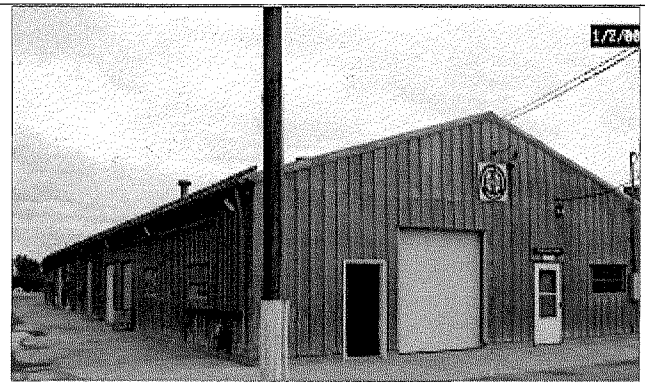
Signed:		AHERA No.:
		State Certification No.:
Signed:		AHERA No.:
		State Certification No.:

ASBESTOS CONTAINING MATERIALS SUMMARY

State: NE **City: LINCOLN** **Facility: HOBSON YARD**

Building Name: ELECTRICAL, COMMUNICATIONS, & SIGNAL BUILDING

Latitude: 40.81557 **Longitude: 96.71234**



Inspection Date: 4/14/1993

Sample Number	Description	General Area	Class	Amount	Units	Condition	Asbestos Type	Status
LN-LHY-ESB-16	12" FLOOR TILE	ELECTRICIAN OFFICES	N/A	0	S.F.	N/A	NON-ACM	N/A
LN-LHY-ESB-17	12" FLOOR TILE	ELECTRICIAN BATHROOM	N/A	0	S.F.	N/A	NON-ACM	N/A
LN-LHY-ESB-18	PIPE FITTING MUD	6" HOT WATER SUPPLY LINE	FRI.	52	L.F.	DAMAGED	CHRYSOTILE	REMOVED 8/27/1999

BUILDING INFORMATION REPORT

Facility:	**HOBSON YARD**	**Building Name:**	**B & B QUONSET HUT**
City:	LINCOLN, NE	**Building Number:**	

Construction Date:	1940		
Original Owner:	CB&Q	**Bldg Const Type:**	METAL AND WOOD FRAME
Location Marker:	200 N. 6TH STREET	**Floor Const Matl:**	CONCRETE
Latitude:	40.8149	**Floor Covering:**	12" FLOOR TILE
Longitude:	96.7128	**Roofing:**	METAL
Bldg Status:	IN-PLACE	**Roof Construction:**	METAL
Existing Plans:	FIELD SKETCH	**Ceiling:**	TRANSITE, 2'X2' CEILING TILE
Number of Floors:	1	**Exterior Wall:**	METAL
Approx Floor Area:	3080	**Interior Wall:**	TRANSITE BOARD, WOOD

BUILDING INSULATION

HVAC Code	HVAC Insulation
BOILER HT.WATER	NONE

BUILDING USES

Use	Percent of Total Area
OFFICES	18
SHOP	27
STORAGE	55

BUILDING RENOVATIONS

BUILDING OWNERS

INSPECTION HISTORY

Start Date	End Date	Project Name	Project No.	Inspector Name	Inspection Reason
4/14/1993	4/14/1993	INITIAL INSPECTION			
7/15/1998	7/15/1998	DESIGN REMOVAL	3626.01	SCOTT RHEN	
9/8/2001	9/8/2001	VERMICULITE SURVEY	5410.001-2	SCOTT RHEN	SYSTEM-WIDE INSPECTION
5/9/2007	5/9/2007	REINSPECTION	7909.001	SCOTT RHEN	
4/28/2008	4/30/2008	ABATEMENT	8341.001	SCOTT RHEN	
3/3/2011	3/3/2011	REINSPECTION	9480.001	DAVID WELCH	

HOMOGENEOUS AREAS

Number	Description	General Area	ACM Type	Percent
LN-LHY-BB-06	12" FLOOR TILE/MASTIC	CARPENTER SHOP	NON-ACM	

BUILDING INFORMATION REPORT

Facility:	**HOBSON YARD**	**Building Name:**	**B & B QUONSET HUT**
City:	LINCOLN, NE	**Building Number:**	

LN-LHY-BB-07	12" FLOOR TILE/MASTIC	CARPENTER SHOP	NON-ACM	
LN-LHY-BB-08	12" FLOOR TILE/MASTIC	CARPENTER SHOP	NON-ACM	
LN-LHY-BB-09	12" FLOOR TILE/MASTIC	CARPENTER SHOP	NON-ACM	
LN-LHY-BB-10	12" FLOOR TILE/MASTIC	CARPENTER SHOP	NON-ACM	
LN-LHY-BB-11	12" FLOOR TILE/MASTIC	CARPENTER SHOP	NON-ACM	
LN-LHY-BB-12	2'X4' CEILING TILE	CARPENTER SHOP	NON-ACM	
LN-LHY-BB-13	2'X4' FISSURED, TINY PERFORATED CEILING TILE	CARPENTER SHOP	NON-ACM	
LN-LHY-BB-14	2.5'X5' CEILING TILE	CARPENTER SHOP	NON-ACM	
LN-LHY-BB-15	TRANSITE BOARD	INTERIOR WALLS OF SHOP & OFFICE AREA	CHRYSOTILE	40

Homogeneous Physical Assessment Report

Location

State: NE **Facility:** HOBSON YARD **Building Name:** B & B QUONSET HUT

Homogeneous Area Description

Description: TRANSITE BOARD
General Area: INTERIOR WALLS OF SHOP & OFFICE AREA
Category: MISC **Class:** N.F. II
Color: GREY **Amount:** 1800 S.F.
Material Status: REMOVED-PARTIAL **Date Removed:** 4/30/08

Damage Assessment

Condition Assessment: DAMAGED
Percent Damage:
Extent Damage:
Physical Damage:
Water Damage:
Deterioration:
Vibration:

Exposure Factors

Visible:
Accessibility:
Barriers:
Activity:
Ventilation:
Air Erosion:

Sample Result

Sample Number: LN-LHY-BB-15 **Sample Date:** 4/14/1993
Asbestos Type: CHRYSOTILE **Percent:** 40

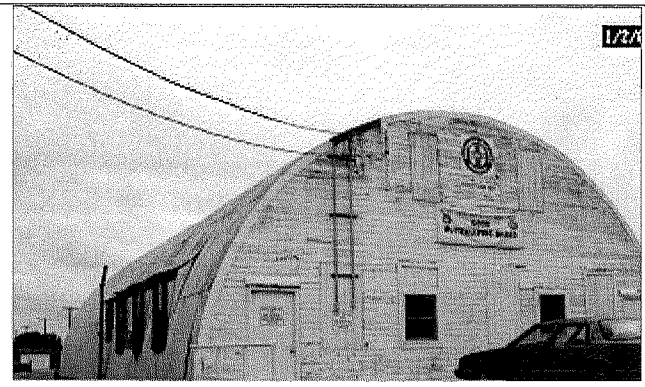
Signed:		AHERA No.:
		State Certification No.:
Signed:		AHERA No.:
		State Certification No.:

ASBESTOS CONTAINING MATERIALS SUMMARY

State: NE **City: LINCOLN** **Facility: HOBSON YARD**

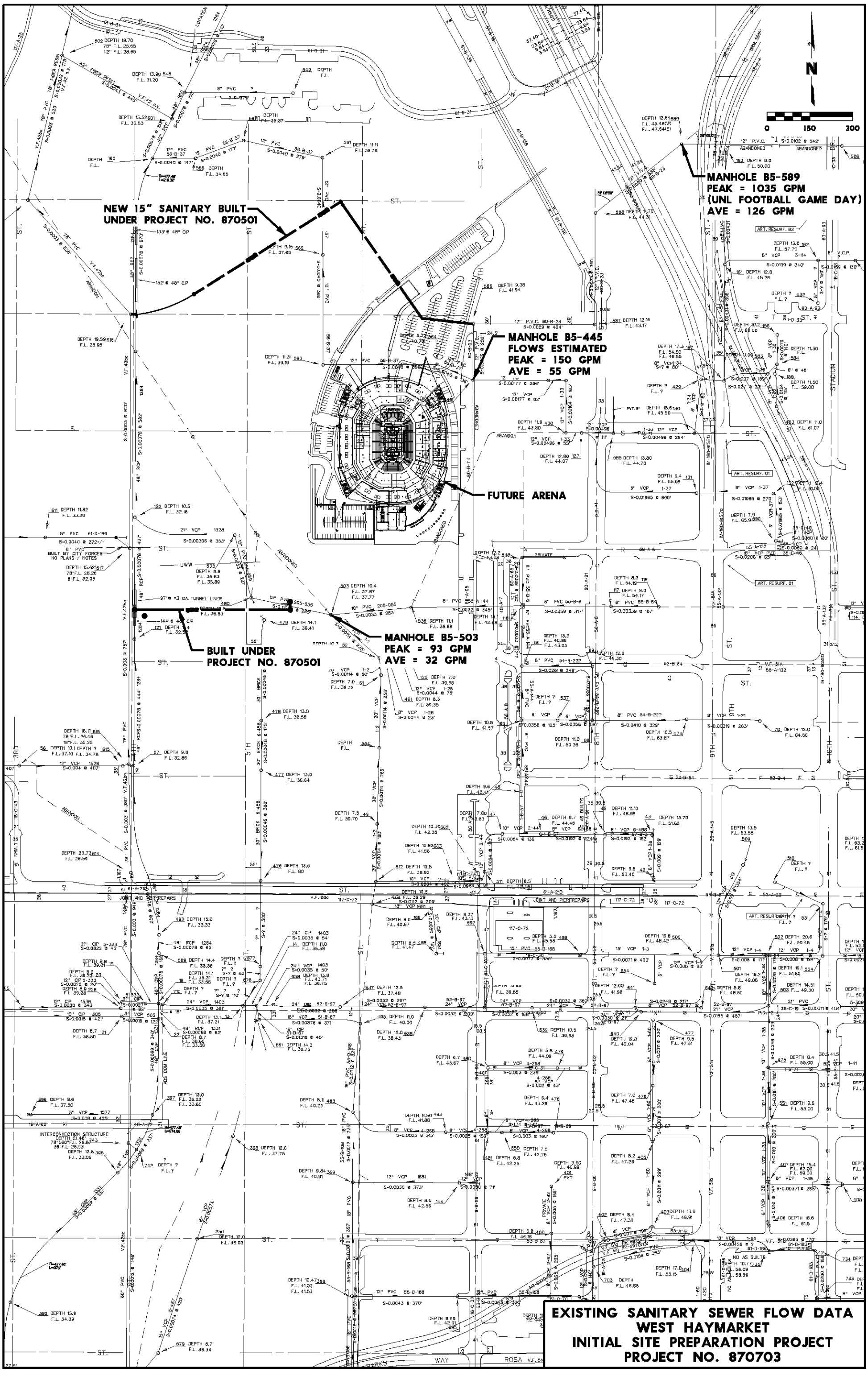
Building Name: B & B QUONSET HUT

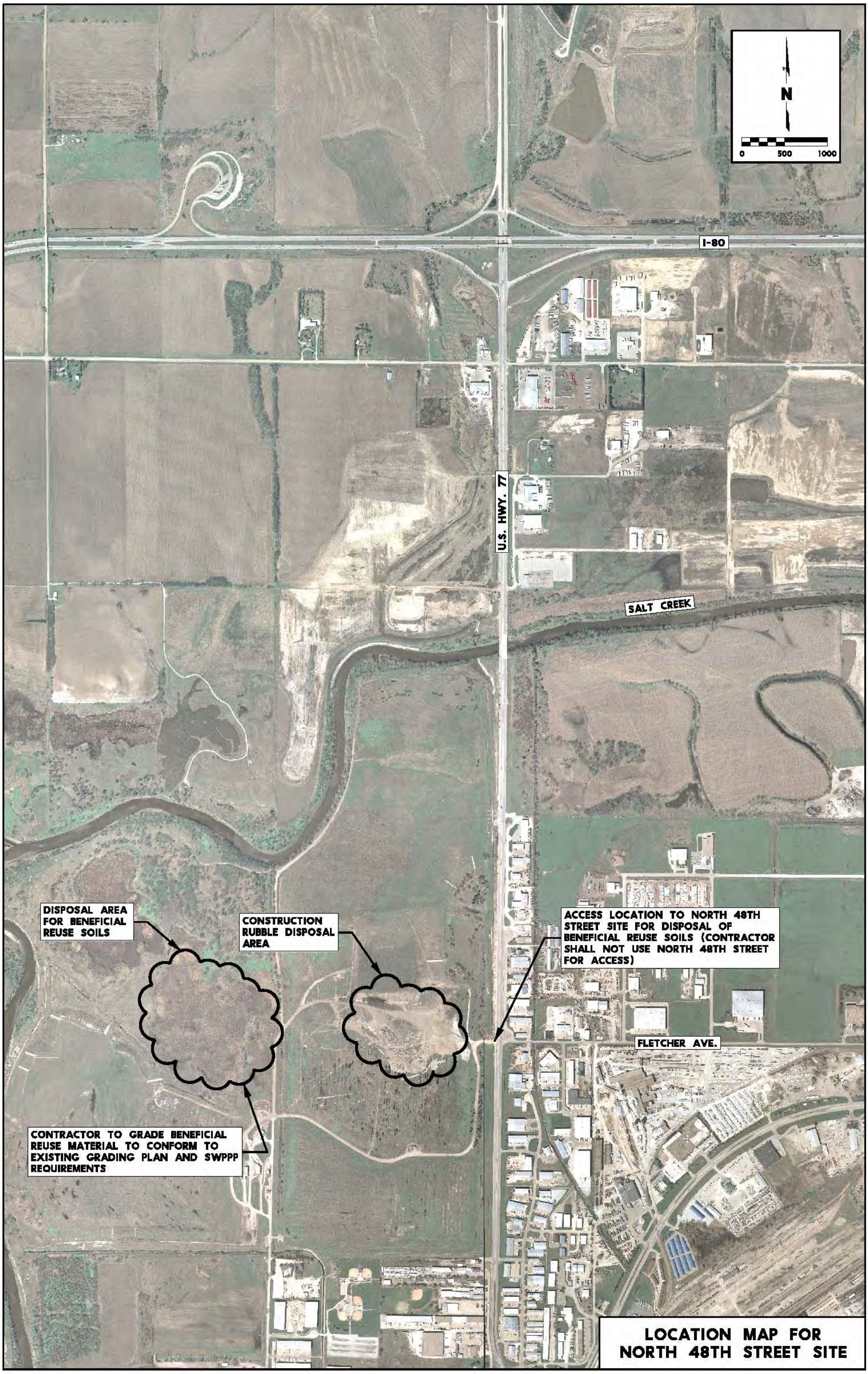
Latitude: 40.8149 **Longitude: 96.7128**



Inspection Date: 4/14/1993

Sample Number	Description	General Area	Class	Amount	Units	Condition	Asbestos Type	Status
LN-LHY-BB-06	12" FLOOR TILE/MASTIC	CARPENTER SHOP	N/A	0	S.F.	N/A	NON-ACM	N/A
LN-LHY-BB-07	12" FLOOR TILE/MASTIC	CARPENTER SHOP	N/A	0	S.F.	N/A	NON-ACM	N/A
LN-LHY-BB-08	12" FLOOR TILE/MASTIC	CARPENTER SHOP	N/A	0	S.F.	N/A	NON-ACM	N/A
LN-LHY-BB-09	12" FLOOR TILE/MASTIC	CARPENTER SHOP	N/A	0	S.F.	N/A	NON-ACM	N/A
LN-LHY-BB-10	12" FLOOR TILE/MASTIC	CARPENTER SHOP	N/A	0	S.F.	N/A	NON-ACM	N/A
LN-LHY-BB-11	12" FLOOR TILE/MASTIC	CARPENTER SHOP	N/A	0	S.F.	N/A	NON-ACM	N/A
LN-LHY-BB-12	2'X4' CEILING TILE	CARPENTER SHOP	N/A	0	S.F.	N/A	NON-ACM	N/A
LN-LHY-BB-13	2'X4' FISSURED, TINY PERFORATED CEILING TILE	CARPENTER SHOP	N/A	0	S.F.	N/A	NON-ACM	N/A
LN-LHY-BB-14	2.5'X5' CEILING TILE	CARPENTER SHOP	N/A	0	S.F.	N/A	NON-ACM	N/A
LN-LHY-BB-15	TRANSITE BOARD	INTERIOR WALLS OF SHOP & OFFICE AREA	N.F. II	1800	S.F.	DAMAGED	CHRYSOTILE	REMOVED-PARTIAL 4/30/08


NEW 15" SANITARY BUILT
UNDER PROJECT NO. 870501
MANHOLE B5-589
PEAK = 1035 GPM
(UNL FOOTBALL GAME DAY)
AVE = 126 GPM
MANHOLE B5-445
FLOWS ESTIMATED
PEAK = 150 GPM
AVE = 55 GPM
FUTURE ARENA
MANHOLE B5-503
PEAK = 93 GPM
AVE = 32 GPM
BUILT UNDER
PROJECT NO. 870501
N
0 150 300
EXISTING SANITARY SEWER FLOW DATA
WEST HAYMARKET
INITIAL SITE PREPARATION PROJECT
PROJECT NO. 870703
DATE: 8/31/2011
DGN: F:\PROJECTS\015-2431\Design\Sheets_Site_Prep\San Flow Data.dgn



LOCATION MAP FOR NORTH 48TH STREET SITE

DATE: 3/31/2011
DGN: F:\PROJECTS\010-2431\Design\Sheets_Site_Prep\US HWY 77_I-80.dgn

ADDENDUM NO. 1

WEST HAYMARKET JOINT PUBLIC AGENCY
HAYMARKET INFRASTRUCTURE IMPROVEMENT
INTITIAL HAYMARKET SITE PREPARATION
PROJECT NO. 870703
BID NO. 11-079

Addenda are instruments issued by the Purchasing Office prior to the date or time for receipt of offers which will modify or interpret the specifications document by addition, deletion, clarification or correction.

Please acknowledge receipt of this addendum in the space provided in the Attribute Section.

Please be advised of the following changes and clarifications to the City's specification and bidding documents:

1. A Pre-Bid Meeting for this project has been scheduled for Tuesday, April 12, 2011 from 1:00 pm to 3:00 pm. The meeting will be held at the City of Lincoln's Municipal Services Center, 901 West Bond Street, Lincoln, Nebraska. All prospective bidders are encouraged to attend.

2. The bid form and the Summary of Quantities, Sheet 2 in the plans have been updated as follows:

   The following bid items have been deleted:

02.0401	Excavation-Disposal	45,283 CY
50.0010	Disposal of Stockpiled Soils	19,000 CY
50.0010	Grading for North 48th Street Site	64,283 CY
50.0015	SWPPP Compliance for North 48th Street Site	1 LS

   The following bid items have been added:

50.0010	Excavation for Beneficial Reuse Soils	44,283 CY
50.0010	Excavation for Construction and Demolition Waste	1,000 CY
50.0010	Stockpiled Soils for Beneficial Reuse	18,500 CY
50.0010	Stockpiled Soils, Construction and Demolition Waste	500 CY
50.0010	Grading and Placement of Beneficial Reuse Soils	62,783 CY

3. Refer to the Special Provisions, page 22, "Earthwork Construction".

   Delete this Special Provision in it's entirety and replace with the revised "Earthwork Construction" Special Provision that is attached to this addendum.

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4. Refer to the Special Provisions, page 28, "North 48th Street Disposal Site".

   Delete this Special Provision in it's entirety and replace with the new Special Provision titled "North 48th Street Solid Waste Facility Beneficial Soils and Construction and Demolition Waste Material Requirements" that is attached to this addendum.

5. Refer to the Special Provisions, page 68, "Additional Specifications Sections".

   Replace the North 48th Street Site Plan with the updated "Location Map for the North 48th Street Solid Waste Facility" which is attached to this addendum. Include the Geotechnical Report for Stockpiled Soils which is attached to this addendum. Include the final Asbestos Reports for the BNSF Quonset Building and the BNSF Electrical, Communications & Signal Building which are attached to this addendum.

6. Refer to the plans, Sheet No. 6, General Notes, "Earthwork Summary Table".

   Delete the table shown in the existing plans and replace with the attached revised Earthwork Summary table and notes.

7. Refer to the plans, Sheet 4 (Typical Sections) & Sheets XS-1 thru XS-36, (Cross Sections).

   All references to "Excavation-Disposal" with respect to the typical sections and the cross sections shall be revised to "Excavation for Beneficial Reuse".

8. The geotechnical report for the Phase II portion of the project (approximate Stations 2096+00 to 2107+50) is currently being finalized and will be provided under a future addendum. The SWPPP and the grading plan for the work and placement of Beneficial Reuse Soils at the North 48th Street Solid Waste Facility is currently being finalized by the City's Solid Waste Management Department and will be made available to bidders under a future addendum.

Dated this 6th day of April, 2011.

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ENVIRONMENTAL CONTINGENCY PLAN

During the execution of the work on this project it is anticipated that the Contractor may encounter contaminated soils, debris or groundwater (media). If contaminated media is encountered and it is determined by the West Haymarket Environmental Team that it cannot be used on-site (e.g. as backfill for the utility trenches), the Contractor shall be required to dispose of any contaminated media in accordance with all federal, state and local laws.

The Contractor shall also strictly adhere to the requirements and procedures set forth in the Environmental Contingency Plan. The Environmental Contingency Plan is attached and incorporated as if fully set forth herein.

In the event the Contractor or on-site construction management personnel suspect that contaminated media is encountered or will be during the performance of the work, they shall immediately notify the West Haymarket Environmental Team and follow the procedures outlined in the Environmental Contingency Plan for resolution on how to manage the contaminated media. Typical indications of potentially contaminated media include discoloration, odors associated with the media removed as part of boring, trenching or other excavation work. In addition, the Environmental Contingency Plan illustrates where environmental testing has been taken on-site. The Contractor shall familiarize themselves with these Figures to determine whether the project is located in the area of these environmental impacts.

Management of Soil or Debris to be Removed from the Work Site

During the course of the project the Contractor shall not haul any excavated material off-site without the prior approval of the West Haymarket Environmental Team. As such, the Contractor shall provide locations on-site to temporarily stockpile all excavated material that has not been approved by the West Haymarket Environmental Team for removal from the site. All temporary stockpiles shall comply with the requirements set forth in the Construction Storm Water Pollution Prevention Plan (SWPPP). The West Haymarket Environmental Team will determine the appropriate method for disposal of the excavated material and make a recommendation to the Contractor.

The Contractor shall base their bid on the basis that all excavated or stockpiled soils from this project that are not used in the construction of the fills and embankments, but that meet the requirements for beneficial reuse soils shall be hauled to the North 48th Street Solid Waste Facility for placement. Excavated or stockpiled soils not reused in the fills and embankments that do not meet the requirements for beneficial reuse soils but that are classified as Construction and Demolition waste shall be hauled to the North 48th Street Solid Waste Facility for disposal at the Construction and Demolition Waste Disposal Area. Beneficial reuse soils shall be as described in the Special Provision for the North 48th Street Solid Waste Facility Beneficial Soils and Construction and Demolition Waste Material Requirements. If the excavated material requires special handling due to contamination (petroleum or other chemicals) and the contamination is not the result of the Contractor's activities, then additional compensation for disposal of the contaminated material will be considered on an "Extra Work" basis.

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EARTHWORK CONSTRUCTION

Detailed geotechnical investigations and reports have been prepared for the West Haymarket project. Copies of these reports are available and attached to these Special Provisions for the Contractor's use in bidding and construction of the improvements. The Contractor is fully responsible for reviewing the reports and the report recommendations and shall take this information into consideration when preparing their bid for the project.

Earthwork on the project shall be measured and paid for as generally outlined in the Standard Specification for Municipal Construction and as modified by these Special Provisions. Pay items for earthwork on this project shall include: Excavation for Beneficial Reuse Soils, Excavation of Construction and Demolition Waste, Over-excavation, Earthwork Measured in Embankment, Stockpiled Soils Reused in Embankment, Surcharge Embankment, Surcharge Removal and Reuse in Phase II Embankment, Stockpiled Soils for Beneficial Reuse and Stockpiled Soils, Construction and Demolition Waste. Grading of the beneficial reuse soils at the North 48th Street Solid Waste Facility shall be measured by the cubic yard and shall be paid for at the fixed unit price shown in the contract documents of $1.25 per cubic yard. In addition the Geotechnical Reports identified the potential need for subgrade stabilization at lower areas to facilitate the work associated with the over-excavation. Work associated with stabilizing the subgrade shall be paid for directly in accordance with the appropriate pay items for the Geotechnical Fabric and Granular Material.

The JPA reserves the right to adjust the actual quantities for the various bid items outlined for the earthwork construction based upon the field conditions or other factors encountered at the time the work is completed. The unit prices for the various earthwork construction items shall not be adjusted due to changes in the quantities unless otherwise approved by the Engineer.

Excavation for Beneficial Reuse Soils

Excavation for Beneficial Reuse Soils shall include the removal of the existing upper portion of unsuitable materials as shown on the plans and hauling of this material to the North 48th Solid Waste Facility for beneficial reuse of the material. The work associated with the excavation of the unsuitable materials at the West Haymarket Project site shall be completed in accordance with the recommendations and requirements outlined in the Geotechnical Reports.

The West Haymarket Environmental Team will have a representative on-site to review the excavation of the soils to verify that the material being removed generally meets the previously defined characteristics for soils which have been tested for contamination and are acceptable for use as beneficial reuse soils. The pretesting has determined that the level of arsenic, lead and potentially other constituents largely will exceed levels allowed by the Nebraska Department of Environmental Quality (NDEQ) to be beneficially reused as fill in residential areas. However the levels of arsenic, lead and potentially other constituents identified as part of the pretesting would likely allow the material to be beneficially reused as fill at an industrial site.

In addition the on-site representative will review the excavation of the soils to verify that the material being removed meets the requirements outlined for beneficial reuse material. Material not meeting the requirements for beneficial reuse material but considered to be construction and

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demolition waste material shall be separated and stockpiled separately.

The Contractor's bid for the Excavation for Beneficial Reuse Soils shall be based upon the loading, hauling, and management in accordance with the Special Provision for the North 48th Street Solid Waste Facility Beneficial Soils and Construction and Demolition Waste Material Requirements including but not limited to providing the necessary erosion and sediment controls, SWPPP compliance, dust control and all other items incidental to the work as outlined in these Special Provisions.

If the environmental team representative determines that the unsuitable material being removed differs from the samples previously tested at the site, than the Contractor will be directed to temporarily stockpile the excavated material on site for further testing. Based upon the results of the testing the Contractor shall be directed by the West Haymarket Environmental Team on the location where the soils can be placed off site. The work associated with temporarily stockpiling and reloading the material for removal of the unsuitable material shall be considered an "Extra Work" item and additional compensation will be considered, subject to the approval of the Engineer. In addition if the material is determined to be "Special Waste" and it may not be placed at the North 48th Street Solid Waste Facility then the work associated with the removal and disposal of the Special Waste from the West Haymarket site shall be considered an "Extra Cost". No stockpiled soil shall be removed from the site without prior approval of the West Haymarket Environmental Team.

Measurement for payment of the beneficial reuse soils shall be the calculated volume based upon the areas shown in the plan cross sections as modified by the Engineer based upon conditions encountered in the field. Payment for excavation of beneficial reuse soils including hauling, managing and placing of the soils at the North 48th Street Solid Waste Facility shall be made at the contract unit price bid per cubic yard for the pay item "Excavation for Beneficial Reuse Soils". This payment shall be full compensation for excavation, loading, hauling, compliance with all requirements outlined in the Special Provision for the North 48th Street Solid Waste Facility Beneficial Soils and Construction and Demolition Waste Material Requirements including providing the necessary erosion and sediment controls, construction and maintenance of existing access roads, SWPPP compliance, dust control and all other items as outlined in these Special Provisions for work to be completed at the North 48th Street Solid Waste Facility.

Direct payment for managing, grading and placement of the beneficial reuse soils shall be made as outlined in this Special Provision.

Excavation of Construction and Demolition Waste

During the excavation work at the West Haymarket site, those soils that do not meet the requirements for beneficial reuse soils due to the inclusion of construction and demolition waste shall be separated from the beneficial reuse soils and disposed of at the North 48th Solid Waste Facility Construction and Demolition Waste site. The Contractor will be required to enter the site using the North 48th Street entrance and all loads shall be scaled to determine the weight of the material. The Contractor shall be required to pay all fees associated with disposal of construction and demolition waste.

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Payment for excavation of soils that do not meet the requirements for beneficial reuse soils but is considered Construction and Demolition Waste material shall be made at the contract unit price bid per cubic yard for the pay item "Excavation of Construction and Demolition Waste". This payment shall be full compensation for excavation, loading, hauling, disposal fees and unloading of the material at the North 48th Street Solid Waste Facility in compliance with all requirements for work at the North 48th Street Solid Waste Facility as outlined in the Project Special Provisions.

Over-excavation

The over-excavation item shall include the removal, reworking and re-compaction of existing subgrade soils to the required densities and moisture content as stipulated in the Geotechnical Reports. This work shall include drying of the existing subgrade material or possibly application of water to obtain the required moisture content that is required to achieve proper compaction as outlined in the Geotechnical Reports.

The over-excavation of existing fill materials in some areas will extend to within 1.0 feet of the water table or below. The bottoms of these excavations may require dewatering and dewatering for over-excavation work will be paid for directly as outlined in the Dewatering Special Provision. In addition the bottom of the over-excavation areas might also become disturbed by repeated passes of construction equipment during the excavating operations if groundwater conditions are high. To prevent excessive disturbance, the final one to two feet of materials in the excavation may need to be removed with track-type equipment instead of rubber-tired equipment.

The quantity of over-excavated material is an established quantity based upon the site cross sections shown in the plans. Additional areas that may require over-excavation, as determined by the Engineer, shall be surveyed and measured in the field. Payment for over-excavation shall be made at the contract unit price bid per cubic yard for the pay item "Over-excavation". This payment shall be full compensation for excavation, reworking the material as necessary to obtain proper moisture content, providing water or drying of the soils as necessary for compaction, and compaction of the over-excavated material as directed by the Engineer to provide a uniform compacted subgrade section below the future building pad sites and roadways as shown on the plans.

Earthwork Measured as Embankment

Earthwork Measured as Embankment quantity shall include the construction of the fills and embankment on the project with Contractor furnished off-site borrow. This shall include borrow material, loading, hauling, placement and compaction of the fill material to construct the embankments to the lines and grades shown on the plans. Construction of the fills and embankments shall be completed in accordance with the requirements outlined in the Geotechnical Reports. This pay item shall also include all grading work associated with construction of the swales and rough grading for the sediment basins as shown on the plans. The Contractor shall furnish samples of the borrow material to be used for the fill material on this project to the Engineer for approval prior to start of the work.

Measurement for Earthwork Measured in Embankment is an established quantity based upon the

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lines and grades shown on the cross sections and the grading plan for the project. The quantities for Earthwork Measured in Embankment has been established based upon the cross sections with no balance factor applied (final compacted in-place volume).

Payment for Earthwork Measured in Embankment shall be made at the contract unit price bid per cubic yard for the pay item "Earthwork Measured in Embankment". Such payment shall be full compensation for furnishing, loading, hauling and placement of off-site cohesive borrow to the lines and grades shown on the plans including all necessary working of the material to obtain proper moisture content, providing water or drying of the soils as necessary for compaction, and compaction of the fill material as directed by the Engineer to provide a uniform compacted embankment in accordance with the recommendations outlined in the Geotechnical Reports. All cohesive borrow material to be used in the construction of the fills and embankments shall meet the requirements outlined in the Geotechnical Reports. The Contractor shall furnish samples of the soil to be used for the cohesive borrow material to the Engineer for approval prior to start of the work.

Stockpiled Soils Reused in Embankment

Stockpiled soils have been removed as part of the BNSF railroad track grading project and the locations of the stockpiles are as shown on the plans. The existing stockpiled soils have generally been determined to be suitable for reuse as fill material at the West Haymarket site for fill areas and embankment construction up to 3.0 feet below the finished top of embankment elevations shown on the plans. The stockpiled soils reused in the fills and embankments may be placed at elevations lower than 1153.0 at the pad site underneath the arena and DEC site (as defined by a line approximately 15'-0" inside the full height of the surcharged area on the plans) and 1150.0 at all other locations.

Based upon geotechnical testing of the existing stockpiled soils, the moisture content of the soils is generally above the maximum moisture content allowed and reworking of the material will be required to dry the soils to the proper moisture content needed for compaction. It is anticipated that some of the existing stockpiled soil may not be suitable for reuse and may need to be disposed of or beneficially reused at a location off site as determined by the Engineer. Existing stockpiled soils to be disposed of off-site shall be paid for directly as outlined later in this Special Provision. Refer to the Geotechnical Report for further information on the existing stockpiled soils.

In addition to reworking the stockpiled material to attain the proper moisture content, the Contractor shall also be responsible for removal of any rubble or other unsuitable materials prior to placement and compaction of the soils as stipulated in the Geotechnical Reports.

For the purpose of determining quantities for the reuse of the stockpiled soils in the new embankment it is estimated that 80% of the existing stockpiled material will be reused in the construction of the embankment and 20% will be hauled off-site for beneficial reuse soils to be placed at the North 48th Street Solid Waste Facility. To determine the in-place volume of fills and embankment constructed with the reused stockpiled soils, a compaction factor of 1.35 was applied to the volume of the stockpiled soils.

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Stockpiled soils reused in the construction of the fills and embankments on the project shall be measured based upon the volume of soil removed from the existing stockpiled and placed in the new embankments. This will be determined by survey cross sectioning of the stockpiles prior to the start of construction and upon completion of the work. Stockpiled material that cannot be reused will be separated and cross sectioned separately to determine the volume.

Payment for stockpiled soils reused in the construction of the fills and embankments shall be made at the contract unit price bid per cubic yard for the pay item "Stockpiled Soils Reused in Embankments". Such payment shall be full compensation for loading, hauling, reworking, drying, removal of unsuitable materials, placement and compaction of the stockpiled materials to construct the new fills and embankments to the lines and grades shown on the plans as directed by the Engineer to provide a uniform compacted embankment in accordance with the recommendations outlined in the Geotechnical Reports.

Surcharge Embankment

The Contractor shall provide suitable cohesive borrow material to construct the surcharge embankments to the lines and grades shown on the plans to expedite consolidation of the underlying soils and fill material. Surcharge embankments shall be constructed at the arena site and at the District Energy Corp. site as shown on the plans. The Contractor shall plan on using the removed surcharge material in the construction of the fills and embankments at the areas to the south of "R" Street during Phase II construction of the project. The Contractor shall furnish samples of the soil to be used for the surcharge to the Engineer for approval prior to start of the work. Surcharge material shall not be removed without prior written approval from the Engineer.

Measurement for surcharge material shall be based upon the plan cross sections and is an established quantity. Payment for furnishing, placement, and shaping of cohesive material used in the construction of the surcharge embankments shall be made in accordance with the contract unit price bid per cubic yard for the pay item "Surcharge Embankment". Said payment shall be full compensation for furnishing all labor, equipment, and materials required to truck dump and shape the surcharge material to the lines and grades shown on the plans and cross sections. Removal of surcharge material to be used in the construction of the fills and embankment at the area to the south of "R" Street shall be paid for directly.

Surcharge Removal and Reuse in Phase II Embankment

The Contractor shall remove the proposed surcharge materials and use this material in the construction of the fills and embankments at the areas to the south of "R" Street during Phase II construction of the project. This work shall include all necessary work associated with removal of the surcharge material, final shaping of the embankment where the surcharged material is removed to provide the final lines and grades shown on the plans, hauling, and placement of the material to construct the fills and embankments for the Phase II portion of the project including all necessary working of the material to obtain proper moisture content, providing water or drying of the soils as necessary for compaction, and compaction of the material to provide a uniform compacted embankment in accordance with the recommendations outlined in the Geotechnical Reports.

Measurement for surcharge material removed and used in construction of the Phase II fills and

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embankments shall be based upon the plan cross sections and is an established quantity. Payment for removal, hauling and placement, and compaction of the removed surcharge material at the Phase II fills and embankments shall be made in accordance with the contract unit price bid per cubic yard for the pay item "Surcharge Removal and Reuse in Phase II Embankment". Said payment shall be full compensation for furnishing all labor, equipment, and materials required to remove, haul, place and compact the removed surcharge material at the Phase II fills and embankments to the lines and grades shown on the plans and in accordance with the recommendations of the Geotechnical Reports.

To determine the in-place volume of fills and embankment constructed with the reused surcharged soils, a compaction factor of 1.30 was applied to the volume of the surcharged material that is to be removed and reused at the Phase II fills and embankments.

Stockpiled Soils for Beneficial Reuse

Stockpiled soils that are not reused in the construction of the new fills and embankments on this project and which meet the requirements outlined in these Special Provisions for beneficial reuse soils shall be hauled to the North 48th Street Solid Waste Facility for beneficial reuse. The on-site representative will review the stockpiled soils that are used in the construction of the new fills and embankments to verify that the material meets the requirements outlined for beneficial reuse material. Material not meeting the requirements for beneficial reuse material but considered to be construction and demolition waste material shall be separated and stockpiled separately.

The Contractor's bid for the stockpiled soils for beneficial reuse shall be based upon the loading, hauling, compliance with all requirements outlined in the Special Provision for the North 48th Street Solid Waste Facility Beneficial Soils and Construction and Demolition Waste Material Requirements including providing the necessary erosion and sediment controls, construction and maintenance of existing access roads, SWPPP compliance, dust control and all other items as outlined in these Special Provisions for work to be completed at the North 48th Street Solid Waste Facility.

If the environmental team representative determines that the unsuitable material being removed differs from the samples previously tested at the site, than the Contractor will be directed to temporarily stockpile the excavated material on site for further testing. Based upon the results of the testing the Contractor shall be directed by the West Haymarket Environmental Team on the location where the soils can be placed off site. The work associated with temporarily stockpiling and reloading the material for removal of the unsuitable material shall be considered an "Extra Work" item and additional compensation will be considered, subject to the approval of the Engineer. In addition if the material is determined to be "Special Waste" and it may not be placed at the North 48th Street Solid Waste Facility then the work associated with the removal and disposal of the Special Waste from the West Haymarket site shall be considered an "Extra Cost". No stockpiled soil shall be removed from the site without prior approval of the West Haymarket Environmental Team.

Measurement for stockpiled soils for beneficial reuse shall be based upon field cross sections of the stockpiles before and after the soils have been hauled off site to the North 48th Street Solid

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Waste Facility. Payment for stockpiled soils for beneficial reuse at the North 48th Street Solid Waste Facility shall be made at the contract unit price bid per cubic yard for the pay item "Stockpiled Soils for Beneficial Reuse". This payment shall be full compensation for excavation, loading, hauling and unloading of the material at the North 48th Street Solid Waste Facility in compliance with all requirements for work at the North 48th Street Solid Waste Facility as outlined in these Special Provisions and in compliance with all requirements of the SWPPP for the North 48th Street Solid Waste Facility.

Direct payment for managing, grading and placement of the beneficial reuse soils shall be made as outlined in this Special Provision.

Stockpiled Soils, Construction and Demolition Waste

During the work associated with removing the existing stockpiled soils for use in the construction of the new fills and embankment or beneficial reuse, those soils that do not meet the requirements for beneficial reuse due to the inclusion of construction and demolition waste shall be separated from the beneficial reuse material and disposed of at the North 48th Solid Waste Facility Construction and Demolition Waste site. The Contractor will be required to enter the site using the North 48th Street entrance and all loads shall be scaled to determine the weight of the material. The Contractor shall be required to pay all fees associated with disposal of construction and demolition waste.

Payment for stockpiled soils that do not meet the requirements for beneficial reuse material but is considered Construction and Demolition Waste material shall be made at the contract unit price bid per cubic yard for the pay item "Stockpiled Soils, Construction and Demolition Waste". This payment shall be full compensation for excavation, loading, hauling, disposal fees and unloading of the material at the North 48th Street Solid Waste Facility in compliance with all requirements for work at the North 48th Street Solid Waste Facility as outlined in the Project Special Provisions.

Grading and Placement of Beneficial Reuse Soils

The Contractor shall place and grade the beneficial reuse soils at the location shown on the North 48th Street Solid Waste Facility Location Map to conform to the proposed grading plan that has been developed by the City and the requirements outlined in the Special Provision for the North 48th Street Solid Waste Facility Beneficial Soils and Construction and Demolition Waste Materials Requirements and the SWPPP for the North 48th Street site.

Measurement for grading and placement of beneficial reuse soils shall be made at the West Haymarket site prior to hauling the material to the North 48th Street Solid Waste Facility. Payment for management, placement and grading of the soil in accordance with the requirements outlined in these Special Provisions shall be made at the fixed contract unit price of $1.25 per cubic yard. Beneficial fill material excavated and not delivered and placed at the North 48th Street Solid Facility will not receive the $1.25 payment for placement and grading of the beneficial reuse soils.

Subgrade Stabilization

It is anticipated that a portion of the subgrade area for the over-excavation work will need to be stabilized in order to complete the over-excavation work in accordance with the requirements

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outlined in the Geotechnical Reports. Several alternatives are provided in the Geotechnical Report for the subgrade stabilization. The Contractor shall base their bid on providing subgrade stabilization in accordance with the requirements outlined in the Geotechnical Report for "Stabilizing with a Geotextile and Granular Materials".

Approved geotextiles as outlined in the Geotechnical Reports for use in subgrade stabilization shall be measured and paid for by the square yard at the contract unit price bid for the pay item "Geotextile for Subgrade Stabilization". Granular Material for subgrade stabilization shall be measured and paid for by the ton at the contract unit price bid for the pay item "Granular Material for Subgrade Stabilization". Such payment for the geotextile and granular material shall be full compensation for the work required to stabilize the subgrade in accordance with the requirements outlined in the Geotechnical Report for "Stabilizing with a Geotextile and Granular Materials.

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NORTH 48TH STREET SOLID WASTE FACILITY

BENEFICIAL SOILS AND CONSTRUCTION AND DEMOLITION WASTE MATERIALS REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Site and Job Conditions
   2. Site Preparation
   3. Site Earthwork delivery, placement and filling requirements
   4. Environmental Controls
   5. Soil Erosion and Sediment Control.

B. B. Related Sections include but are not necessarily limited to:
   1. General Contract Requirements
   2. Technical Provisions
   3. Special Provisions to City Standard Specifications for Municipal Construction

1.2 N. 48TH STREET SITE ACTIVITIES

A. The site for placement of Beneficial Soils filling and disposal of acceptable Construction & Demolition (C&D) waste is shown on Exhibit 'A' to this specification.
   1. Within the City's N. 48th Street Site there are several functional areas including those which will receive the Beneficial Soils and the C&D waste.
      a. Those areas include C&D landfill, maintenance building, scale house, transfer station, brush and compost area, appliance demanufacturing area, and supporting roadway networks.
   2. Both areas to receive material from the Project are located on top of historic municipal solid waste disposal areas; one is a closed area (Landfill West) which is will utilize clean soil as Compacted Fill for beneficial use in improving site grades and drainage and the other is the City's current C&D waste disposal landfill.
      a. The use of the City's N. 48th Street site must be done in such a manner as to not interfere with other site activities.
   3. The C&D facility is regulated by the State of Nebraska, under Title 132 Regulations.
      a. Place all designated C&D waste in areas designated by the City as the active C&D disposal area.
      b. The City will undertake all landfilling and final movement and disposal operations of the C&D disposal area.

1.3 JOB CONDITIONS

A. Contractor shall take appropriate measures and employ the use of appropriate equipment to conduct Beneficial Soil filling operations in a safe manner that takes into account the types of waste and the by-products thereof that could be present.
   1. By-products may include, but are not necessarily limited to solid waste, landfill decomposition gases, and leachate.

B. Site Access.
   1. Beneficial Soils fill areas.
      a. When delivering Beneficial Soils Contractor shall use the N. 56 th St. and Fletcher Ave. entrance to the site and the designated on-site roadways to gain access to the designated Beneficial Soils fill area identified on Exhibit A attached to the Special Provisions.
   2. Construction and Demolition Waste Materials and Soils

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a. All C&D waste shall enter the site through the solid waste facilities entrance at N. 48th Street.
   1) All vehicles delivering C&D waste shall be weighed upon entering and exiting
   2) C&D waste materials will be charged $4.00 per ton.

C. Smoking within the Beneficial Soils and C&D waste filling area(s) will not be permitted.
   1. Contractor may establish permitted smoking areas in the Contractor field office or other City/JPA approved areas, provided adequate measures are employed to prevent landfill gas accumulation.
   2. Submit schedule of permitted smoking areas for City/JPA approval.

D. Special Considerations:
   1. Contractor shall follow the requirements of OSHA or USEPA/NDEQ or other applicable regulations when conducting operations associated with rough grading and waste disturbance at the Beneficial Soils fill area.
   2. Personal protective equipment:
      a. Determination of the appropriate level of personal protective equipment and procedures shall be made by the Contractor as a result of Contractor's site assessment, review of existing data, and a continued safety and health monitoring program performed by the Contractor's Site Safety Officer for the Project.
   3. Equipment decontamination:
      a. All vehicles and equipment entering the limits of the site and contacting potentially hazardous materials shall be cleaned and/or decontaminated prior to leaving the site.
         1) The Contractor shall be responsible for monitoring all vehicle equipment, decontamination and activity.
         2) Decontamination area and fluid management procedure shall be the responsibility of the Contractor and identified by the Contractor at the Pre-Construction Meeting.
   4. Construction at the N. 48th Street Site will require special precautions because of the conditions that exist in this type of landfill environment.
      a. These conditions include:
         1) The possible presence of potentially explosive and harmful gases resulting from decomposition of organic waste and other substances.
         2) The presence of leachate, which is a liquid which emanates from a landfill solid waste deposits.
         3) The fill and disposal areas are located above solid waste of unknown quantities and composition.
      b. Contractor is advised that landfill gases including varying concentrations of methane and hydrogen sulfide gas are known to be present within the landfill areas.
         1) Such gases resulting from decomposition of organic and other substances are explosive in certain concentrations and represent a hazard to life under certain conditions including but not limited to confined areas.
         2) Contractor shall provide and is responsible for conducting any monitoring required to determine the presence, composition, and concentration of gases present in order to evaluate hazard potential and take appropriate safety measures which may include, but not be limited to, special ventilation, breathing apparatus and protective clothing for employees or subcontractors, explosion-proof and non- sparking equipment, and fire protection.
         3) Contractor shall be responsible for the methods used and precautions taken while performing the Work at this site to insure the safety of personnel and of other persons and operations at the landfill resulting from the Work at the designated filling locations.

E. Hours of Site Access
   1. The N. 48th Street site is open for public use, related to solid waste operations, as follows:
      a. During Daylight Savings Time:

Monday to Friday	6:45 a.m. - 6:00 p.m.
Saturday	6:45 a.m. – 3:00 p.m.
Sunday	6:45 a.m. - Noon.

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b. During other times of the year:

Monday to Friday	6:45 a.m. – 4:15 p.m.
Saturday	6:45 a.m. - 3:00 p.m.
Sunday	6:45 a.m. - Noon.

2. Site is staffed seven (7) days a week during all hours open to the public.
   a. The Site is closed on the following holidays: Memorial Day, July 4, Labor Day, Thanksgiving, the day after Christmas and the day after New Year's Day.
3. Site access beyond normal public use hours.
   a. If access is required beyond the public use hours the Contractor must inform the City/JPA designated representative of the required hours of access and must make arrangements with the City/JPA to obtain such access.
4. If the Contractor is present on site during non-staffed hours, the Contractor must maintain the site secured from unauthorized access.

F. Access To On-site Water
1. The Contractor may utilize water from the on-site City water supply at no cost to the Contractor.
   a. On-site water supply is defined as the hydrant near the existing solid waste transfer station.
   b. All other hydrants and water supplies on and off-site will require City/JPA approval and Contractor shall pay for all water removed from these alternate sources.
2. No water should be obtained from on-site wells.
3. The City/JPA reserves rights of first access to the water supply for conducting site and waste management related activities.
4. Provide backflow preventer as per City standard specifications requirements and regulations.

1.4 DEFINITIONS

A. Base Grade: Top elevation of the existing landfill cover soil upon which Beneficial Soils will be placed and compacted.

B. Compacted Fill: Compacted Beneficial Soil fill above Base Grade and at or below final grade contours shown on N. 48th Street Beneficial Fill Grading Plan.

C. Beneficial Soil: Excavated soil from specified areas of the West Haymarket Project area and existing stockpiled soils, as designated by the JPA's Engineer or designated representative to be suitable for use as Beneficial Soil.

D. Project: West Haymarket Joint Public Agency (2011), Haymarket Infrastructure Improvements, Initial Haymarket Site Preparation, Project No. 870703.

1.5 SUBMITTALS

A. Shop Drawings
1. See specific paragraphs in this section, General Contract Documents, Special and Technical Provisions of this Project for submittal requirements
2. Specific Product technical data including:
   a. Acknowledgement that materials submitted meet requirements of the specifications, provisions and standards referenced.
   b. Manufacturer's installation instructions and proposed details, if different from the Contract Documents.
3. Proposed earthwork and soils moving, placement, processing and compaction equipment, sequence of filling plans and schedule.
   a. Submit before starting Work, including delivery and placement of Beneficial Soils.
   b. Identify access roads for City/JPA approval.
4. Traffic Control Plan
5. Erosion and Sediment Control Plan:
   a. A detailed plan showing all methods of control and preventive measures to be utilized for environmental protection.

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b. Submittal and approval is required prior to the start of any Beneficial Soils filling operations; no plan is required for C&D disposal in the C&D landfill area.
c. A drawing of the work area, storage areas, and access roads.
1) Identify all required traffic control plans and measures.

6. Schedule of permitted smoking areas for City/JPA approval

PART 2 - PRODUCTS

2.1 MATERIALS - SEDIMENT AND EROSION CONTROL

A. Silt Fence Fabric:
1. A woven geotextile fabric meeting the City of Lincoln Standard Specifications, Chapter 32, Part 32.02.B. for High Strength Fabric Properties.
a. Steel T-posts.

PART 3 - EXECUTION

3.1 ENVIRONMENTAL PROTECTION AND SPECIAL CONTROLS

A. General:
1. The Contractor is responsible for supplemental environmental protection and special controls for the access roads, Beneficial Soils fill areas, and other site areas, as needed.
2. Contractor's responsibility extends through the completion of the filling operations

B. Employ and utilize environmental protection methods, obtain all necessary permits, and fully observe all local, state, and federal regulations.
1. The Contractor shall work under an NPDES (Stormwater) Permit obtained by the City.
2. The Contractor shall comply with the Storm Water Pollution Prevention Plan (SWPPP) For Construction Activities at the North 48th Street site, prepared by the City.
a. City has prepared a SWPPP in compliance with local laws and regulations.
b. A copy of the SWPPP will be provided to the Contractor
1) The most current version of the NPDES permit and SWPPP are also available for review at the office of the Superintendent of Solid Waste Operations office at 6001 Bluff Road, Lincoln, NE; Phone: (402) 441-7867.

C. SWPPP - General Content:
1. Minimum SWPPP best management practices locations as applicable to the Beneficial Soils fill areas shown on Exhibit 'A'.
2. Silt Fence will be constructed around the downstream perimeter of the areas to receive Beneficial Soils prior to the grading operation beginning.
3. All storm ditches, culverts and inlets adjacent to the Beneficial Soils filling and soil haul road will also be protected to prevent erosion and sediment from leaving the site.
4. All Beneficial Soil construction related areas will be protected by controls such that no sediment is allowed to discharge without passing a control system.
5. Controls shall be installed prior to the beginning of site preparation, soil hauling and filling operations, to the greatest extent possible.
6. The Contractor will be required to acknowledge compliance with and sign the SWPPP.
a. The plan is considered a living document and must be amended if changes in construction require control measures not otherwise provided by the plan.

D. All erosion and sediment control practices shall be maintained in accordance with the requirements specified in the Lower Platte South Natural Resources District Manual of Erosion and Sediment Control and Storm Water Management Standards, dated 1994, approved supplements and City of Lincoln Standard Plans.

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E. Land Protection:
   1. Except for any work or storage area and access roads specifically assigned for the use of the Contractor, the land areas outside the established limits of construction shall be preserved in their present condition.
      a. Contractor shall confine Beneficial Soils filling and C&D disposal activities to areas shown on the Grading and Placement Drawings, Exhibit 'A', attached to these Special Provisions and defined for Work within the Contract Documents.
      b. Construction and maintenance of access roads which will result in land disturbance shall be identified and be submitted for City/JPA approval prior to construction.
   2. Manage and control all soil fill or stockpile areas, work or storage areas, access roads and embankments to prevent sediment from entering nearby water or land adjacent to the Work site.
   3. Protect all grades, side slopes and backslopes immediately upon completion of final grading.
   4. Plan and execute earthwork in a manner to minimize environmental releases.
   5. The Contractor shall not deface, injure or destroy trees and vegetation, nor remove, cut, or disturb them without approval of the City/JPA.
   6. Any damage caused by the Contractor's equipment or operations outside the areas designated shall be restored as nearly as possible to its original condition at the Contractor's expense.

F. Surface Water Protection:
   1. Utilize and construct, as necessary, additional erosion control methods to protect side and backslopes, minimize and the discharge of sediment to the surface water leaving the Beneficial Soils fill construction site.
      a. Physically retard the rate and volume of run-on and runoff by implementing any required structural practices such as diversion swales, terraces, straw bales, rock checks, silt fences, filter socks, and berms.
      b. Provide and maintain construction sites with graveled or rocked access entrance and exit drives and parking areas to reduce the tracking of sediment onto public or private roads.
   2. Maintain erosion control measures immediately adjacent to the Beneficial Soils fill site for the duration of construction.
      a. These controls shall be maintained until completion of the work on the N. 48th Street site, or until they are no longer warranted and concurrence is received from the City/JPA or Engineer.
   3. Discharges from the construction site shall not contain pollutants at concentrations that produce objectionable films, colors, turbidity, deposits or noxious odors in the receiving stream or waterway.

G. Erosion Protection:
   1. Utilize methods necessary to effectively prevent erosion and control of sedimentation and include the following:
      a. Retardation: Physically retard rate of runoff by construction of diversion ditches, terraces, and berms.
         1) Divert run-off to protect drainage courses.
      b. Remove temporary protection installed by Contractor after final grading operations except as specified elsewhere in these specifications.

H. Solid Waste Disposal:
   1. Collect solid waste resulting from activities on the N.48th Street site on a daily basis.
   2. Provide disposal of solid waste by using the small vehicle transfer station at the site.

I. Control Chemical Waste:
   1. Store and dispose of chemical wastes in a manner approved by regulatory agencies.
   2. Take special measures to prevent chemicals, fuels, oils, oil filters, greases, herbicides, and insecticides from being disposed of, spilled or entering drainage ways.
   3. Do not allow water used in onsite material processing, concrete curing, cleanup, and other waste waters to enter a drainage way(s) or stream.
   4. The Contractor shall provide containment around fueling and chemical storage areas to ensure that spills in these areas do not reach waters of the state.

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a. Spilled material and resulting contaminated soils shall be removed and disposed of in accordance with regulatory guidance.

5. Contractor to pay all regulatory and City/JPA incurred costs resulting from improper discharges and corrective actions.

J. Control of Dust:
1. The control of dust shall mean that no construction activity shall take place without applying all such reasonable measures as may be required to prevent particulate matter from becoming airborne so that it remains visible beyond the limits of construction.
   a. Reasonable measures may include application of water or application of City/JPA approved chemical dust suppressants.
      1) Chemical suppressants subject to written City/JPA approval.
2. Utilize methods and practices of construction to eliminate dust in full observance of agency regulations.
3. The City/JPA, Engineer or designated representative will determine the effectiveness of the dust control program and may request the Contractor to provide additional measures, at no additional cost to City/JPA.
   a. No visible emissions are permitted at the property boundary.

K. Burning:
1. Do not burn material on the site.
   a. If the Contractor elects to dispose of waste materials by burning, make arrangements for an off-site burning area and conform to all applicable regulations.

L. Control of Noise:
1. Control noise by fitting equipment with appropriate mufflers.

M. Equipment Maintenance:
1. Waste oils, fuels, lubricants and filters shall be contained and removed from site.
2. Disposal at the on-site landfill is not allowed.

N. Traffic Control:
1. Traffic Control Plan is subject to City/JPA approval and shall include as a minimum:
   a. Haul roads to and from any off-site borrow areas.
   b. Access points on to the N. 48th Street site.
   c. Construction traffic signs the Contractor will utilize, including location (Stop Signs).
   d. Verification that the Traffic Control Plan meets City/JPA and NDOR requirements.
      1) Provide evidence of City/JPA approval of traffic control plan and any required traffic control devices along N. 56th Street.
2. Implement all necessary control measures.
   a. Repair all damage as a result of traffic and traffic crossing.
   b. The Contractor shall observe all traffic controls within the site.
      1) Where not posted, vehicle speeds shall not exceed 25 mph on all on site access roads.

O. Completion of Work at N. 48th Street Site:
1. Upon completion of work, leave area in a clean, natural looking condition.
2. Ensure all signs of temporary construction and activities incidental to construction of required permanent work are removed.
3. Grade to provide positive drainage and avoid ponding of all disturbed areas.
4. Remove temporary soil erosion and sediment control features, unless City/JPA specifically allows them to remain.

3.2 SOIL EROSION AND SEDIMENT CONTROL

A. Preparation
1. Identify locations where additional erosion protection is necessary

B. Installation

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1. Install all necessary erosion and sediment controls in accordance with manufacturer's specifications or local municipal standards.
2. Silt Fence will be constructed around the downstream perimeter of the areas to receive Beneficial Soils prior to the grading operation beginning.

C. During Construction Filling Period
1. Maintain silt fence and erosion controls:
   a. Inspect weekly.
   b. Inspect after each rainstorm.
   c. Repair or replace damaged or missing items.
   d. Comply with SWPPP frequency requirements.
2. Install additional silt fence and erosion controls as necessary as part of erosion protection.
3. Remove sediment from behind silt fences or erosion controls to prevent overtopping.
   a. Remove sediment at completion of filling operations.
   b. Sediment trapped by this practice shall be deposited at a location on-site approved by the City/JPA.

D. Near Completion of Construction of Beneficial Soils.
1. Grade to finished or existing grades or as required to ensure positive drainage.
2. Grade drainage ways and remaining earth areas to drain.
3. Remove sediment from culverts that were impacted by construction.
4. If requested by City/JPA, remove silt and restore ground to existing conditions.
5. If requested by City/JPA, temporary silt fence or erosion controls shall be removed when such controls have served designated purpose so as not to block or impede storm flow or drainage.

3.3 SITE PREPARATION – BENEFICIAL SOILS AREA:

A. Construction Staking and Surveying
1. Construction Staking and Surveying required for the grading and placement of the beneficial soils shall be provided by the Contractor as per the City of Lincoln Standard Specifications. This shall be considered subsidiary to the cost of excavating and hauling the beneficial soils.

B. Clearing and grubbing:
1. Clear from within limits of Beneficial Soil fill construction all trees, brush, dead wood, stumps and organic matter. This shall be considered subsidiary to the cost of excavating and hauling the beneficial soils.
   a. Grassing may be incorporated into the Rough Grading surface to develop Base Grade.
2. Grub (remove) from within limits of construction all timber, stumps, roots, root mats, and debris encountered.
3. Grubbed items can be disposed of at the brush chipping area on site.

C. Grade on-site soils and topsoils within limits of Beneficial Soil fill construction to develop a smooth and uniform surface (Base Grade) prior to placement of Beneficial Soils.
1. Cut off mounds and ridges.
2. Fill gullies and depressions.
3. Remove heavy growths of grass before moving soils.
4. Exercise care to avoid the disturbance of solid waste.
5. Compact to same requirements as Compacted Fill.
6. Construct to freely drain surface water.

D. Disposal of Waste Materials:
1. Reincorporate any incidental solid waste encountered into rough grading within Beneficial Soil fill area.
2. Maintain at least 12 inches of soil cover over the existing solid waste at all times.

E. Protect existing surface and subsurface features on-site and adjacent to fill sites as follows:
1. Provide barricades, coverings, or other types of protection necessary to prevent damage to existing items indicated to remain in place.
   a. Do not access these areas without written approval of the City/JPA.

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2. Protect and maintain bench marks, monuments or other established reference points and property corners.
   a. If disturbed or destroyed, replace to full satisfaction of City/JPA and controlling agency at no additional cost to City/JPA.
3. Maintain free of damage, existing culverts, roadways, fence, gates, hydrants, structures and pavement.
   a. Any item known or unknown or not properly located that is inadvertently damaged shall be repaired to original condition.
   b. All repairs to be made and paid for by Contractor.
4. Provide full access to public and private premises, the landfill, maintenance building, scale house, transfer station, road crossings and other points as designated by City/JPA to prevent serious interruption of travel.
5. Use City/JPA designated access and on-site haul roads where possible.

3.4 EARTHWORK

A. The earthwork includes all operations in connection with placement and construction of Beneficial Soil compacted fills and embankments .
   1. Contractor is responsible for maintenance and repair of existing onsite roads used by Contractor during the performance of the Beneficial Soils delivery and placement work.
      a. Restore to pre-project conditions.
   2. Contractor is responsible for construction, maintenance and repair of additional haul and access roads from existing onsite roadways required for performance of the Beneficial Soils delivery and placement work.

B. Protection of Finish Grade:
   1. During construction of Beneficial Soils delivery and placement work, shape and drain embankment to design slopes.
   2. Maintain ditches and letdowns to provide drainage at all times.
   3. Protect graded areas against action of elements.
   4. Re-establish grade where settlement or erosion occurs at no additional cost.

C. Grading:
   1. Perform as required by the N. 48th Street Beneficial Fill Grading Plan drawings.
   2. Contract drawings may indicate both existing grade and finished grade required for placement of fills.
   3. Do not excavate below Base Grade prior to construction and placement of fills.
   4. Construct Compacted Fills using approved Project soils and compact to density requirements indicated in this Specification.

D. Field Quality Control
   1. Moisture-density relationships (compaction curves), per ASTM D698, are to be established by the JPA's soil testing program for all soil materials to be compacted.
      a. These values will be established and reported to the Contractor prior to the start of placement.
   2. JPA's representative will perform in-place moisture-density tests after soils have been placed and compacted.
      a. Contractor to pay for all failing tests
   3. Any soils which fail to meet specification moisture-density test requirements (defined as failure) will require corrective action.
      a. Corrective action shall include necessary excavation of failed area, reprocessing, moisture adjustment, refilling and recompaction at no cost to the JPA.

E. Material Placement
   1. Compacted Fill soils shall be placed in the following lift thicknesses:
      a. 12 IN maximum compacted thickness or less as required to achieve density and produce total finished thickness.
      b. Do not place material that is excessively wet and can not be compacted to specified density

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2. Place lifts horizontally and compact each layer to the required thickness and density prior to placing additional fill.
3. Compaction density: 90 percent, ASTM D698.
4. Compact by using sheepsfoot-style soil compactors or by other equipment as required to obtain specified density for full thickness of lift.
5. Ensure that each layer of the Compacted Fill is fully bonded to adjoining layers.
   a. Between lifts of one soil material, this may be accomplished with compaction equipment; by disking between adjoining layers; or by other demonstrated methods.

F. Acceptance
1. Provide JPA or Engineer written notification seven (7) days prior to need for Compacted Fill surveying for grade confirmation.
2. The JPA will survey to confirm proper grades and layer thicknesses.
   a. Contractor will pay costs of resurveying for defective thicknesses.

END OF SECTION

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EARTHWORK SUMMARY TABLE

	LOCATION	EXCAVATION FOR BENEFICIAL REUSE SOILS (CU. YDS.) NOTES 5 & 6	OVER-EXCAVATION (CU. YDS.) NOTES 2 & 6	EARTHWORK MEASURED IN EMBANKMENT (CU. YDS.) NOTES 1, 2 & 3	EMBANKMENT SURCHARGE (CU. YDS.) NOTE 1	STOCKPILED SOILS FOR REUSE IN EMBANKMENT (CU. YDS.) NOTE 7	SURCHARGE REMOVAL AND REUSE IN PHASE II EMBANKMENT (CU. YDS.) NOTE 4	STOCKPILED SOILS FOR BENEFICIAL REUSE (CU. YDS.) NOTES 5 & 7
PHASE I EARTHWORK	2107+50.00 to 2118+80.00	11,689	13,559	101,720	–	–	–	–
	2109+30.00 to 2114+30.00	–	–	–	62,149	–	–	–
	1306+28.50 to 1309+06.25	470	–	33	–	–	–	–
	200+00.00 to 208+94.20	545	–	312	–	–	–	–
	OFF-SITE STOCKPILE	–	–	(–56,300)	–	76,000	–	18,500
	PHASE I SUBTOTALS	12,704	13,559	45,765	62,149	76,000	0	18,500
PHASE II EARTHWORK	2095+35.00 to 2108+00.00	31,579	31,355	105,152	–	–	–	–
	2101+00.00 to 2105+50.00	–	–	(–6,874)	8,936	–	8,936	–
	2109+30.00 to 2114+30.00	–	–	(–47,807)		–	62,149	–
	FINAL ACCESS ROAD AND PARKING AREA	–	–	5,600	–	–	–	–
	PHASE II SUBTOTALS	31,579	31,355	56,071	8,936	0	71,085	0
	PROJECT TOTAL	44,283	44,914	101,836	71,085	76,000	71,085	18,500

GENERAL EARTHWORK NOTES:

1. THE QUANTITIES SHOWN FOR "EARTHWORK MEASURED IN EMBANKMENT" AND "EMBANKMENT SURCHARGE" ARE IN-PLACE VOLUMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE APPROPRIATE COMPACTION FACTOR TO USE IN DETERMINING THE FINAL QUANTITIES OF BORROW REQUIRED TO CONSTRUCT THE EMBANKMENTS TO THE LINES AND GRADES SHOWN ON THE PLANS. REFER TO THE GEOTECHNICAL REPORT FOR THE DENSITY REQUIREMENTS FOR FILLS AND EMBANKMENTS.

2. THE "OVER-EXCAVATION" QUANTITY SHOWN IS AN IN-PLACE VOLUME BASED UPON EXISTING SITE CONDITIONS. AN ASSUMED 1.35 COMPACTION FACTOR WAS APPLIED TO THE EXISTING IN-PLACE OVER-EXCAVATION VOLUME TO DETERMINE THE ADDITIONAL "EARTHWORK MEASURED IN EMBANKMENT" QUANTITY NEEDED TO OFFSET THE LOSS IN SOIL VOLUME DUE TO COMPACTION OF THE REWORKED SOILS.

3. THE NEGATIVE NUMBER SHOWN IN THE "EARTHWORK MEASURED IN EMBANKMENT" COLUMN REFLECTS THE IN-PLACE COMPACTED VOLUME OF THE STOCKPILED SOIL REUSED IN EMBANKMENT OR THE SURCHARGE EMBANKMENT THAT HAS BEEN REMOVED AND REUSED IN THE PHASE II EMBANKMENT. THE ASSUMED COMPACTION FACTOR FOR STOCKPILED SOILS REUSED IN EMBANKMENT IS 1.35 AND THE ASSUMED COMPACTION FACTOR FOR THE SURCHARGE SOILS REMOVED AND REUSED IN THE PHASE II EMBANKMENT CONSTRUCTION IS 1.30.

4. EMBANKMENT SURCHARGE SHALL BE USED IN THE CONSTRUCTION OF THE PHASE II EMBANKMENTS.

5. THE CONTRACTOR SHALL HAUL AND PLACE "BENEFICIAL REUSE" SOILS FROM THE EXCAVATIONS AND EXISTING STOCKPILES TO THE CITY OF LINCOLN'S NORTH 48TH STREET SOLID WASTE FACILITY. REFER TO THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.

6. RECOMMENDED DEPTHS FOR "EXCAVATION FOR BENEFICIAL REUSE SOILS" AND "OVER-EXCAVATION" HAVE BEEN DETERMINED BY THE SOIL BORING LOGS. REFER TO THE GEOTECHNICAL REPORTS FOR ADDITIONAL INFORMATION.

7. THE "STOCKPILED SOILS FOR BENEFICIAL REUSE" VOLUME AND THE "STOCKPILED SOILS FOR REUSE IN EMBANKMENT" VOLUME ARE ESTIMATED QUANTITIES. THE FINAL PAY QUANTITIES WILL BE DETERMINED BY CROSS SECTIONING THE STOCKPILE AREA PRIOR TO THE START OF CONSTRUCTION AND AFTER THE HAULING HAS BEEN COMPLETED.

8. A PORTION OF THE EXISTING EXCAVATED SOILS THAT HAVE BEEN DETERMINED TO BE UNSUITABLE FOR FILL AT THE SITE MAY NOT MEET THE REQUIREMENTS FOR "BENEFICIAL REUSE" SOILS DUE TO INCLUSION OF CONSTRUCTION AND DEMOLITION WASTE MATERIAL. AS SUCH, 1,000 CUBIC YARDS OF THIS EXCAVATED VOLUME AS CALCULATED BASED UPON THE CROSS SECTIONS HAS BEEN ASSUMED TO BE CONSIDERED AS CONSTRUCTION AND DEMOLITION WASTE MATERIAL WHICH CANNOT BE USED FOR BENEFICIAL REUSE SOILS. IN ADDITION, 500 CUBIC YARDS OF THE EXISTING STOCKPILED SOILS HAVE BEEN ASSUMED TO NOT MEET THE REQUIREMENTS FOR BENEFICIAL REUSE AND WILL BE CLASSIFIED AS CONSTRUCTION AND DEMOLITION WASTE MATERIALS AS WELL. SEPARATE PAYMENT SHALL BE MADE FOR DISPOSAL OF CONSTRUCTION AND DEMOLITION WASTE MATERIAL.

9. REFER TO THE SPECIAL PROVISIONS AND THE GEOTECHNICAL REPORTS FOR ADDITIONAL REQUIREMENTS.

This document was originally issued and sealed by Thomas A. Leiksen, E-6290, on 4-8-11. This media should not be considered a certified document.

Alfred Benesch & Company
[illegible] Street
Lincoln, NE 68508
www.benesch.com
P [illegible]
F [illegible]

[illegible], 2011

[illegible]
Public Works Liaison and Compliance Administrator
City of Lincoln
[illegible] S. 10th St. [illegible] Floor
Lincoln, NE 68508

REFERENCE: BNSF Electrical, Communications, & Signal Building

Dear [illegible]:

Please find enclosed the results of the Asbestos survey performed for the above referenced building. The survey was performed on March 29, 2011 by Ron J. Prochaska of Alfred Benesch & Company (Benesch). The building is scheduled for demolition. During the survey of the building, the following suspect asbestos containing materials (ACM) were discovered:

1. Fire Door paper infill
2. White 12x12 floor tile and mastic
3. 2x2 lay-in ceiling tile
4. Window glazing

[illegible] samples of each of these materials were collected. The samples were submitted to [illegible] Technologies Laboratory for analysis for asbestos. Please find attached, an Entry Sheet and the laboratory reports, pertaining to these materials.

According to the Nebraska Asbestos Control Program and EPA NESHAPS regulations, an ACM is a material found to contain more than 1% asbestos. The following suspect material was found to contain more than 1% asbestos and is considered ACM.

1. Fire door paper infill in metal door between the boiler room and the north electrical shop ([illegible])

According to the Nebraska asbestos control regulations, this material will have to be removed prior to the demolition of the building. After this material has been removed please contact Benesch to perform a visual inspection to verify the removal. This material could be removed without disturbing the asbestos by simply removing the entire door "intact" prior to demolition.

Please note that the following suspect ACM were identified and sampled by [illegible] prior to this survey:

1. 12x12 floor tile and mastic in the north electrical offices. Not ACM as per sampling in 1993.
2. 12x12 floor tile and mastic in the south electrical restroom. Not ACM as per sampling in 1993. (the same floor tile is present in the center break room)
3. Mudded pipe-fitting insulation on steam lines throughout the building. Removed in 1993.

If you have any questions regarding this report please call me at [illegible] or [illegible].

Sincerely,
ALFRED BENESCH & COMPANY

Ron J. Prochaska
Senior Environmental Technician / Asbestos Inspector, Nebraska Certificate [illegible]

pc: Tom [illegible], Olsson Associates

benesch
engineers · scientists · planners

ASBESTOS BULK MATERIAL TALLY SHEET AND RESULTS

PROJECT NUMBER: 00110058.00.00006

PROJECT: West Haymarket

INSPECTOR(S): Ron J.Prochaska

PROPERTY: BNSF Electrical, Communications, & Signal Building

INSP.	SAMPLE NUMBER	DATE	MATERIAL DESCRIPTION	SAMPLE LOCATION DESCRIPTION	LAB RESULTS	QUANTITY
R.J.P.	BNSF-ECS-FD-01A	3/29/11	fire door paper infill	door between boiler room and south shop	70%	17 SF
R.J.P.	BNSF-ECS-FT-02B	3/29/11	12x12 floor tile and mastic	center break room and restroom area	ND	NA
R.J.P.	BNSF-ECS-CT-03C	3/29/11	2x2 lay-in ceiling tile	center break room and hallway area	ND	NA
R.J.P.	BNSF-ECS-WG-04D	3/29/11	window glazing	south window of south office	ND	NA
R.J.P.	BNSF-ECS-WG-05D	3/29/11	window glazing	east window of center restroom	ND	NA
R.J.P.	BNSF-ECS-WG-06D	3/29/11	window glazing	west center window of south shop	ND	NA
EMR	LN-LHY-ESB-16	4/14/93	12x12 floor tile and mastic	south electrical shop offices	ND	NA
EMR	LN-LHY-ESB-18	4/14/93	12x12 floor tile and mastic	south electrical shop restroom	ND	NA

ND= No Asbestos Detected

NA= Not Asbestos

Note: Sample results dated 4/14/93 are from an asbestos survey performed by EMR on that date.

SanAir Technologies Laboratory

Analysis Report

prepared for

Alfred Benesch & Co.

Report Date: 3/31/2011
Project Name: West Haymarket,ECS Building
Project #: 00110058.00.00006
SanAir ID#: 11004207

NVLAP LAB CODE 200870-0

AIHA LAP, LLC ACCREDITED LABORATORY ENVIRONMENTAL MICROBIOLOGY

Virginia SBE Certification # 652931

Texas Licensed Mold Analysis Laboratory License # LAB0166

SanAir Technologies Laboratory

804.897.1177 www.sanair.com

SanAir Technologies Laboratory, Inc.
1551 Oakbridge Drive, Suite B, Powhatan, VA 23139
804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: iaq@sanair.com

Alfred Benesch & Co.
825 J Street
Lincoln, NE 68508

March 31, 2011

SanAir ID # 11004207
Project Name: West Haymarket,ECS Building
Project Number: 00110058.00.00006

Dear Ron Prochaska,

We at SanAir would like to thank you for the work you recently submitted. The 3 sample(s) were received on Wednesday, March 30, 2011 via FedEx. The final report(s) is enclosed for the following sample(s): BNSF-ECS-FD-01A, BNSF-ECS-FT-02B, BNSF-ECS-CT-03C.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

Sandra Sobrino

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

sample conditions:
3 sample(s) in Good condition

SanAir Technologies Laboratory, Inc.
1551 Oakbridge Drive, Suite B, Powhatan, VA 23139
804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: iaq@sanair.com

SanAir ID Number
11004207
FINAL REPORT

Name: Alfred Benesch & Co.
Address: 825 J Street
Lincoln, NE 68508

Project Number: 00110058.00.00006
P.O. Number: Amended Report
Project Name: West Haymarket,ECS Building

Collected Date: 3/29/2011
Received Date: 3/30/2011 10:00:00 AM
Report Date: 3/31/2011 12:39:46 PM
Analyst: Pisula, Nicholas

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
BNSF-ECS-FD-01A / 11004207-001 Fire Door Paper Infill	Grey Fibrous Homogeneous	20% Cellulose	10% Other	70% Chrysotile

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
BNSF-ECS-FT-02B / 11004207-002 12"x12" Floor Tile and Mastic, Floor Tile	White Non-Fibrous Homogeneous		100% Other	None Detected
BNSF-ECS-FT-02B / 11004207-002 12"x12" Floor Tile and Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
BNSF-ECS-CT-03C / 11004207-003 2'x2' Lay-In Ceiling Tile	White Non-Fibrous Homogeneous	40% Min. Wool	60% Other	None Detected

Certification

Signature: [illegible] Reviewed: Sandra Sobrino
Date: 3/31/2011 Date: 3/31/2011

Disclaimer

The final report cannot be reproduced, except in full, without written authorization from SanAir. Fibers smaller than 5 microns cannot be seen with this method due to scope limitations. The accuracy of the results is dependent upon the client's sampling procedure and information provided to the laboratory by the client. SanAir assumes no responsibility for the sampling procedure and will provide evaluation reports based solely on the sample and information provided by the client. This report may not be used by the client to claim product endorsement by NVLAP, AIHA or any other agency of the U.S. government; *and may not be certified by every local, state and federal regulatory agencies.*

SanAir Technologies Laboratory, Inc.
1551 Oakbridge Drive, Suite B - Powhatan, VA 23139
804.897.1177 / 888.895.1177 / Fax 804.897.0070
www.sanair.com

Asbestos Chain of Custody

SanAir ID Number: 11004207

Company	Alfred Benesch & Co.	Project #.	00110058.00.00006	Phone #.	402-479-2296
Address	825 J Street	Project Name:	West Haymarket, ECS Building	Phone #.	402-580-6409
City, St., Zip	Lincoln, NE 68508	Date Collected:	3/29/2011	Fax #	402-479-2276
Samples Collected By.	Ron Prochaska	P.O. Number:		Email:	rprochaska@benesch.com

Asbestos Analysis Types

Bulk			Air			Soil/Vermiculite		
ABB	PLM EPA 600/R-93/116	☑	ABA	PCM NIOSH 7400	☐	ABSE	PLM EPA 600/R-93/116 (Qual.)	☐
	Positive Stop ☐		ABA-2	OSHA w/ TWA*	☐	ABSP	PLM CARB 435 (LOD <1%)	☐
ABEPA	PLM EPA 400 Point Count	☐	ABTEM	TEM AHERA	☐	ABSP1	PLM CARB 435 (LOD 0.25%)	☐
ABB1K	PLM EPA 1000 Point Count	☐	ABATN	TEM NIOSH 7402	☐	ABSP2	PLM CARB 435 (LOD 0.1%)	☐
ABBEN	PLM EPA NOB	☐	ABT2	TEM Level II	☐			
ABBCH	TEM Chatfield	☐						
ABBTM	TEM EPA NOB	☐		**Water**			**Dust**	
ABBNY	TEM NY ELAP 198.4	☐	ABHE	EPA 100.2	☐	ABWA	TEM Wipe ASTM D-6480	☐
OTHER/ Matrix :		☐				ABDMV	TEM Microvac ASTM D-5755	☐

Turn Around Times				
	☐ 3 HR (4 HR TEM)	☐ 6 HR (8HR TEM)	☐ 12 HR	☑ 24 HR
	2 Days ☐	3 Days ☐	4 Days ☐	5 Days ☐

Sample #	Sample Identification/Location	Volume or Area	Sample Type	Flow Rate*	Time* Start – Stop	
BNSF-ECS-FD-01A	fire door paper infill					
BNSF-ECS-FT-02B	white 12"x12" floor tile and mastic					
BNSF-ECS-CT-03C	2'x2' lay-in ceiling tile					

Special Instructions

Relinquished by	Date	Time	Received by	Date	Time
[signature]	3/29/11 - 1600		MB	MAR 30 2011	1000 AM

Unless scheduled, the turn around time for all samples received after 5 pm Friday will begin at 8 am Monday morning.
Weekend or Holiday work must be scheduled ahead of time and is charged for rush turn around time.
Work with standard turn around time sent Priority Overnight and Billed To Recipient will be charged a $10 shipping fee.

SanAir Technologies Laboratory

Analysis Report

prepared for

Alfred Benesch & Co.

Report Date: 3/31/2011
Project Name: West Haymarket, ECS Building
Project #: 00110058.00.00006
SanAir ID#: 11004205

NVLAP LAB CODE 200870-0

AIHA LAP, LLC
ACCREDITED LABORATORY
ENVIRONMENTAL MICROBIOLOGY

Virginia SBE
Certification # 652931

Texas Licensed Mold Analysis Laboratory
License # LAB0166

SanAir Technologies Laboratory

804.897.1177 www.sanair.com

SanAir Technologies Laboratory, Inc.
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Web: http://www.sanair.com E-mail: iaq@sanair.com

Alfred Benesch & Co.
825 J Street
Lincoln, NE 68508

March 31, 2011

SanAir ID # 11004205
Project Name: West Haymarket, ECS Building
Project Number: 00110058.00.00006

Dear Ron Prochaska,

We at SanAir would like to thank you for the work you recently submitted. The 3 sample(s) were received on Wednesday, March 30, 2011 via FedEx. The final report(s) is enclosed for the following sample(s): BNSF-ECS-WG-04D, BNSF-ECS-WG-05D, BNSF-ECS-WG-06D.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

Sandra Sobrino

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

sample conditions:
3 sample(s) in Good condition

SanAir Technologies Laboratory, Inc.
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804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: iaq@sanair.com

SanAir ID Number
11004205
FINAL REPORT

Name: Alfred Benesch & Co.
Address: 825 J Street
Lincoln, NE 68508

Project Number: 00110058.00.00006
P.O. Number:
Project Name: West Haymarket, ECS Building

Collected Date: 3/29/2011
Received Date: 3/30/2011 10:00:00 AM
Report Date: 3/31/2011 12:39:01 PM
Analyst: Pisula, Nicholas

Asbestos Bulk EPA PLM 400 Point Count

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
BNSF-ECS-WG-04D / 11004205-001 Window Glazing	Grey Non-Fibrous Homogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
BNSF-ECS-WG-05D / 11004205-002 Window Glazing	Grey Non-Fibrous Homogeneous		100% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
BNSF-ECS-WG-06D / 11004205-003 Window Glazing	Grey Non-Fibrous Homogeneous		100% Other	None Detected

Certification

Signature: [illegible]
Date: 3/31/2011

Reviewed: Sandra Sobrino
Date: 3/31/2011

Disclaimer

The final report cannot be reproduced, except in full, without written authorization from SanAir. Fibers smaller than 5 microns cannot be seen with this method due to scope limitations. The accuracy of the results is dependent upon the client's sampling procedure and information provided to the laboratory by the client. SanAir assumes no responsibility for the sampling procedure and will provide evaluation reports based solely on the sample and information provided by the client. This report may not be used by the client to claim product endorsement by NVLAP, AIHA or any other agency of the U.S. government; *and may not be certified by every local, state and federal regulatory agencies.*

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804.897.1177 / 888.895.1177 / Fax 804.897.0070
www.sanair.com

Asbestos Chain of Custody

SanAir ID Number: 11004205

Company: Alfred Benesch & Co.		Project #: 00110058.00.00006	Phone #: 402-479-2296
Address: 825 J Street		Project Name: West Haymarket, ECS Building	Phone #: 402-580-6409
City, St., Zip: Lincoln, NE 68508		Date Collected: 3/29/2011	Fax #: 402-479-2276
Samples Collected By: Ron Prochaska		P.O. Number:	Email: rprochaska@benesch.com

Asbestos Analysis Types

Bulk			Air			Soil/Vermiculite		
ABB	PLM EPA 600/R-93/116	☐	ABA	PCM NIOSH 7400	☐	ABSE	PLM EPA 600/R-93/116 (Qual.)	☐
	Positive Stop ☐		ABA-2	OSHA w/ TWA*	☐	ABSP	PLM CARB 435 (LOD <1%)	☐
ABEPA	PLM EPA 400 Point Count	☑	ABTEM	TEM AHERA	☐	ABSP1	PLM CARB 435 (LOD 0.25%)	☐
ABB1K	PLM EPA 1000 Point Count	☐	ABATN	TEM NIOSH 7402	☐	ABSP2	PLM CARB 435 (LOD 0.1%)	☐
ABBEN	PLM EPA NOB	☐	ABT2	TEM Level II	☐			
ABBCH	TEM Chatfield	☐						
ABBTM	TEM EPA NOB	☐		**Water**			**Dust**	
ABBNY	TEM NY ELAP 198.4	☐	ABHE	EPA 100.2	☐	ABWA	TEM Wipe ASTM D-6480	☐
OTHER/ Matrix :		☐				ABDMV	TEM Microvac ASTM D-5755	☐

Turn Around Times				
	☐ 3 HR (4 HR TEM)	☐ 6 HR (8HR TEM)	☐ 12 HR	☑ 24 HR
	2 Days ☐	3 Days ☐	4 Days ☐	5 Days ☐

Sample #	Sample Identification/Location	Volume or Area	Sample Type	Flow Rate*	Time* Start	Stop
BNSF-ECS-WG-04D	Window glazing					
BNSF-ECS-WG-05D	Window glazing					
BNSF-ECS-WG-06D	Window glazing					

Special Instructions	

Relinquished by	Date	Time	Received by	Date	Time
[signature]	3/29/11 - 1600		MB	MAR 30 2011	1000AM

Unless scheduled, the turn around time for all samples received after 5 pm Friday will begin at 8 am Monday morning.
Weekend or Holiday work must be scheduled ahead of time and is charged for rush turn around time.
Work with standard turn around time sent Priority Overnight and Billed To Recipient will be charged a $10 shipping fee.

benesch

[redacted]

April [redacted], 2011

[redacted]
[redacted]
[redacted]
[redacted]
[redacted]

REFERENCE: [redacted]

Dear Mr. Espeitia:

Please find enclosed the results of the Asbestos survey performed at the above referenced facility. The survey was performed on March [redacted], 2011 by Fred J. Pomposelli, Certified Environmental Technician. The building is scheduled for demolition. During the survey of the building, the following suspect asbestos containing materials (ACM) were discovered:

1. Transparent bituminous quasi-sheeting
2. [redacted]
3. expansion caulking and other putty
4. Window glazing

The following suspect materials, all photographed in the building, were sampled and analyzed by EMR, Inc. in [redacted]:

1. Floor tile and mastic (not ACM as per sampling in [redacted])
2. [redacted] (NOT ACM as per sampling in [redacted])
3. Cement asbestos wall and ceiling board (40% chrysotile asbestos as per sampling in [redacted])

[redacted] samples of each of the new materials uncovered by Benesch were collected. The samples were submitted to [redacted] Technologies Laboratory for analysis for asbestos. Please find attached, a fully signed and dated laboratory report pertaining to these materials.

According to the Nebraska Asbestos Control Program and EPA NESHAPS requirements, an ACM is defined to contain more than 1% asbestos. Based on the bulk analysis, none of the new materials sampled were found to contain more than 1% asbestos. Based the bulk analysis performed, the following material is considered to be ACM:

1. Cement asbestos wall and ceiling board throughout the south shop and office area (NOT LSF)

According to the Nebraska Asbestos Control Program regulations, the material will have to be removed prior to the demolition of the building. Please find attached a copy of Section [redacted] of the Nebraska Asbestos Control Program regulations pertaining to the removal of cement asbestos board. If the removal of this material cannot be performed utilizing these procedures, the material must be removed by a licensed abatement contractor. Please note that in some areas of the building, transparent bituminous ACM wallboard and/or other ACM behind it will need to be removed to gain access to the material. After this material has been removed, please contact Benesch to perform an final inspection to verify the removal.

If you have any questions regarding the report, please call me at [redacted] or cell [redacted].

Sincerely,
ALFRED BENESCH & COMPANY

[redacted]
Senior Environmental Technician Asbestos Inspector, Nebraska Certificate [redacted]

[redacted]

benesch
engineers · scientists · planners

ASBESTOS BULK MATERIAL TALLY SHEET AND RESULTS

PROJECT NUMBER: 00110058.00.00006

PROJECT: West Haymarket

INSPECTOR(S): Ron J.Prochaska

PROPERTY: BNSF B&B Quonset Building

INSP.	SAMPLE NUMBER	DATE	MATERIAL DESCRIPTION	SAMPLE LOCATION DESCRIPTION	LAB RESULTS	QUANTITY
R.J.P.	BNSF-BB-TAR-01A	3/29/11	tar sealant between metal sheeting	north roof area	ND	NA
R.J.P.	BNSF-BB-CT-02B	3/29/11	2x2 lay-in ceiling tile	center office area	ND	NA
R.J.P.	BNSF-BB-ET-03C	3/29/11	exterior tar coating and silver paint	west exterior wall	<1%	NA
R.J.P.	BNSF-BB-WG-04D	3/29/11	window glazing	west center window	0.25%	NA
EMR	LN-LHY-BB-06 through 11	4/14/93	floor tile and mastics	carpenter shop	ND	NA
EMR	LN-LHY-BB-13	4/14/93	2x4 ceiling tile	above lay-in in center office area	ND	NA
EMR	LN-LHY-BB-15	4/14/93	cement asbestos board	walls and ceiling of south building area	40%	2800 SF

ND= No Asbestos Detected

NA= Not Asbestos

Note: Sample results dated 4/14/93 are from an asbestos survey performed by EMR on that date.

SanAir Technologies Laboratory

Analysis Report

prepared for

Alfred Benesch & Co.

Report Date: 3/31/2011
Project Name: West Haymarket, BB Building
Project #: 00110058.00.00006
SanAir ID#: 11004201

NVLAP LAB CODE 200870-0

AIHA LAP, LLC ACCREDITED LABORATORY ENVIRONMENTAL MICROBIOLOGY

Virginia SBE
Certification # 652931

Texas Licensed Mold Analysis Laboratory
License # LAB0166

SanAir Technologies Laboratory

804.897.1177 www.sanair.com

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Web: http://www.sanair.com E-mail: iaq@sanair.com

Alfred Benesch & Co.
825 J Street
Lincoln, NE 68508

March 31, 2011

SanAir ID # 11004201
Project Name: West Haymarket, BB Building
Project Number: 00110058.00.00006

Dear Ron Prochaska,

We at SanAir would like to thank you for the work you recently submitted. The 3 sample(s) were received on Wednesday, March 30, 2011 via FedEx. The final report(s) is enclosed for the following sample(s): BNSF-BB-TAR-01A, BNSF-BB-CT-02B, BNSF-BB-ET-03C.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

Sandra Sobrino

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

sample conditions:
3 sample(s) in Good condition

SanAir Technologies Laboratory, Inc.
1551 Oakbridge Drive, Suite B, Powhatan, VA 23139
804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: iaq@sanair.com

SanAir ID Number
11004201
FINAL REPORT

Name: Alfred Benesch & Co.
Address: 825 J Street
Lincoln, NE 68508

Project Number: 00110058.00.00006
P.O. Number:
Project Name: West Haymarket, BB Building

Collected Date: 3/29/2011
Received Date: 3/30/2011 10:00:00 AM
Report Date: 3/31/2011 12:36:46 PM
Analyst: Pisula, Nicholas

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
BNSF-BB-TAR-01A / 11004201-001 Tar Sealant Between Quonset Sheeting	Black Non-Fibrous Homogeneous	5% Cellulose	95% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
BNSF-BB-CT-02B / 11004201-002 2'x2' Lay-In Ceiling Tile	White Fibrous Homogeneous	60% Cellulose 30% Min. Wool	10% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	Components % Non-Fibrous	Asbestos Fibers
BNSF-BB-ET-03C / 11004201-003 Exterior Tar Sealant with Silver Paint	Black Non-Fibrous Homogeneous	10% Cellulose	90% Other	< 1% Chrysotile

Certification

Signature: [illegible]
Date: 3/31/2011

Reviewed: Sandra Sobrino
Date: 3/31/2011

Disclaimer

The final report cannot be reproduced, except in full, without written authorization from SanAir. Fibers smaller than 5 microns cannot be seen with this method due to scope limitations. The accuracy of the results is dependent upon the client's sampling procedure and information provided to the laboratory by the client. SanAir assumes no responsibility for the sampling procedure and will provide evaluation reports based solely on the sample and information provided by the client. This report may not be used by the client to claim product endorsement by NVLAP, AIHA or any other agency of the U.S. government*; and may not be certified by every local, state and federal regulatory agencies.*

SanAir Technologies Laboratory, Inc.
1551 Oakbridge Drive, Suite B - Powhatan, VA 23139
804.897.1177 / 888.895.1177 / Fax 804.897.0070
www.sanair.com

Asbestos Chain of Custody

SanAir ID Number: 11004201

Company	Alfred Benesch & Co.	Project #:	00110058.00.00006	Phone #:	402-479-2296
Address	825 J Street	Project Name:	West Haymarket, BB Building	Phone #	402-580-6409
City, St., Zip:	Lincoln, NE 68508	Date Collected:	3/29/2011	Fax #:	402-479-2276
Samples Collected By:	Ron Prochaska	P.O. Number:		Email:	rprochaska@benesch.com

Asbestos Analysis Types

Bulk			Air			Soil/Vermiculite		
ABB	PLM EPA 600/R-93/116	☑	ABA	PCM NIOSH 7400	☐	ABSE	PLM EPA 600/R-93/116 (Qual.)	☐
	Positive Stop ☐		ABA-2	OSHA w/ TWA*	☐	ABSP	PLM CARB 435 (LOD <1%)	☐
ABEPA	PLM EPA 400 Point Count	☐	ABTEM	TEM AHERA	☐	ABSP1	PLM CARB 435 (LOD 0.25%)	☐
ABB1K	PLM EPA 1000 Point Count	☐	ABATN	TEM NIOSH 7402	☐	ABSP2	PLM CARB 435 (LOD 0.1%)	☐
ABBEN	PLM EPA NOB	☐	ABT2	TEM Level II	☐			
ABBCH	TEM Chatfield	☐						
ABBTM	TEM EPA NOB	☐		**Water**			**Dust**	
ABBNY	TEM NY ELAP 198.4	☐	ABHE	EPA 100.2	☐	ABWA	TEM Wipe ASTM D-6480	☐
OTHER/ Matrix :		☐				ABDMV	TEM Microvac ASTM D-5755	☐

Turn Around Times				
	☐ 3 HR (4 HR TEM)	☐ 6 HR (8HR TEM)	☐ 12 HR	☑ 24 HR
	2 Days ☐	3 Days ☐	4 Days ☐	5 Days ☐

Sample #	Sample Identification/Location	Volume or Area	Sample Type	Flow Rate*	Time* Start	Stop
BNSF-BB-TAR-01A	tar sealant between quonset sheeting					
BNSF-BB-CT-02B	2'x2' lay-in ceiling tile					
BNSF-BB-ET-03C	exterior tar sealant with silver paint					

Special Instructions

Relinquished by	Date	Time	Received by	Date	Time
[signature]	3/29/11	1600	NB	MAR 30 2011	1000AM

Unless scheduled, the turn around time for all samples received after 5 pm Friday will begin at 8 am Monday morning.
Weekend or Holiday work must be scheduled ahead of time and is charged for rush turn around time.
Work with standard turn around time sent Priority Overnight and Billed To Recipient will be charged a $10 shipping fee.

SanAir Technologies Laboratory

Analysis Report

prepared for

Alfred Benesch & Co.

Report Date: 3/31/2011
Project Name: West Haymarket, BB Building
Project #: 00110058.00.00006
SanAir ID#: 11004204

NVLAP LAB CODE 200870-0

AIHA LAP, LLC ACCREDITED LABORATORY ENVIRONMENTAL MICROBIOLOGY

Virginia SBE Certification # 652931

Texas Licensed Mold Analysis Laboratory License # LAB0166

SanAir Technologies Laboratory

804.897.1177 www.sanair.com

SanAir Technologies Laboratory, Inc.
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Web: http://www.sanair.com E-mail: iaq@sanair.com

Alfred Benesch & Co.
825 J Street
Lincoln, NE 68508

March 31, 2011

SanAir ID # 11004204
Project Name: West Haymarket, BB Building
Project Number: 00110058.00.00006

Dear Ron Prochaska,

We at SanAir would like to thank you for the work you recently submitted. The 1 sample(s) were received on Wednesday, March 30, 2011 via FedEx. The final report(s) is enclosed for the following sample(s): BNSF-BB-WG-04D.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

Sandra Sobrino

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

sample conditions:
1 sample(s) in Good condition

SanAir Technologies Laboratory, Inc.
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Web: http://www.sanair.com E-mail: iaq@sanair.com

SanAir ID Number
11004204
FINAL REPORT

Name: Alfred Benesch & Co.
Address: 825 J Street
Lincoln, NE 68508

Project Number: 00110058.00.00006
P.O. Number:
Project Name: West Haymarket, BB Building

Collected Date: 3/29/2011
Received Date: 3/30/2011 10:00:00 AM
Report Date: 3/31/2011 11:45:29 AM
Analyst: Pisula, Nicholas

Asbestos Bulk EPA PLM 400 Point Count

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
BNSF-BB-WG-04D / 11004204-001 Window Glazing	Grey Non-Fibrous Homogeneous		99.75% Other	0.25% Chrysotile

Certification

Signature: [signature]
Date: 3/31/2011

Reviewed: Sandra Sobrino
Date: 3/31/2011

Disclaimer

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Asbestos Chain of Custody

SanAir ID Number: 11004204

Company:	Alfred Benesch & Co.	Project #:	00110058.00.00006	Phone #:	402-479-2296
Address:	825 J Street	Project Name:	West Haymarket, BB Building	Phone #:	402-580-6409
City, St., Zip:	Lincoln, NE 68508	Date Collected:	3/29/2011	Fax #:	402-479-2276
Samples Collected By:	Ron Prochaska	P.O. Number:		Email:	rprochaska@benesch.com

Asbestos Analysis Types

Bulk			Air			Soil/Vermiculite		
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ABBEN	PLM EPA NOB	☐	ABT2	TEM Level II	☐			
ABBCH	TEM Chatfield	☐						
ABBTM	TEM EPA NOB	☐		**Water**			**Dust**	
ABBNY	TEM NY ELAP 198.4	☐	ABHE	EPA 100.2	☐	ABWA	TEM Wipe ASTM D-6480	☐
OTHER/ Matrix :		☐				ABDMV	TEM Microvac ASTM D-5755	☐

Turn Around Times				
	☐ 3 HR (4 HR TEM)	☐ 6 HR (8HR TEM)	☐ 12 HR	☑ 24 HR
	2 Days ☐	3 Days ☐	4 Days ☐	5 Days ☐

Sample #	Sample Identification/Location	Volume or Area	Sample Type	Flow Rate*	Time* Start – Stop	
BNSF-BB-WG-04D	window glazing					

Special Instructions	

Relinquished by	Date	Time	Received by	Date	Time
[signature]	3/29/11	[illegible]	MB	MAR 30 2011	1000 AM

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Work with standard turn around time sent Priority Overnight and Billed To Recipient will be charged a $10 shipping fee.

project designer, and who is independent of the contractor and selected by the owner or operator of the structure on or in which the asbestos project is conducted to examine the work area to determine whether ACM debris has been removed. The individual who examined the work area must provide, prior to abatement or demolition, a written report to both the contractor and the Department stating both their findings along with their name, address and license number.

22-020 WORK PRACTICES TO BE FOLLOWED FOR PROJECTS IN TUNNELS AND CRAWL SPACES. The licensed or waivered business entity or licensed individual responsible for any asbestos abatement project in a tunnel or crawl space which is or will be directly accessible from an occupied area must comply with the following:

1. Establish general security and housekeeping work practices in accordance with 178 NAC 22-011.

2. Establish and manage a containment area in accordance with the work practices of 178 NAC 22-012. Such work practices need not include the use of plastic sheeting for walls or floors within the containment area as required by 178 NAC 22-012.01 and 22-012.01C but will require the use of plastic sheeting drop cloths on the floor immediately underneath the location where ACM is being actively removed. Such work practices will not include the requirement for performing final cleanup of sampling as required by 178 NAC 22-012.06. Prevent all gross contamination and ACM debris on the floor of the tunnel or crawl space by wet cleaning methods and place directly into 6 mil thick ACM waste disposal bags in accordance with 178 NAC 22-001 before debris is removed.

3. Remove ACM will in accordance with 178 NAC 22-013. Place all ACM and visible debris and fibrous removal contaminated during the project cleanup into ACM waste disposal bags in accordance with 178 NAC 22-001.

4. At the conclusion of the project, the licensed or waivered business entity or licensed individual responsible for the project must have a third party who is licensed by the Department as a supervisor, inspector, management planner, project monitor, or project designer and who is independent of the contractor and selected by the owner or operator of the structure on or in which the asbestos project is conducted examine the work area to determine whether ACM debris has been removed.

   a. The individual who examined the tunnel must provide within seven days a written report to both the contractor and the Department stating both their findings along with their name, address and license number.

22-021 LIMITED LOOKING SIGNOFF FOR SOME PROJECTS.

22-020.01 Asbestos projects other than Asbestos Related Demolition Projects regulated under 178 NAC 22-014, that involve only ACM floor tile, other floor coverings, [illegible]

[illegible] work on or in the homeowner's residential property. Projects involving ACM floor tile, sheet flooring, shingles, or siding, require notification in accordance with 178 NAC 22-008 whether performed in a friable or non-friable manner. Non-friable projects will not be subject to the notification fee set in 178 NAC 22-009.04.

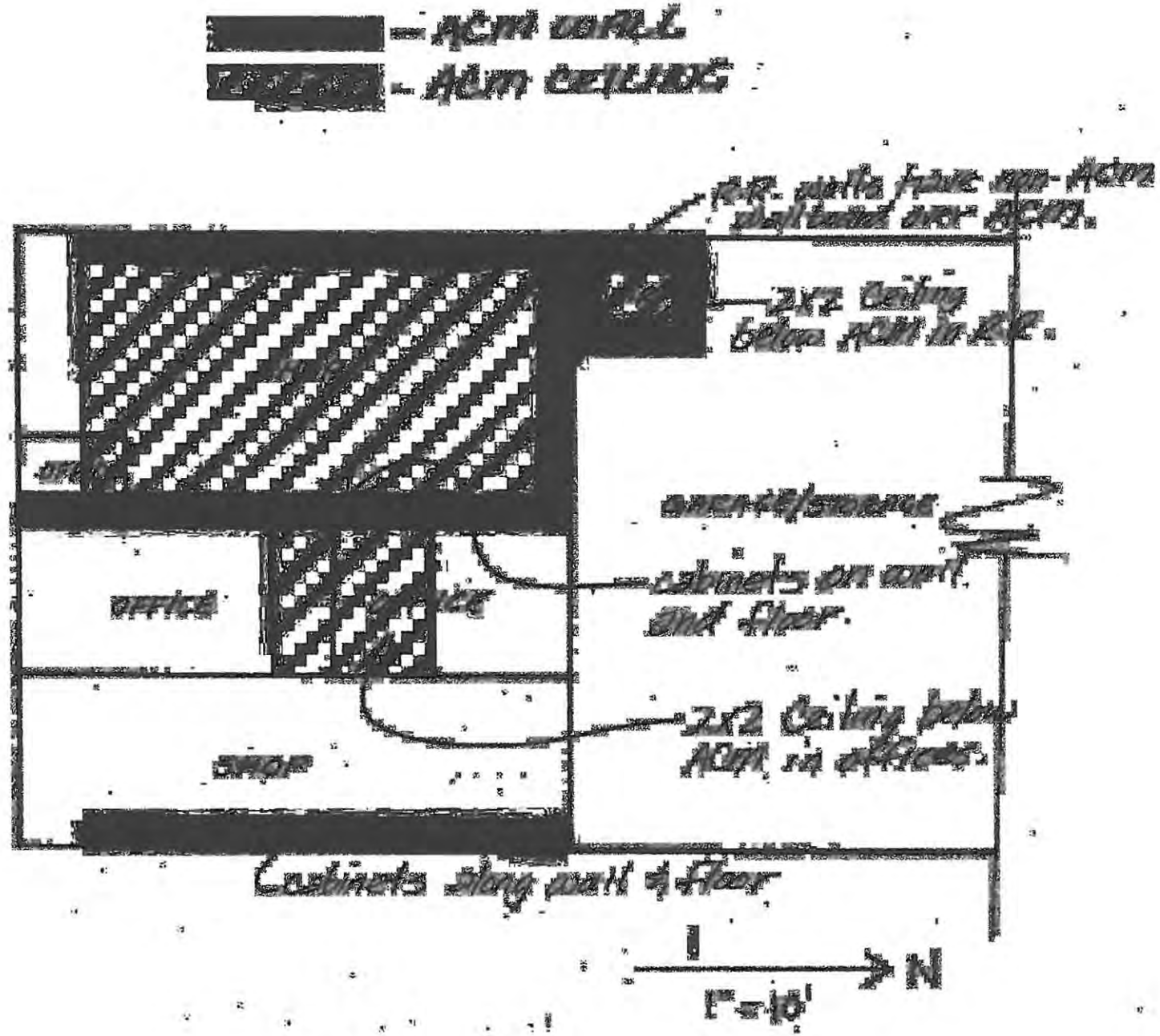
22-020.01A Projects performed in a non-friable manner

1. Non-friable vinyl asbestos floor tile, asbestos sheet flooring, asbestos adhesive (mastic), asbestos shingles, and asbestos siding can be removed by anyone and is not subject to the work practice regulations, providing the materials remain non-friable during the removal process. Any process that cuts, crushes, grinds, abrades, pulverizes, or burns, including dropping from a height, will make the non-friable asbestos material friable and regulated.
2. It is recommended that non-friable asbestos material be placed in boxes and then in 6 mil thick plastic bags or other type of container that can be sealed so that it is air tight, and asbestos fibers can not escape into the atmosphere. Asbestos floor tile, mastic, shingles, and siding removed by non-friable methods do not have to be disposed of in licensed asbestos landfills. Contact the landfill operator to find out if they accept the material and how they would require it to be packaged.
3. If an amount of non-friable ACM that equals three square feet has become friable, discontinue removal activity immediately.

   a. Do not resume removal activity until all surfaces in the work area that possibly have become contaminated with ACM have been cleaned thoroughly with a HEPA filter-equipped vacuuming device or by wet cleaning methods.
   b. The Department will accept an amendment to the notification previously submitted indicating the ACM has become friable and this project will be performed in accordance with 178 NAC 22-020.01.
   c. If the project is equal to or greater than 260 linear feet or any combination which is equal to or greater than 160 square feet and linear feet, it will be subject to the fee requirements set out in 178 NAC 22-009.03. Such project may also be subject to the notification requirements of the NESHAP regulations of the [illegible]

22-020.01B Projects performed in a friable manner. If a project will be performed in a friable manner, only the following requirements will apply to the licensed or waivered business entity or licensed individual:

1. For indoor projects:


ACM wall
ACM ceiling
2x2 ceiling
cabinets on wall and floor.
2x2 ceiling
Cabinets along wall & floor
N

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Alfred Benesch & Company
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March 30, 2011

Mr. Daniel K. Marvin
Joint Public Authority
555 South 10th Street
Lincoln, NE 68508

REFERENCE: Geotechnical Engineering Report
Flood Storage Area Soil Survey
West Haymarket Project
Lincoln, Nebraska

Dear Mr. Marvin:

This report summarizes the findings of the subsurface exploration, laboratory tests and a geotechnical analysis to assess the nature and characteristics of the soils that have, and will be excavated and stockpiled, from the flood storage excavation being performed as part of the BNSF West Haymarket Grading and Utilities Project For Track Relocation. The geotechnical evaluation assessed the suitability of the excavated materials for reuse as fill within the West Haymarket Arena and surrounding building structures and paved areas. Additionally, the moisture content and compaction characteristics were determined for the suitable fill materials. This data was utilized to determine if the excavated soils will require moisture manipulation (in particular drying) prior to placement and compaction, in order to obtain the degree of compaction specified for the project.

The degree of compaction assumed for fill and backfill constructed for the proposed arena, and for all other building pads and paved areas located within the portion of the West Haymarket development area from the proposed arena location to the "O" Street overpass, was 98% of the "Maximum Dry Density" as determined by ASTM D 698, Procedure A, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf./ft^3) (600 kN-m/m^3). Reference should be made to Benesch's December 29th, 2010 geotechnical engineering report, *"Proposed Arena and Parking Garage; West Haymarket Project; Lincoln, NE"*, which recommends these compaction requirements and moisture recommendations for backfill and fill placed within building areas and areas to be paved.

SUBSURFACE EXPLORATION

A program of Dutch friction-cone soundings, test borings and soil sampling was performed at the project site from March 3 to March 14, 2011. Sixteen (16) Dutch friction-cone soundings and twenty (20) exploratory

borings were taken to depths of 10 to 15 feet below the existing grade to establish the general subsurface conditions the flood storage area. Additionally, two (2) borings were performed atop and to the depth of the two existing soil stockpiles that are located to the south of the "O" Street overpass (between approximately 4th and 5th Streets, and "M" to "O" Streets). Borings SS1-21 and SS1-22 were made at the north stockpile and south stockpile, respectively. Reference should be made to the boring location plan which shows the locations of the 20 borings performed within the flood storage excavation areas.

The Dutch friction-cone soundings were performed with a mechanical penetrometer in accordance with ASTM D 3441, Standard Method for Deep, Quasi-Static, Cone, and Friction Cone Penetration Tests of Soil. The plot of the data from this test identifies the relative positions and thicknesses of hard and soft layers of soil.

The borings were made in accordance with ASTM D 1452, Standard Practice for Soil Investigation and Sampling by Auger Borings. A machine-driven, continuous-flight auger having a diameter of 6 inches was used to advance the holes for soil sampling and logging. Eight of the borings were performed using a truck-mounted drill rig. The remainder of the borings were performed using a Bob Cat mounted drill rig due to surficial muddy site conditions existent at the time the subsurface exploratory operations were being performed.

The vicinity map and the boring location plan are presented in Appendix A. The penetration diagrams (see Appendix B) present the results of the Dutch friction-cone soundings. The boring logs (see Appendix C) present the data obtained in the subsurface exploration. The logs include the surface elevations, the approximate depths and elevations of major changes in the character of the subsurface materials, visual descriptions of the materials in accordance with the criteria presented in Appendix D, and groundwater data.

The locations and elevations (NAVD88) of the soundings and borings were determined by GPS by Benesch's survey crew. Water level readings were made in the auger borings at times and under conditions stated on the boring logs.

LABORATORY ANALYSES

The disturbed soil samples obtained during the subsurface exploration were examined in the laboratory by a member of Benesch's professional engineering staff to supplement the field identification. Standard tests were performed on selected samples to determine the engineering properties of the subsurface materials.

The moisture contents and dry unit weights of selected undisturbed soil samples were determined in the laboratory. These test results are presented in the boring logs opposite the respective sample locations. The moisture contents were determined in accordance with ASTM D 2216, Standard Test Method for Determination of Water (Moisture) Content of Soil and Rock by Mass.

The plasticity characteristics of air-dried samples of subsurface and stockpile soils were determined in accordance with ASTM Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils (ASTM D 4318). The test results are presented in Table 1.

TABLE 1
ATTERBERG LIMITS

Lab No.	Source/ Soil Type	Liquid Limit, %	Plastic Limit, %	Plasticity Index	Group Symbol
29479	Composite / Alluvium	35	22	13	CL-Lean Clay
29480	SS1-5 (0'-5'), SS1-15 (5'-8') / Alluvium	40	19	21	CL-Lean Clay
29481	SS1-9 (2'-6') / Alluvium	47	19	28	CL-Lean Clay
29482	SS1-11 (0'-3.5') / Fill	45	25	20	CL-Sandy Lean Clay w/ Cinders
29483	SS1-21 / North Stockpile	38	22	16	CL-Sandy Lean Clay
29550	SS1-22 / South Stockpile	43	21	22	CL-Lean Clay w/ Sand

Determinations of the distribution of particle sizes in samples of subsurface and stockpile soils were made in accordance with AASHTO Designation T 88, Standard Method of Particle Size Analysis of Soils. The composition of each of these samples is presented in Table 2.

TABLE 2
PARTICLE-SIZE DATA

Lab No.	Source/ Soil Type	Percent Gravel (Greater than 4.76 mm)	Percent Sand (0.074-4.76 mm)	Percent Silt (0.002-0.074 mm)	Percent Clay (Less than 0.002 mm)
29479	Composite / Alluvium	0	3	77	20
29480	SS1-5 (0'-5'), SS1-15 (5'-8') / Alluvium	0	2	72	26
29481	SS1-9 (2'-6') / Alluvium	0	7	63	30
29482	SS1-11 (0'-3.5') / Fill	3	42	37	18
29483	SS1-21/North Stockpile	1	28	54	17
29550	SS1-22/South Stockpile	5	20	53	22

The moisture-density relations of representative samples of subsurface and stockpile soils were determined in accordance with ASTM D 698, Procedure A, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf./ft^3) (600 kN-m/m^3). A summary of the test results are presented in Table 3, and the complete test reports are presented in Appendix E.

TABLE 3
MOISTURE-DENSITY RELATIONS TEST DATA

Lab No.	Source/ Soil Type	Group Symbol	Sand Content %	Maximum Dry Unit Weight, lbf/ft^3	Optimum Moisture Content, %
29479	Composite Sample / Lean Clay Alluvium	CL	3	104.0	17.0
29480	SS1-5 (0'-5'), SS1-15 (5'-8') / Lean Clay Alluvium	CL	2	98.0	21.0
29481	SS1-9 (2'-6') / Lean Clay Alluvium	CL	7	97.0	21.5
29482	SS1-11 (0'-3.5') / Fill - Sandy Lean Clay w/ Cinders	CL	45	92.0	23.0
29483	SS1-21 / North Stockpile Sandy Lean Clay	CL	29	103.0	17.0
29550	SS1-22 / South Stockpile Lean Clay w/ Sand	CL	25	98.5	19.5

GEOLOGY AND SITE CONDITIONS

The City of Lincoln lies in the Dissected Till Plains section of Nebraska, a part of the Central Lowland province of the Interior Plains physiographic division[1]. The project site is located in west-central Lincoln, Nebraska, on alluvial bottomlands adjacent to Salt Creek. The bottomlands are a flood plain setting consisting of relatively deep deposits of alluvium.

The subsurface materials encountered to the proposed depth of excavation (i.e., to depths of approximately 1.1 to 7.9 feet below existing grade) at the boring locations performed within the flood storage area generally consisted of alluvially deposited soils. The alluvial deposits consist of interbedded relatively thin layers of cohesive soils comprised of silts, clayey silts, lean clays, clays, lean clays with sand and sandy lean clays; and granular soils comprised of clayey sands, silty sands and fine sandy materials. A bed of alluvially deposited, SP-SM fine sand was encountered at boring location SS1-11 from 3.0 to 6.0 feet below existing grade. Additionally, a 0.4 foot thick layer of clayey sand was encountered at boring location SS1-13 from 0.4 to 0.8 feet below existing grade.

Fill materials were encountered at boring locations SS1-9, SS1-10, SS1-11, SS1-12, SS1-13 and SS1-18 to depths of 1.8, 1.0, 3.0, 0.8, 0.4 and 4.0 feet, respectively, below existing grade. These fill materials generally consisted of sandy lean clay soils with some concrete, brick and wood. Layers of cinders 0.5 to 0.6 feet thick were logged within the fill at boring locations SS1-10 and SS1-11. Reference should be made to the boring logs for more explicit definition of the fill materials encountered at boring locations SS1-9 thru SS1-13.

During the performance of the excavation operations that resulted in the creation of the two stockpiles of soil to the south of the "O" Street overpass, rubble generally consisting of concrete and bricks was encountered. An attempt was made to remove pieces of rubble larger than approximately 6 inches from the soils placed within these two stockpiles. The removal of rubble larger than 6 inches in diameter will continue for the future excavated soils that will be stockpiled within either of the two stockpiles to the south of the "O" Street overpass, or in the stockpile that is being constructed on the north parking lot area.

The soils encountered at the boring locations performed within both the flood storage area and within the two south stockpiles have moisture contents that range from wet to saturated. The results of visual inspection and laboratory tests indicated that a large percentage of the soils encountered at the boring locations are in a very wet to near saturated condition.

DISCUSSION AND RECOMMENDATIONS

As discussed in the previous section, a majority of the subsurface materials encountered at boring locations SS1-1 through SS1-20, and at the borings performed within the two stockpiles, consist of cohesive alluvial deposited soils. Fill containing some rubble was encountered within the stockpiles and at boring locations SS1-9 through SS1-13. An attempt was made and is continuing to be made to remove rubble larger than 6 inches in diameter before stockpiling materials. Three layers of cinders, approximately 0.5 feet thick each, were encountered within the fill at boring locations SS1-10 and SS1-11. The cinders in themselves are not considered suitable for reuse as controlled (compacted) earth fill. However, the cinders may be used within the fill if they are uniformly blended with cohesive soil such that the blended material contains no more than 25% cinders. With the exception of any organic materials (none of which were encountered at the boring locations), topsoil, the concrete and brick rubble larger than 6 inches in diameter, and cinders containing less than 75% soil admixture; all remaining soils that will be excavated and stockpiled are considered suitable for reuse as controlled earth fill when performing the grading operations on the Arena and other building and pavement areas between the Arena and the "O" Street overpass.

Based on the results of the laboratory testing, more than two-thirds of the soils that have been and will be excavated and stockpiled from the flood storage area will require drying to achieve the degree of compaction specified (density equal to or greater than 98% of the Maximum Dry Density per ASTM D 698) for fill and backfill materials constructed within the proposed building and pavement areas. Comparison of the moisture contents versus proctor moisture-density results would indicate that very wet to near saturated soils would require an average reduction in moisture content of 4 to 5 percent to achieve the degree of compaction specified for backfill and fill, and over a 10 percent reduction for some of the saturated soils.

Procedures for Drying Soil

Procedures often utilized to dry wet soils in order to meet the specified degree of compaction include the following:

A. Disc Harrow – Consists of working a lift of soil whose loose lift thickness does not exceed the depth that a disc harrow can fully penetrate. The disc should be used to repeatedly work the soil to aerate and reduce its moisture content to the degree required to achieve the specified degree of compaction.
B. Fly Ash Admixture – Consists of applying and uniformly blending fly ash into the wet soil. The anticipated quantity of fly ash that would need to be added to the wet soil is 10% to 15% by total dry weight of soil.
C. Lime Admixture – Consists of applying and uniformly blending lime into the wet soil. The anticipated quantity of lime that would need to be added to the wet soil is 3% to 4% by total dry weight of soil.

The fly ash or lime should be applied and blended into the soils in a uniform manner. The mixture should cure until the moisture content has reduced sufficiently to allow proper compaction and the preparation of a stable subgrade. Approximately four to ten hours curing time might be necessary to adequately cure either a fly ash/soil or lime/soil mixture. After curing, the mixture should be compacted to the required density.

It is Benesch's understanding that the quantity of soils that are being excavated and stockpiled from the flood storage areas on the BNSF West Haymarket Grading and Utilities Project for Track Relocation comprise less than one-half the soils required as backfill and fill for the structures and pavement being developed on the West Haymarket Arena and adjacent sites. Additional fill obtained from off-site borrow pits will be required to complete the required grading operations. Benesch recommends that the materials that have been and are being stockpiled from the flood storage area excavations be utilized to construct the lower portion (i.e., greater than 3 to 4 feet below finished floor or pavement subgrade level) of compacted backfill and fill constructed on the West Haymarket Arena, adjacent building pads and pavement areas.

CONCLUSIONS

Benesch concludes, on the basis of the findings of the subsurface exploration at the project site and the evaluation of the engineering properties of samples of the subsurface and stockpile soils, that the majority of the soils that have been or will be excavated and stockpiled from the flood storage area are suitable for re-use during the construction of compacted backfill or fill within the Arena and other building and pavement areas to the south of the Arena (up to the "O" Street overpass). Concrete, brick and other rubble greater than 6 inches in diameter, organic soils, and cinders containing less than 75% soil admixture are not recommended for reuse as fill and backfill.

Those excavated and stockpiled soils that are considered suitable for reuse as fill and backfill are presently in a very wet to near saturated state. Approximately two-thirds of the excavated/stockpiled soils will require drying to achieve the degree of compaction specified (density equal to or greater than 98% of the Maximum Dry Density per ASTM D 698) for fill and backfill materials constructed within the proposed building and pavement areas. Recommendations have been provide for drying out the soils.

The opinions and recommendations presented in this report are based in part upon Benesch's analyses of the data from the soil borings and laboratory tests performed for the project. The boring logs and related information depict subsurface conditions only at the specific boring locations and at the time of the subsurface exploration. Soil conditions may differ between the exploratory borings and will change with time from when they are excavated and transport to the stockpiles and subsequently transported to the building and pavement areas. The nature and extent of variations in soil conditions between the borings and in the stockpiles might not be evident until grading operations have begun. Contractors should perform their own personal assessment of the reusability (as backfill and fill) of stockpiled materials from the flood storage area grading, taking into consideration the time frame and construction season when the grading operations will be performed for the West Haymarket Arena and adjacent structures and paved areas.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices for exclusive use by City of Lincoln for specific application to the proposed West Haymarket project. The recommendations of this report are not valid for any other purpose. Benesch should be contacted if any questions arise concerning this report. This report shall not be reproduced, except in full, without the written approval of Alfred Benesch & Company.

Prepared By:

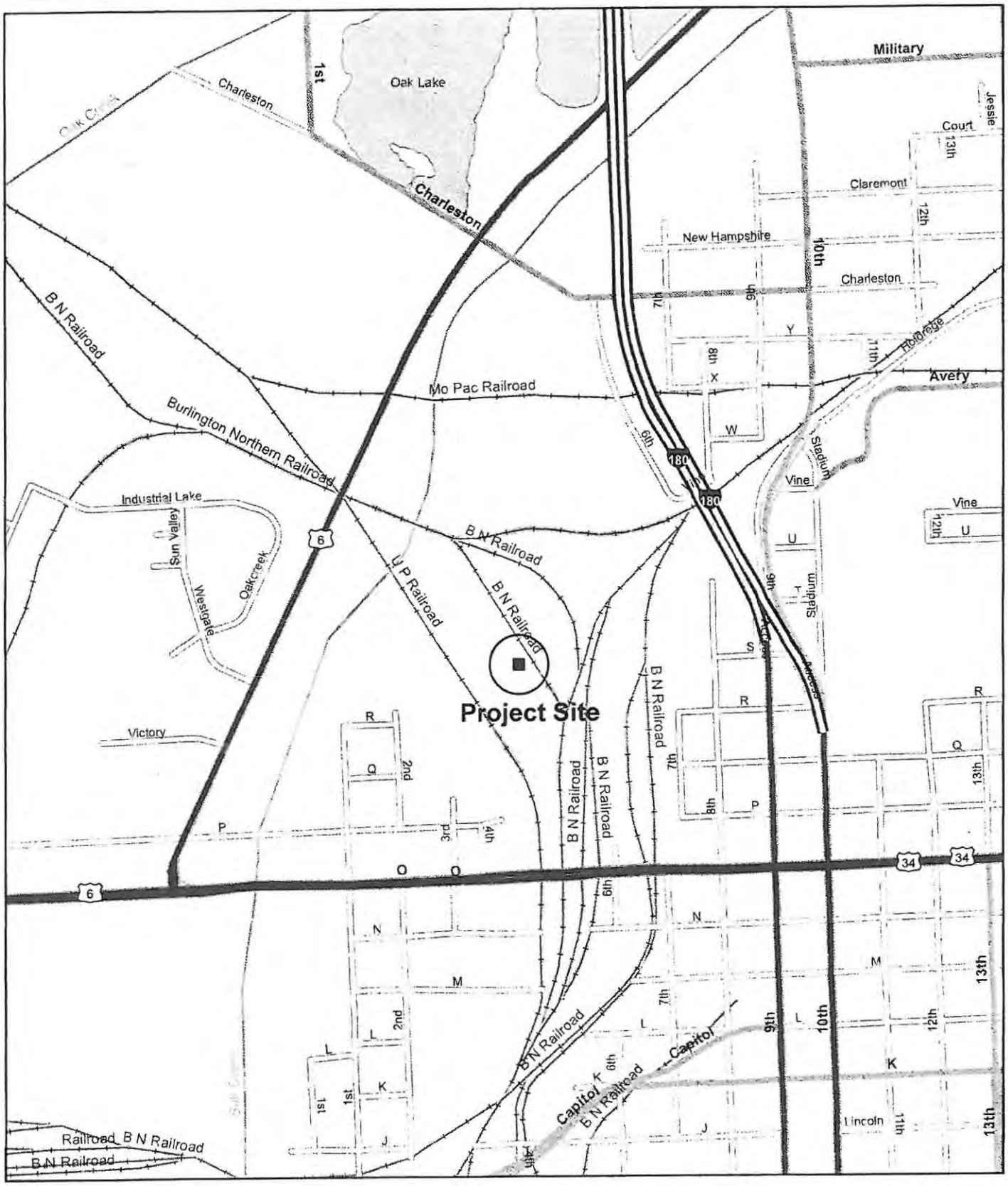
Jason E. Herr, P.E.

Reviewed By:

Gary E. Proskovec, P.E.

V-2015NorthSoilSurveyReport.docx
00110208.00-00001
Orig.: City of Lincoln
1cc.: Olsson Associates

APPENDIX A. VICINITY MAP AND BORING LOCATION PLAN



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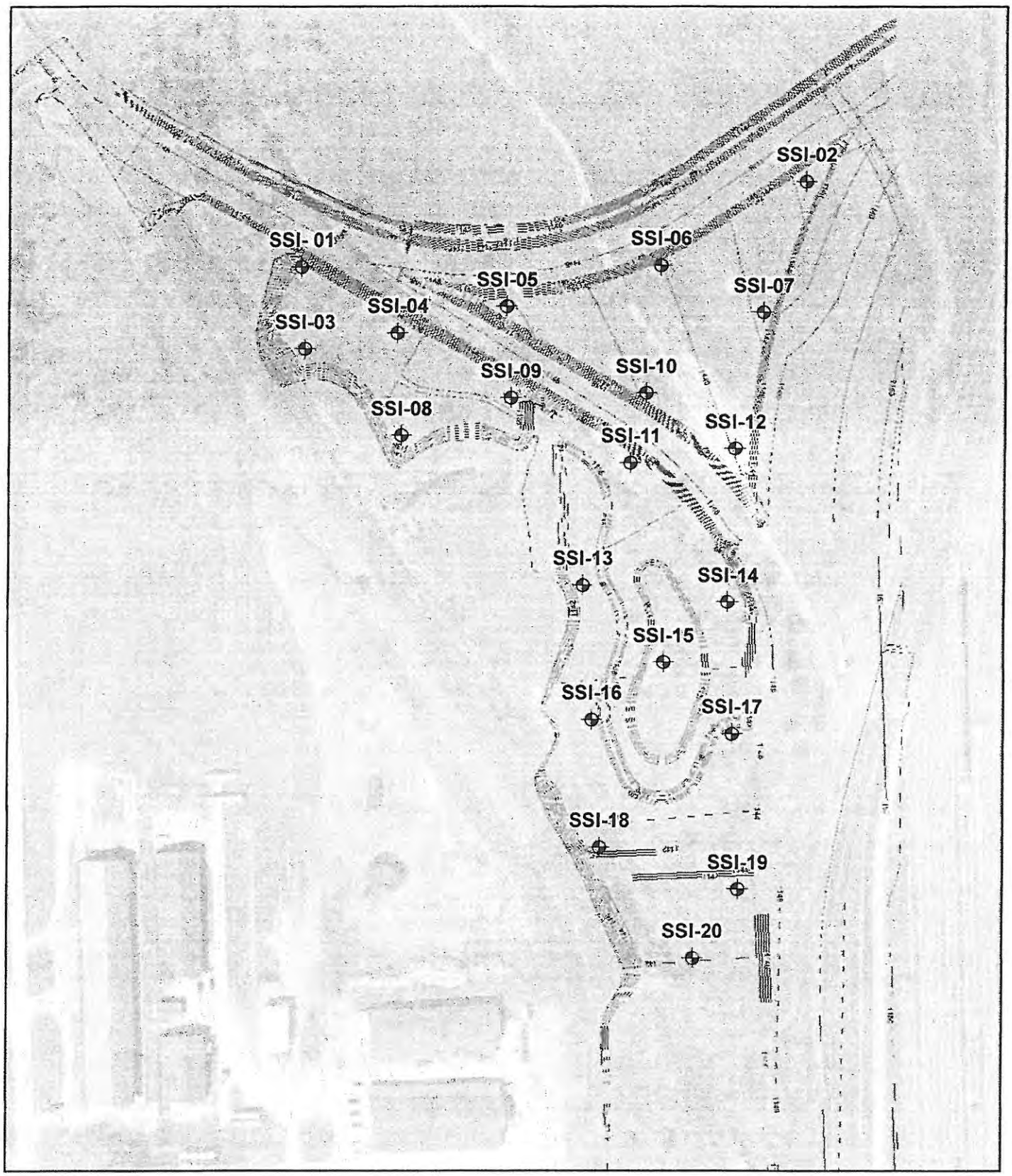
N
W E
S

1,000 500 0 1,000
Feet

Flood Storage Area Soil Survey
West Haymarket Project
Lincoln, Nebraska

Vicinity Map
Figure A-1



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N
W E
S

200 100 0 200
Feet

Flood Storage Area Soil Survey
West Haymarket Project
Lincoln, Nebraska

Boring Location Plan
Figure A-2

APPENDIX B. DUTCH FRICTION-CONE PENETRATION DIAGRAMS

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-1**
Location: **SS1-1**
Surface Elevation: **1143.7 feet**

Date: **3/3/2011**
Tested By: **CL**
Recorded By: **PN**

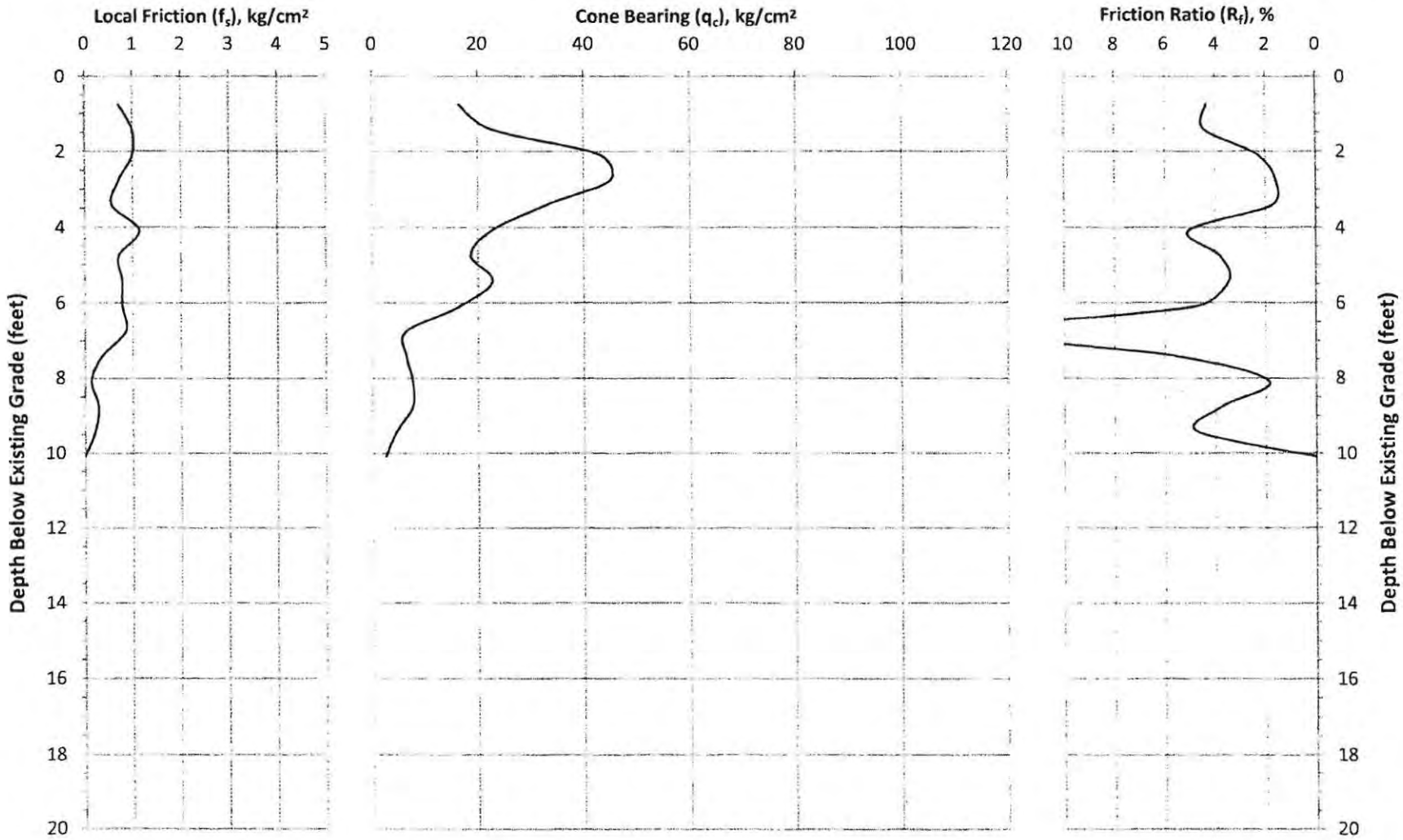

Figure B-1a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-2**
Location: **SS1-2**
Surface Elevation: **1147.9 feet**

Date: **3/3/2011**
Tested By: **CL**
Recorded By: **PN**

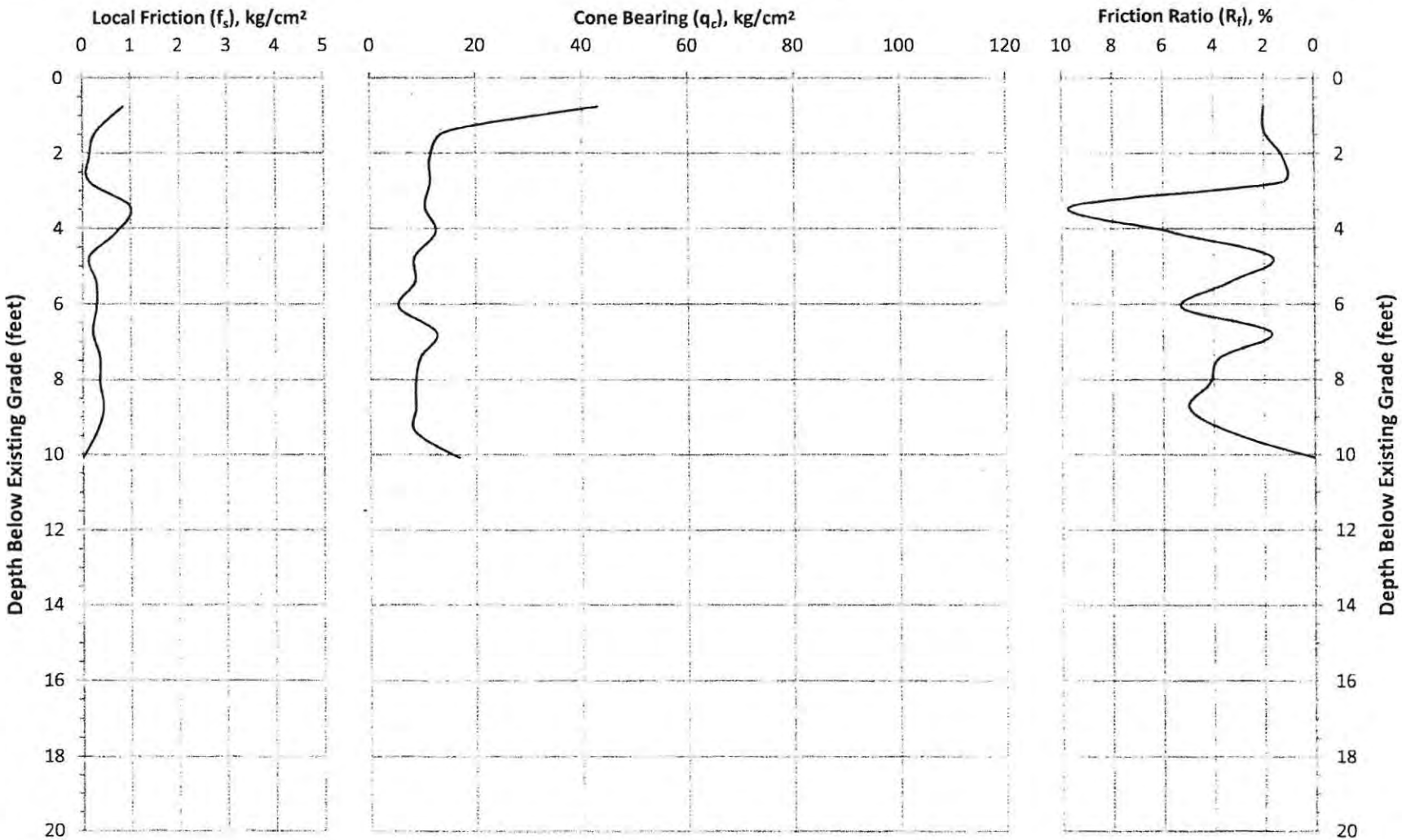

Figure B-2a

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ASTM D3441

Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-3**
Location: **SS1-3**
Surface Elevation: **1143.2 feet**

Date: **3/3/2011**
Tested By: **CL**
Recorded By: **PN**

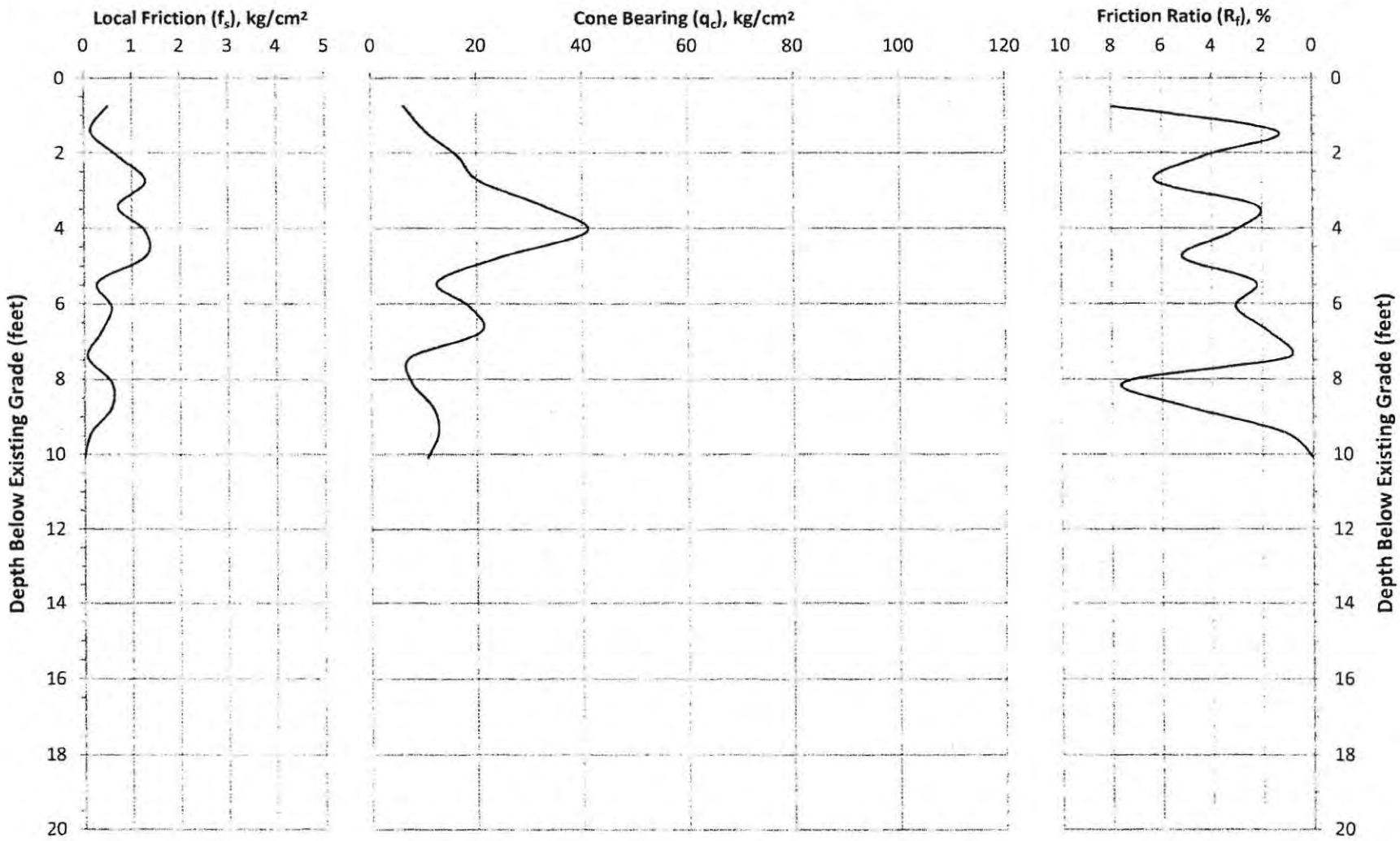

Figure B-3a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-4**
Location: **SS1-4**
Surface Elevation: **1143.2 feet**

Date: **3/4/2011**
Tested By: **CL**
Recorded By: **PN**

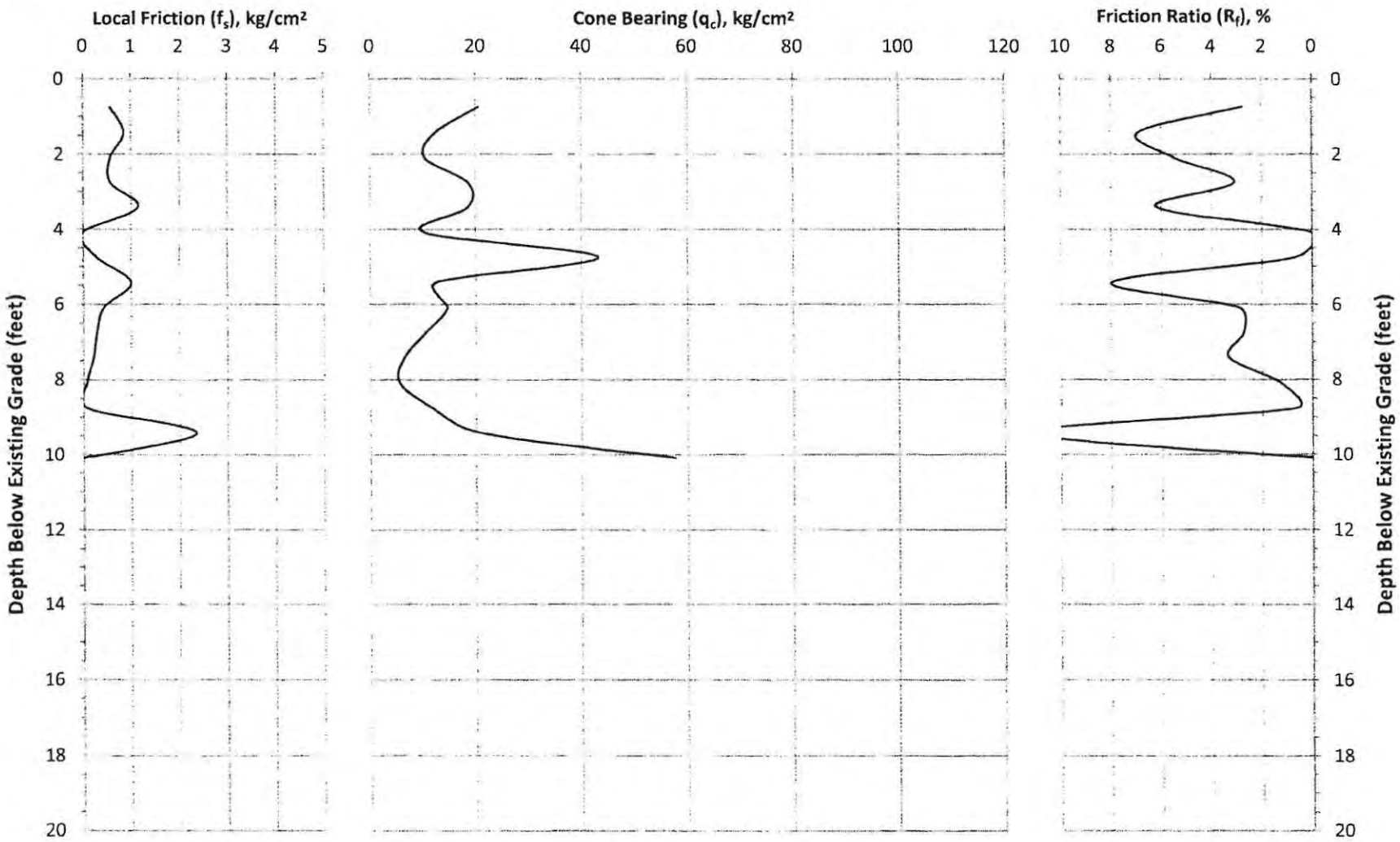

Figure B-4a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-5**
Location: **SS1-5**
Surface Elevation: **1145.8 feet**

Date: **3/3/2011**
Tested By: **CL**
Recorded By: **PN**

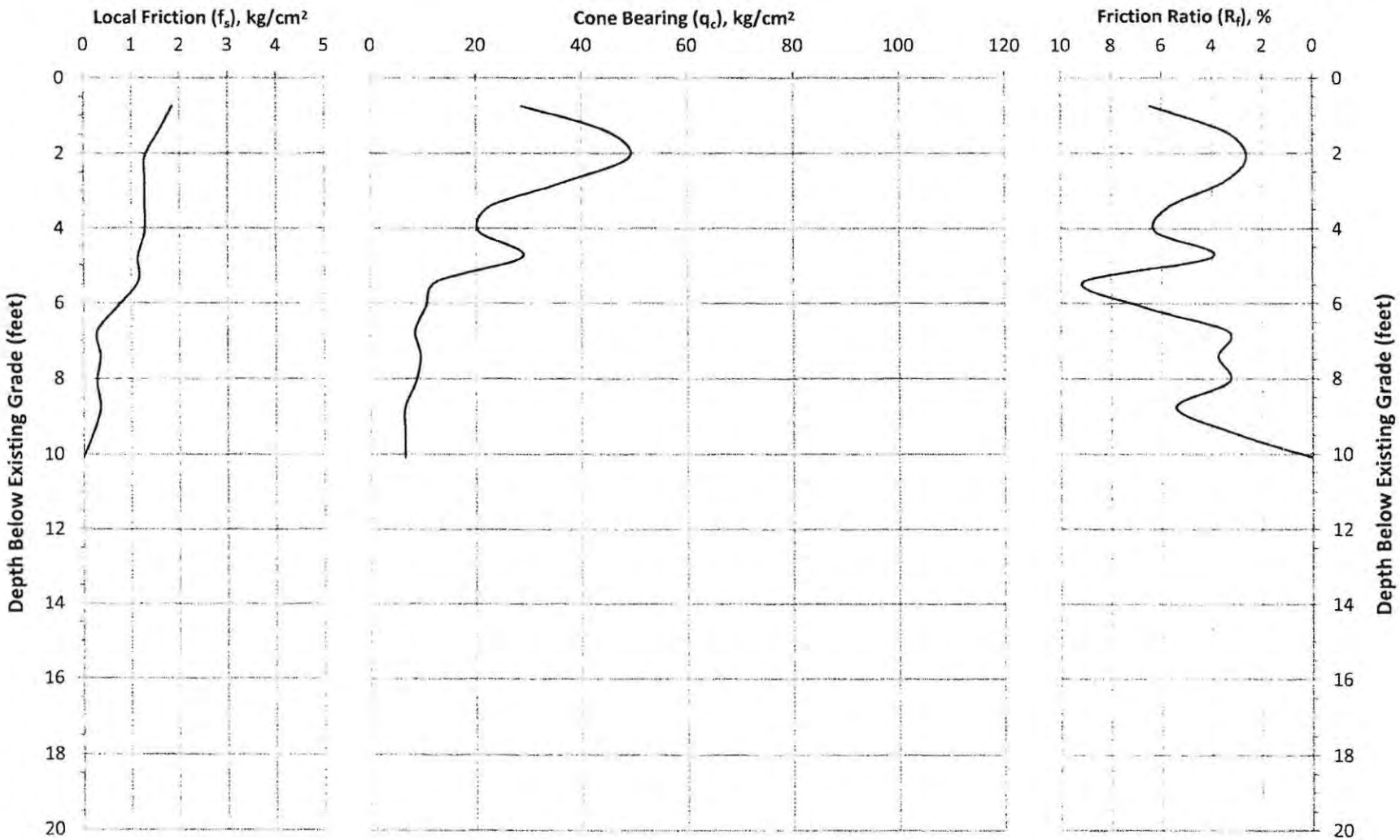

Figure B-5a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-6**
Location: **SS1-6**
Surface Elevation: **1147.8 feet**

Date: **3/3/2011**
Tested By: **CL**
Recorded By: **PN**

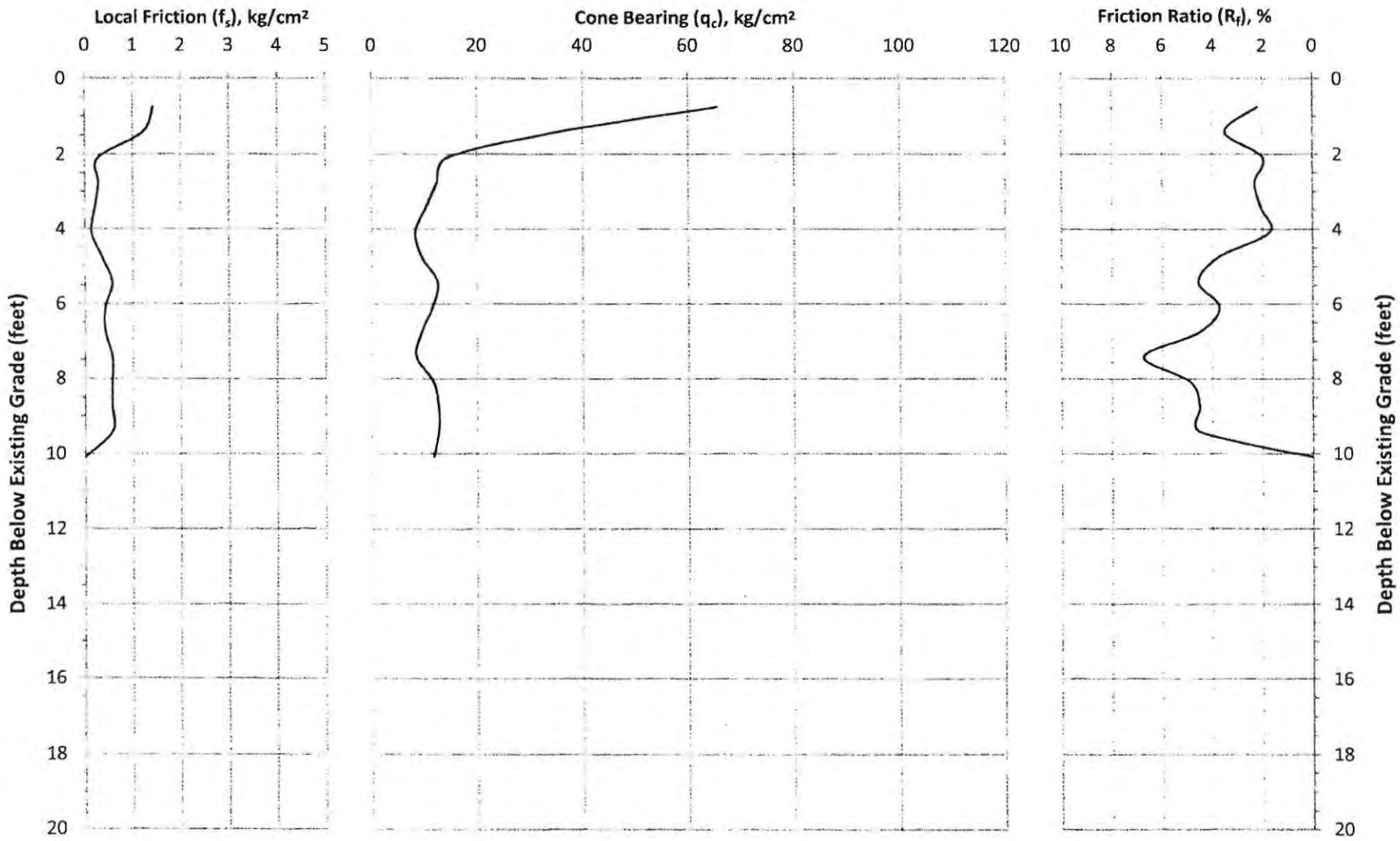

Figure B-5a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-7**
Location: **SS1-7**
Surface Elevation: **1147.8 feet**

Date: **3/3/2011**
Tested By: **CL**
Recorded By: **PN**

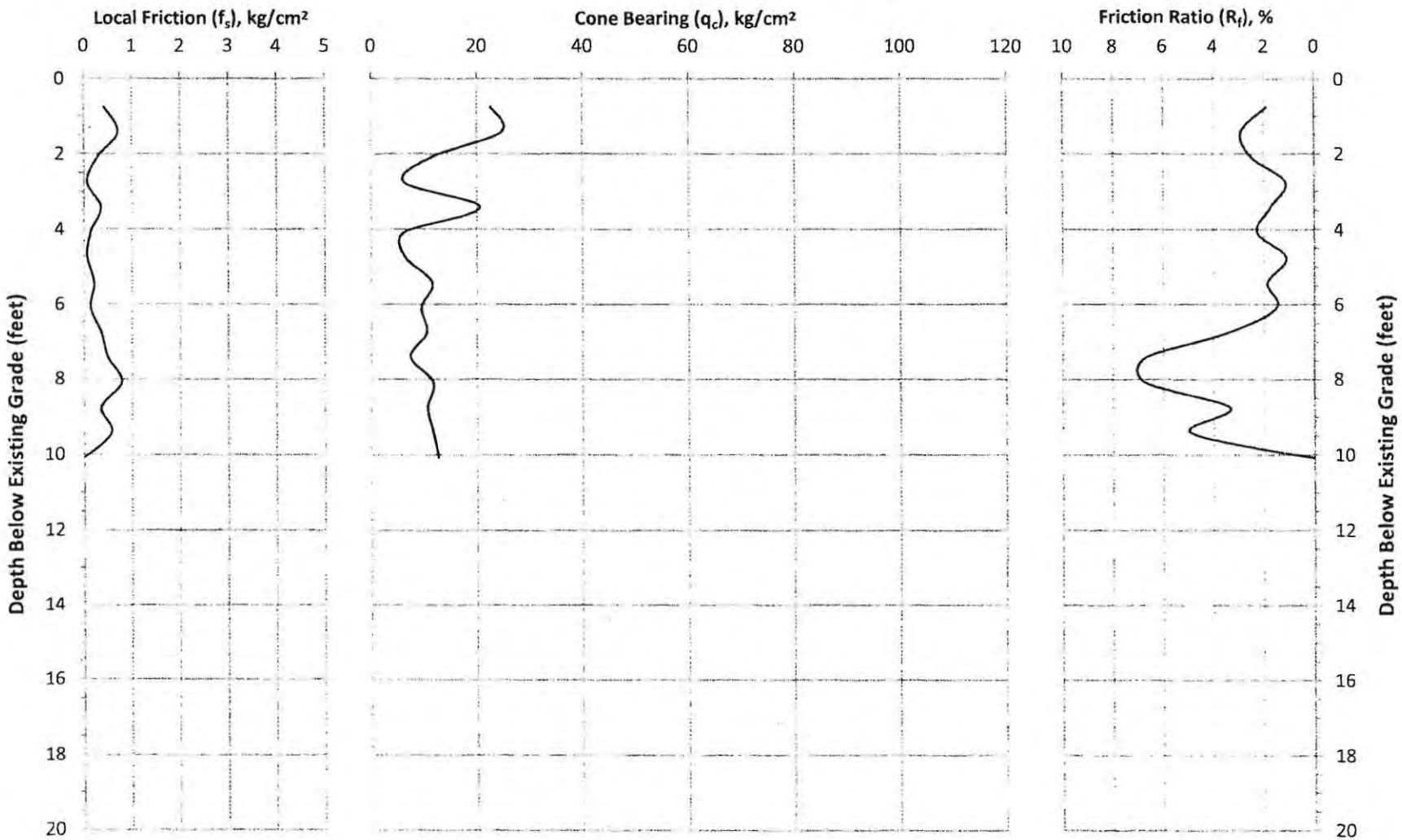

Figure B-6a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

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Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-9**
Location: **SS1-9**
Surface Elevation: **1144.1 feet**

Date: **3/4/2011**
Tested By: **CL**
Recorded By: **PN**

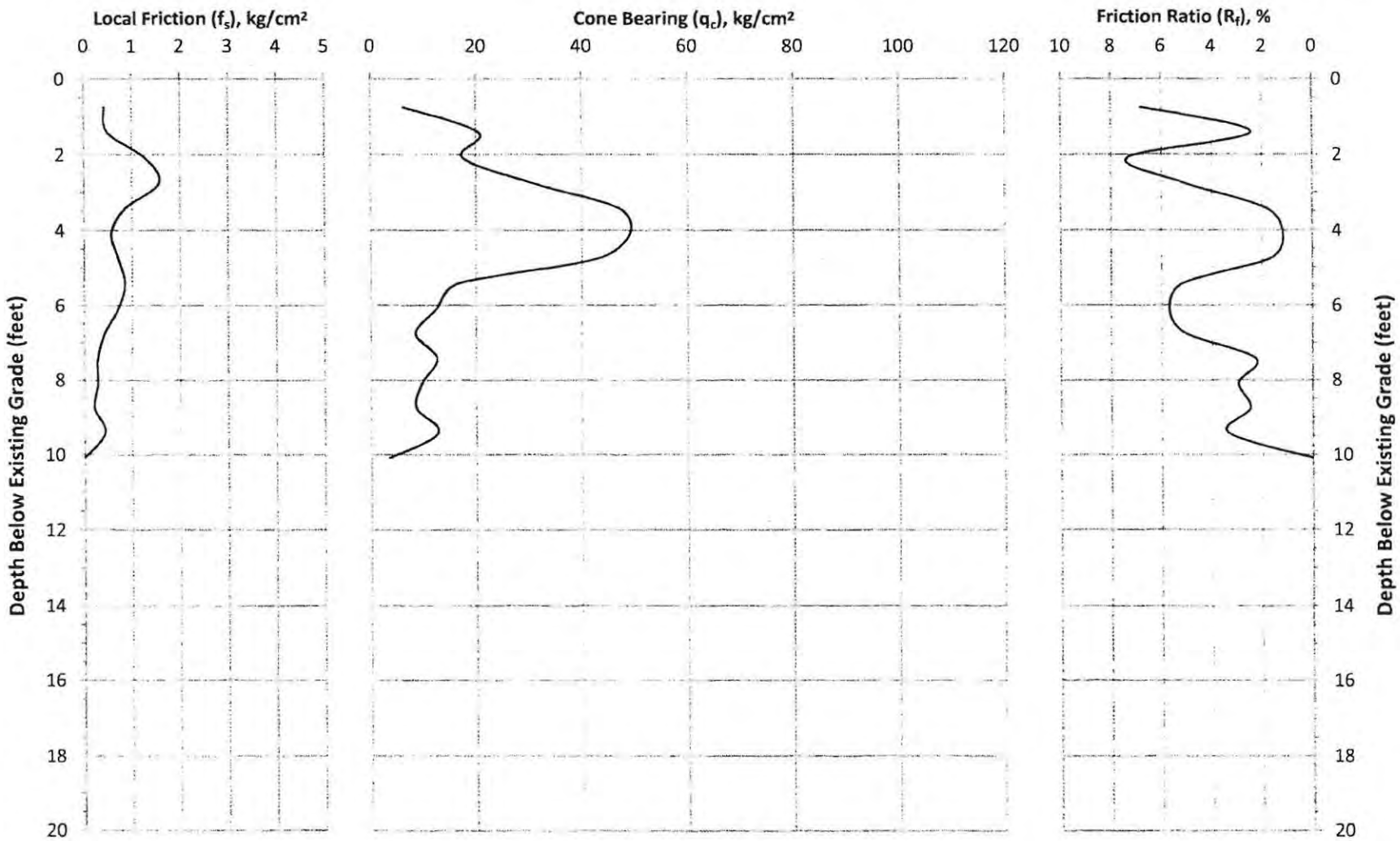

Figure B-9a

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Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-10**
Location: **SS1-10**
Surface Elevation: **1146.4 feet**

Date: **3/3/2011**
Tested By: **CL**
Recorded By: **PN**

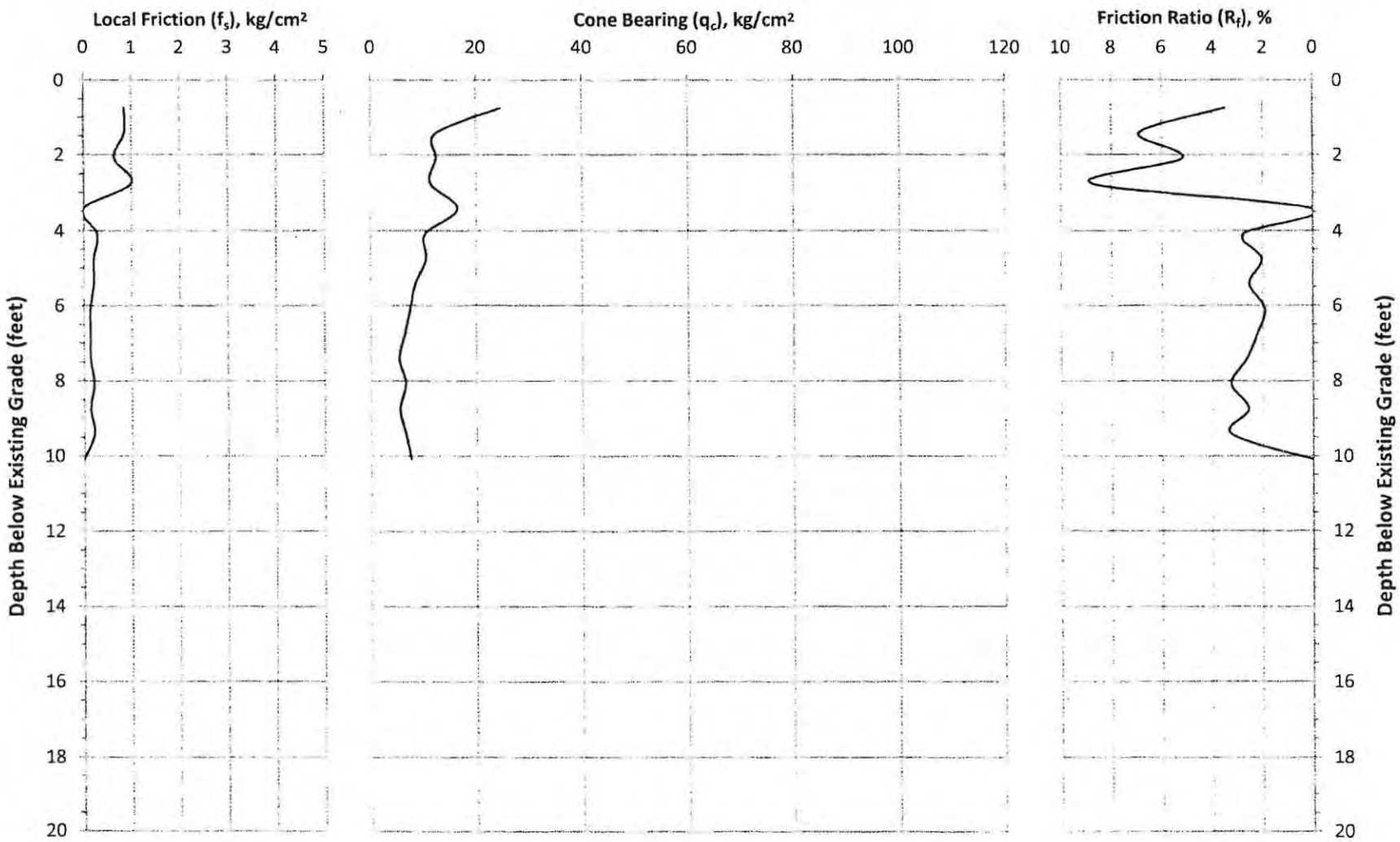

Figure B-7a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-11**
Location: **SS1-11**
Surface Elevation: **1145.7 feet**

Date: **3/3/2011**
Tested By: **CL**
Recorded By: **PN**

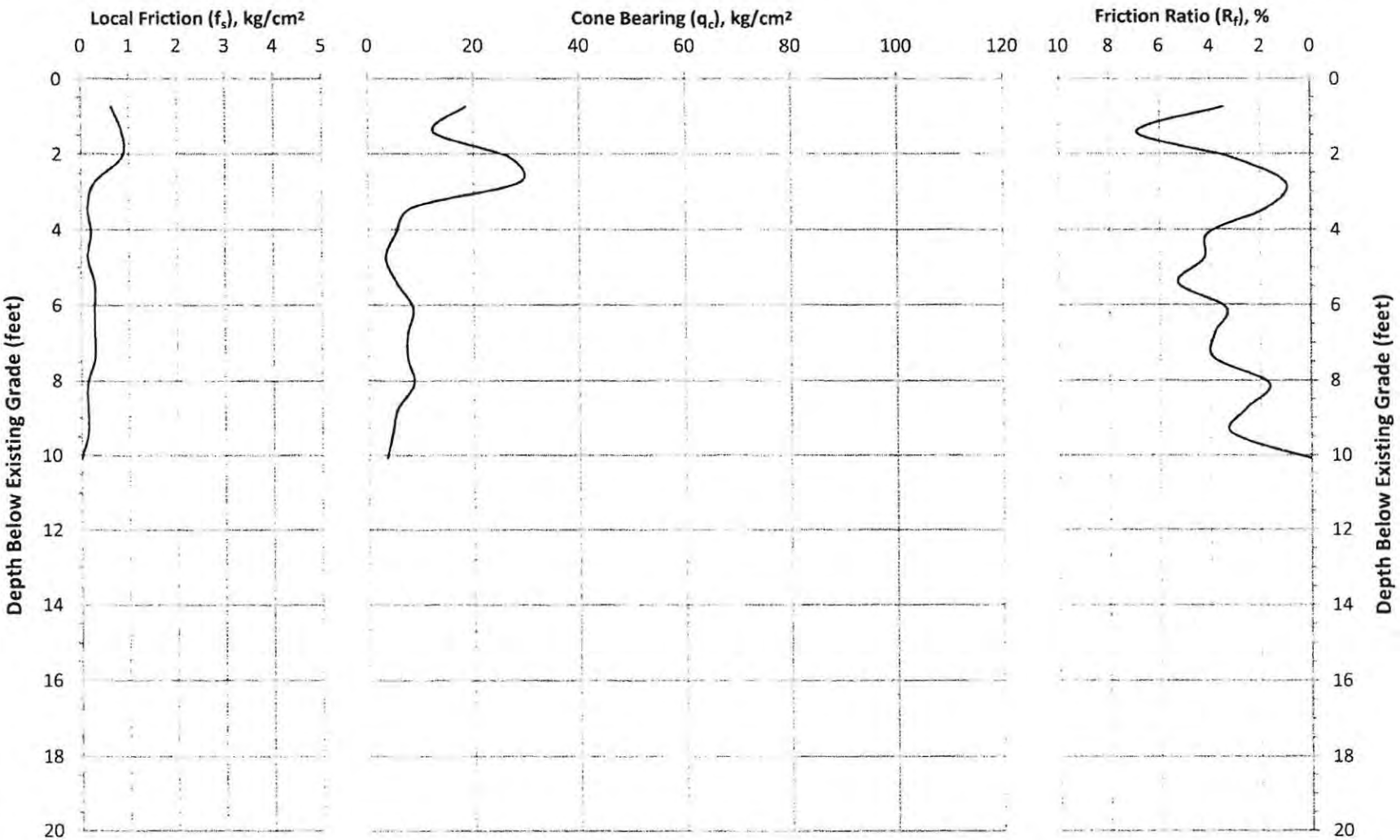

Figure B-8a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

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Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-12**
Location: **SS1-12**
Surface Elevation: **1147.9 feet**

Date: **3/3/2011**
Tested By: **CL**
Recorded By: **PN**

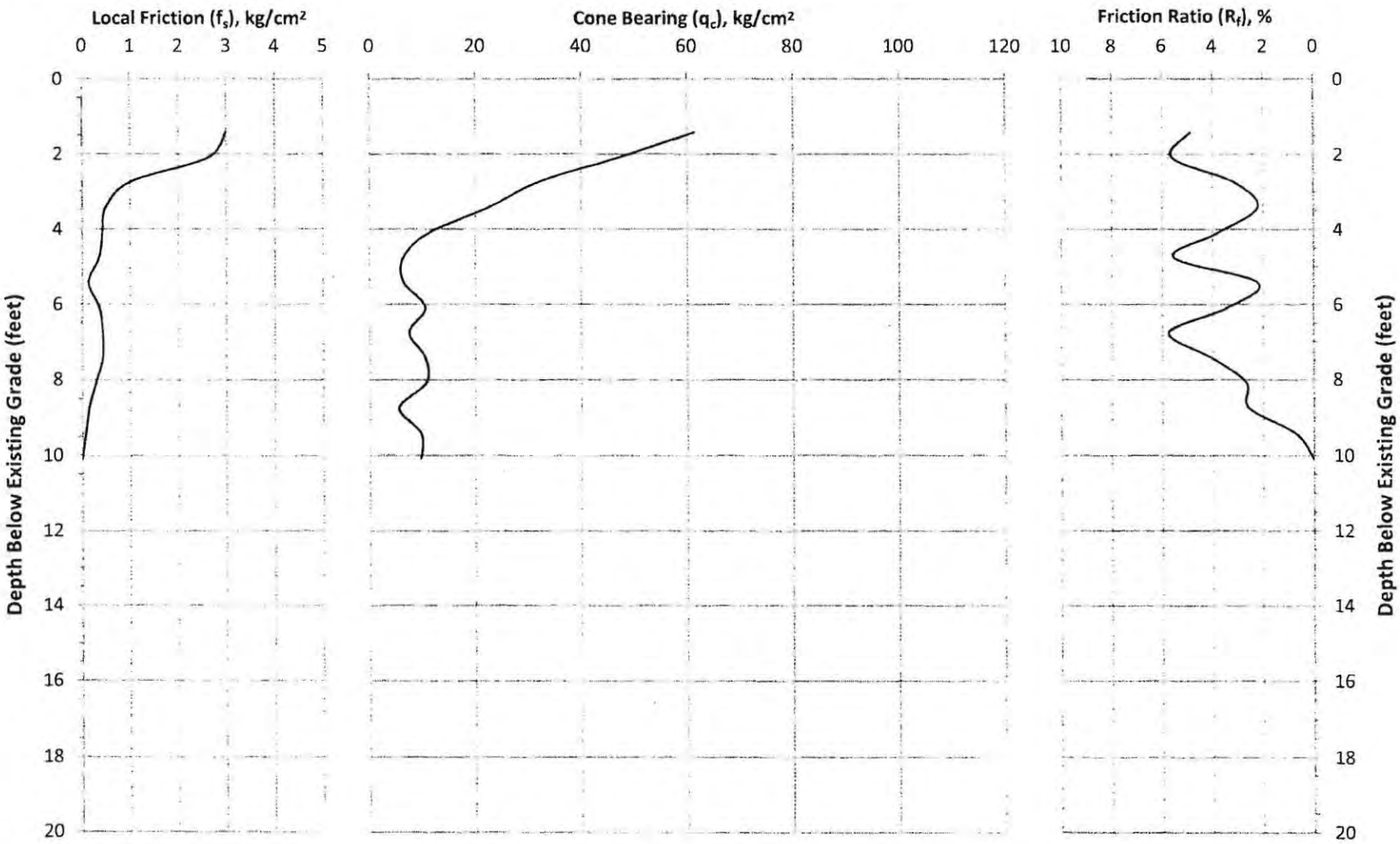

Figure B-9a

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Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-13**
Location: **SS1-13**
Surface Elevation: **1144.3 feet**

Date: **3/4/2011**
Tested By: **CL**
Recorded By: **PN**

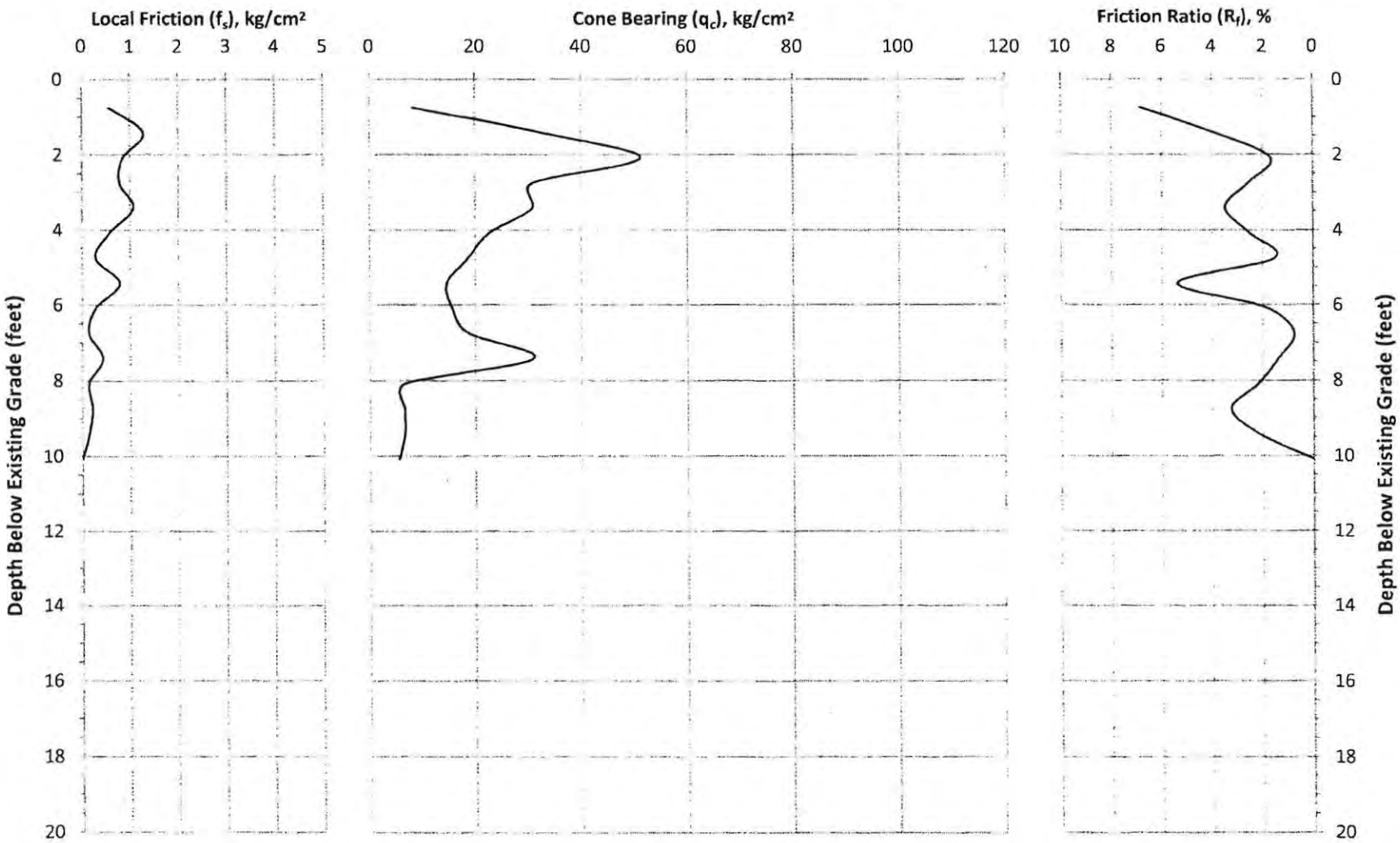

Figure B-13a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

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Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-14**
Location: **SS1-14**
Surface Elevation: **1142.9 feet**

Date: **3/4/2011**
Tested By: **CL**
Recorded By: **PN**

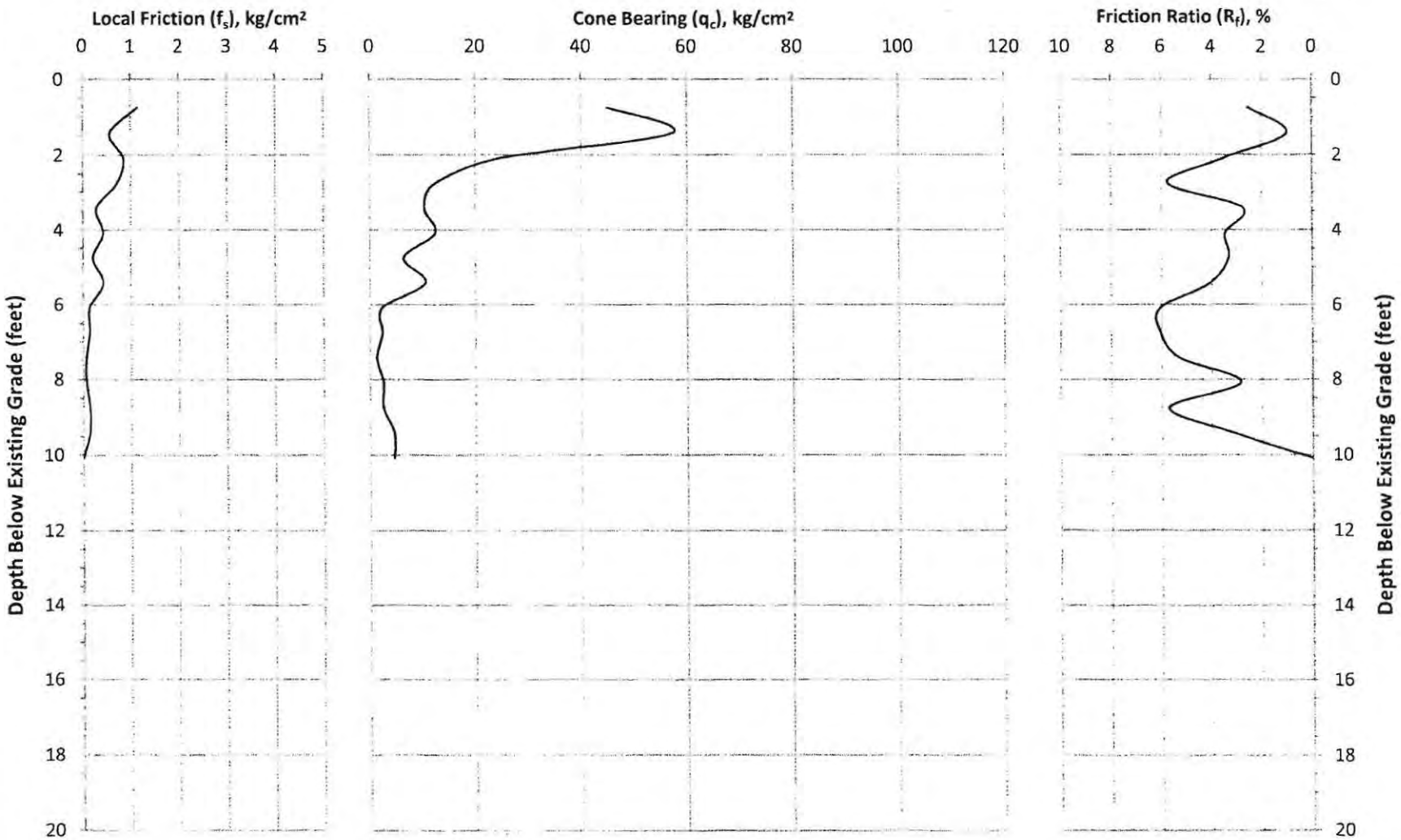

Figure B-14a

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Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-15**
Location: **SS1-15**
Surface Elevation: **1142.6 feet**

Date: **3/4/2011**
Tested By: **CL**
Recorded By: **PN**

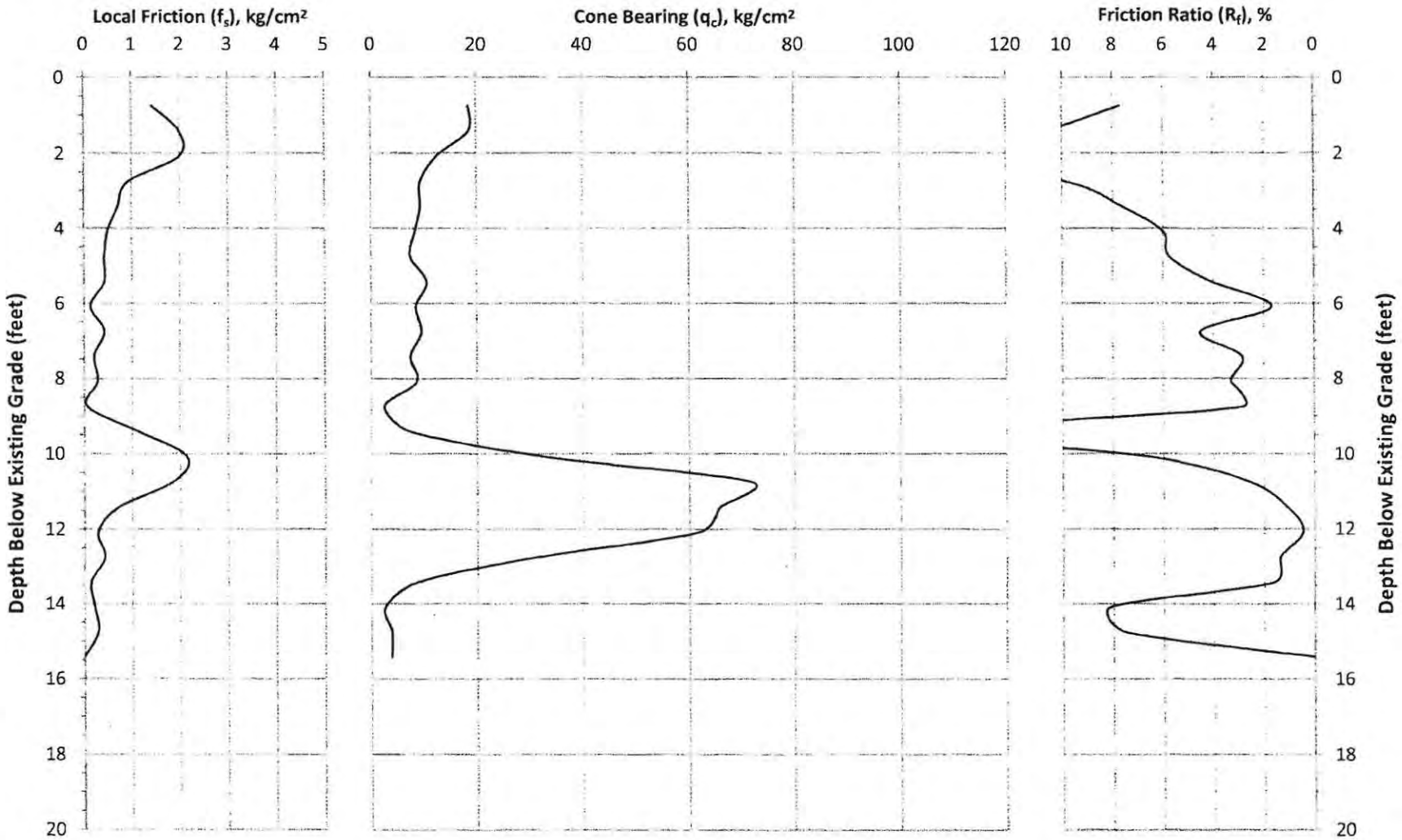

Figure B-15a

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Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-16**
Location: **SS1-16**
Surface Elevation: **1145.3 feet**

Date: **3/4/2011**
Tested By: **CL**
Recorded By: **PN**

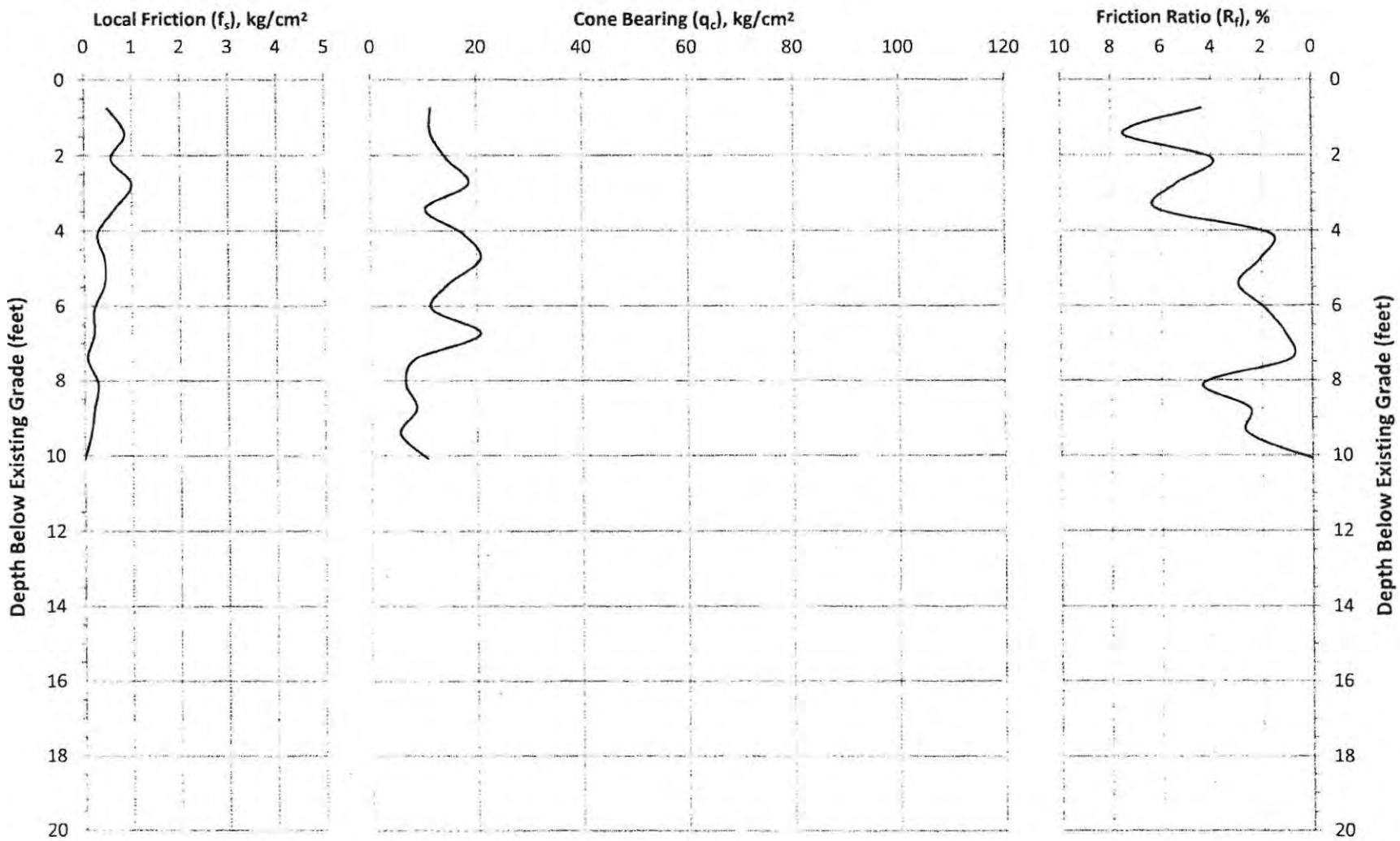

Figure B-16a

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ASTM D3441

Project Name: **Flood Storage Area Soil Survey**
Project Location: **Lincoln, NE**
Project Number: **110208.00**

Sounding No: **S-17**
Location: **SS1-17**
Surface Elevation: **1144.5 feet**

Date: **3/4/2011**
Tested By: **CL**
Recorded By: **PN**

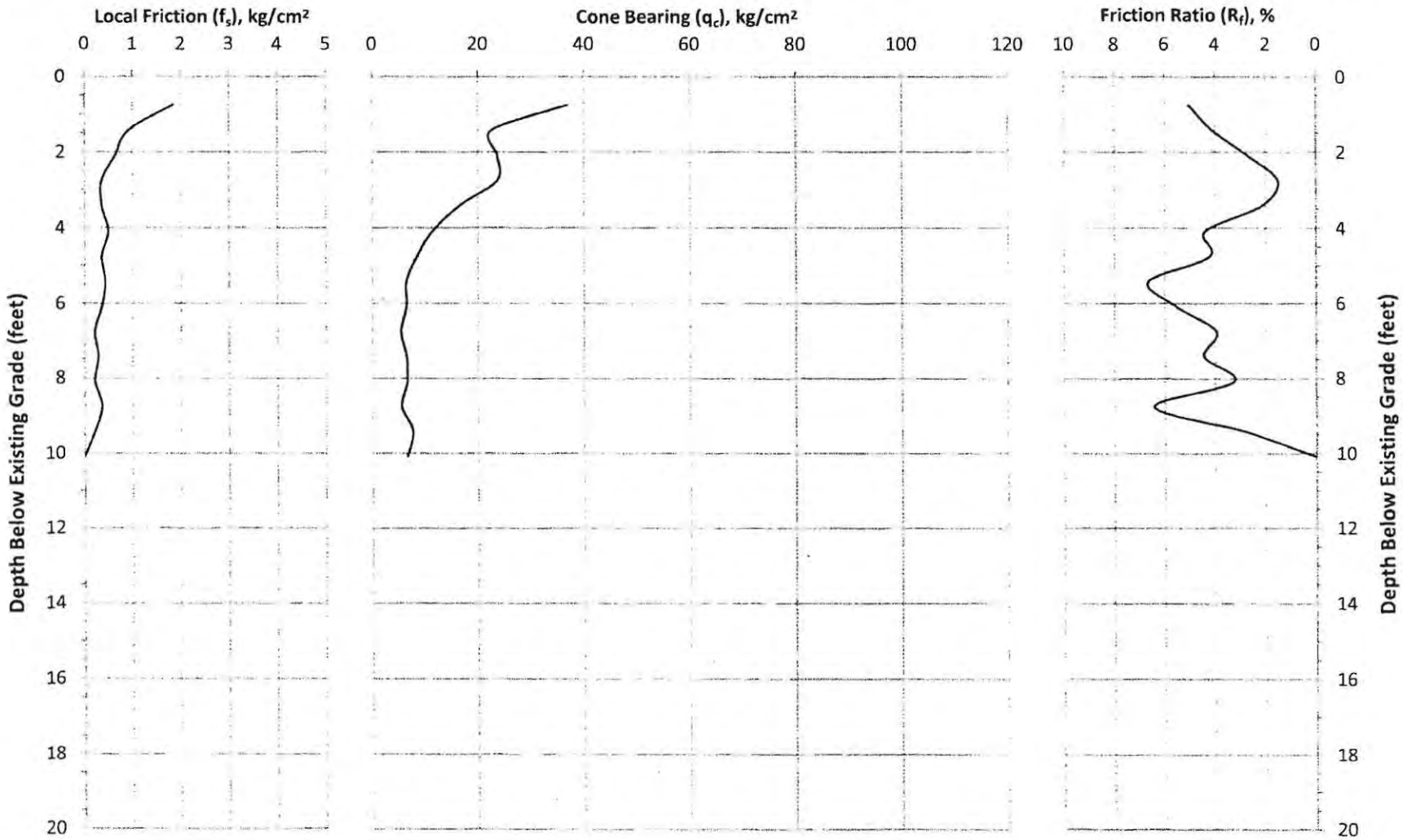

Figure B-17a

APPENDIX C. BORING LOGS

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N207286.571, E156026.676
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: NC & GBW

BORING LOG

BORING No.: SS1-01
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ∇ Cave-in 9.4'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1143.7	0.0		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; very dark gray with very dark grayish brown; wet; stiff to very stiff. (Alluvium)	1	22.7	0.0
1141.5	2.2		CL - LEAN CLAY; medium plasticity; very dark gray; very wet; very stiff. (Alluvium)		29.1	2.5
1140.2	3.5		CL - LEAN CLAY; medium plasticity; very dark gray; very wet; stiff. (Alluvium)		31.5	5.0
1137.7	6.0		CL/ML - SILTY CLAY; low to medium plasticity; grayish brown with dark grayish brown; saturated; medium stiff. (Alluvium)		32	7.5
					32.9	
1134.2	9.5		CL - LEAN CLAY; medium plasticity; dark gray; saturated; soft. (Alluvium)			
1133.7	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 01

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N207386.502, E156775.982
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & PN

BORING LOG

BORING No.: SS1-02
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▽ Cave-in 8.3'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1147.9	0.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark brown mottled with reddish brown; wet; stiff. (Alluvium)		25.7	0.0
1146.9	1.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; grayish brown mottled with light gray; wet to very wet; medium stiff; with silt seams. (Alluvium)		29.2	2.5
1143.4	4.5		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; very dark brown; very wet; soft to medium stiff. (Alluvium)			5.0
1141.4	6.5		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; gray; very wet to saturated; medium stiff. (Alluvium)		30.4	7.5
					27	
1137.9	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 02

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N207161.913, E156000.989
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: NC & GBW

BORING LOG

BORING No.: SS1-03
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ∇ Cave-in 8.0'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1143.2	0.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; stiff. (Alluvium)		26	0.0
1141.2	2.0		CL - LEAN CLAY; medium plasticity; very dark gray; wet to very wet; very stiff. (Alluvium)		26.1	2.5
1138.7	4.5		CL - LEAN CLAY; medium plasticity; very dark gray with light gray; wet to very wet; stiff; with few thin silt seams. (Alluvium)			5.0
1136.7	6.5		CL/ML - SILTY CLAY; low to medium plasticity; grayish brown with very dark grayish brown; very wet to saturated; soft to medium stiff. (Alluvium)		26.4	7.5
1134.7	8.5		CL - LEAN CLAY; medium plasticity; very dark grayish brown; saturated; medium stiff to stiff. (Alluvium)			
1133.2	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 03

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N207181.569, E156144.348
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: NC & GBW

BORING LOG

BORING No.: SS1-04
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▽ Cave-in 7.2'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1143.7	0.0		CL - LEAN CLAY; medium plasticity; black; wet; medium stiff; friable. (Topsoil)			0.0
1142.7	1.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; moist to wet; stiff. (Alluvium)			
1141.7	2.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; stiff. (Alluvium)		23.2	2.5
1139.2	4.5		CL - LEAN CLAY; medium plasticity; very dark gray with light gray; wet; soft to medium stiff; with silt seams. (Alluvium)		22.3	5.0
1137.7	6.0		CL/ML - SILTY CLAY; low plasticity; dark grayish brown; very wet to saturated; soft. (Alluvium)		29.5	7.5
1135.7	8.0		CL/ML - SILTY CLAY; low plasticity; dark grayish brown mottled with dark yellowish red; saturated; soft; with sandy silt seams. (Alluvium)			
1135.2	8.5		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; soft. (Alluvium)			
1134.7	9.0		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; very pale brown; saturated; loose. (Alluvium)		31.3	
1134.2	9.5		ML - SILT; low plasticity; dark gray; saturated; loose. (Alluvium)			
1133.7	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 04

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N207214.983, E156312.245
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & PN

BORING LOG

BORING No.: SS1-05

SHEET 1 of 1

DATE: 3-4-2011

WATER LEVELS ∇ Cave-in 8.9'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1145.8	0.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark gray; moist; very stiff. (Alluvium)			0.0
1143.8	2.0		CL - LEAN CLAY; same as above but wet to very wet with depth. (Alluvium)		20.7	2.5
1140.8	5.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark gray; very wet; stiff. (Alluvium)		27.2	5.0
1139.3	6.5		CL/ML - SILTY CLAY; low to medium plasticity; gray; very wet to saturated; soft to medium stiff. (Alluvium)		28.8	7.5
1135.8	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 05

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N207268.596, E156548.311
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & PN

BORING LOG

BORING No.: SS1-06
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ∇ Cave-in 8.9'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1147.8	0.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; light brown mottled with very pale brown; with silt seams; wet to very wet with depth; very stiff. (Alluvium)			0.0
1145.8	2.0		CL - LEAN CLAY; same as above except very wet; medium stiff. (Alluvium)		27.2	2.5
1142.8	5.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark brown; very wet; medium stiff. (Alluvium)		26.2	5.0 7.5
1138.8	9.0		CL/ML - SILTY CLAY; 5-15% fine to coarse sand; low to medium plasticity; gray; saturated; medium stiff. (Alluvium)		23	
1137.8	10.0		Boring Terminated at: 10.0ft			10.0 12.5 15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 06

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N207189.83, E156702.382
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & PN

BORING LOG

BORING No.: SS1-07
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▽ Cave-in 8.8'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1147.8	0.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; light brown mottled with very pale brown; with silt seams; wet to very wet with depth; stiff. (Alluvium)			0.0
1145.8	2.0		CL - LEAN CLAY; same as above except very wet; soft. (Alluvium)		26.6	2.5
1142.8	5.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark brown; very wet; medium stiff to stiff. (Alluvium)		29.1	5.0 7.5
1139.8	8.0		CL/ML - SILTY CLAY; low to medium plasticity; gray mottled with light gray; very wet to saturated; soft to medium stiff. (Alluvium)		26.9	
1137.8	10.0		Boring Terminated at: 10.0ft			10.0 12.5 15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 07

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N207023.038, E156144.397
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: NC & GBW

BORING LOG

BORING No.: SS1-08
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▼ 6.1 on 3-5-2011

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1142.0	0.0		CL - LEAN CLAY; medium plasticity; black; very wet; stiff; friable. (Topsoil)		33.3	0.0
1141.0	1.0		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; very dark gray; very wet; stiff. (Alluvial Terrace)			
1140.0	2.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; very wet; stiff. (Alluvium)		27	2.5
1139.0	3.0		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; very dark gray; wet; stiff to very stiff. (Alluvium)			
1138.5	3.5		CL - LEAN CLAY; medium plasticity; very dark gray; wet; stiff. (Alluvium)			
1138.0	4.0		CL - LEAN CLAY; medium plasticity; very dark gray; wet; stiff; with silt seams. (Alluvium)		21.9	
1137.5	4.5		CL/ML - SILTY CLAY; low to medium plasticity; grayish brown; wet to very wet; medium stiff. (Alluvium)			5.0
1136.5	5.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; very wet to saturated; loose. (Alluvium)			
1136.0	6.0	▼	CL/ML - SILTY CLAY; 10-15% fine sand; low to medium plasticity; dark grayish brown; saturated; soft. (Alluvium)		34.3	
1135.3	6.7		CL - LEAN CLAY; medium plasticity; dark grayish brown; saturated; soft to medium stiff. (Alluvium)			7.5
1133.5	8.5		CL/ML - SILTY CLAY; low to medium plasticity; dark grayish brown; saturated; soft; with thin sandy silt seams. (Alluvium)		38.4	
1132.5	9.5		CL - LEAN CLAY; medium plasticity; very dark grayish brown; saturated; soft to medium stiff. (Alluvium)			
1132.0	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 08

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N207075.325, E156312.357
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: NC & GBW

BORING LOG

BORING No.: SS1-09
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▼ 8.8 on 3-5-2011

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1144.1	0.0		CL - SANDY LEAN CLAY; 0-5% fine to coarse gravel; 30-40% fine to coarse sand; medium plasticity; very dark grayish brown with very dark gray; wet; stiff; with a trace of cobbles and brick (Fill)		25.9	0.0
1142.3	1.8		CL - LEAN CLAY; medium plasticity; very dark brown; wet; stiff. (Alluvium)			
1141.6	2.5		CL - LEAN CLAY; medium plasticity; very dark brown; wet; very stiff. (Alluvium)		24.1	2.5
						5.0
1138.1	6.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; very wet; medium stiff to stiff. (Alluvium)		31.3	
1136.6	7.5		CL - LEAN CLAY; medium plasticity; very wet to saturated; soft; with silt seams. (Alluvium)			7.5
1136.1	8.0		CL/ML - SILTY CLAY; low to medium plasticity; dark grayish brown with grayish brown; saturated; soft. (Alluvium)		39.8	
1134.1	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 09

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PROJECT: Flood Storage Area Soil Survey
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LOCATION: N207073.694, E156521.353
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: NC & GBW

BORING LOG

BORING No.: SS1-10
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▽ Cave-in 9.5'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1146.4	0.0		CL - SANDY LEAN CLAY; 40-50% fine to coarse sand; medium plasticity; very dark gray; wet; soft. (Fill)			0.0
1146.0	0.4		CINDERS; black; moist; medium dense. (Fill)		21.8	
1145.4	1.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; very wet; medium stiff. (Alluvium)		33.1	2.5
1143.2	3.2		ML - SILT; low plasticity; very pale brown with dark grayish brown; very wet; loose. (Alluvium)			
1142.7	3.7		CL - LEAN CLAY; medium plasticity; very dark grayish brown with light grayish brown; very wet; medium stiff; with abundant silt seams. (Alluvium)		33.9	
1141.4	5.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; very wet; medium stiff. (Alluvium)			5.0
1140.4	6.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; very wet; soft. (Alluvium)			
1139.9	6.5		CL/ML - SILTY CLAY; low to medium plasticity; very dark grayish brown; very wet; soft. (Alluvium)		30.6	7.5
1136.9	9.5		CL - LEAN CLAY; medium plasticity; very dark gray with light gray; saturated; soft; with silt seams. (Alluvium)			
1136.4	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 10

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LOCATION: N206970.283, E156493.238
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: NC & GBW

BORING LOG

BORING No.: SS1-11
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ∇ Cave-in 8.5'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1145.8	0.0		CL - SANDY LEAN CLAY; 0-5% fine to coarse gravel; 30-40% fine to coarse sand; medium plasticity; very dark gray; wet; very stiff; with a trace of brick and concrete rubble. (Fill)			0.0
1145.1	0.7		CINDERS; with 10-15% fine gravel; dark red; wet; loose. (Fill)			
1144.5	1.3		CL - SANDY LEAN CLAY; 0-5% fine to coarse gravel; 30-40% fine to coarse sand; medium plasticity; very dark gray; moist to wet; stiff. (Fill)		11	
1143.3	2.5		CINDERS; black; moist; loose. (Fill)			2.5
1142.8	3.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; dark yellowish red with dusky red; wet to very wet; very loose. (Alluvium)		11.7	
					12.4	5.0
1139.8	6.0		CL - LEAN CLAY; medium plasticity; very dark gray; very wet; medium stiff. (Alluvium)		27.5	
						7.5
1137.8	8.0		CL/ML - SILTY CLAY; low to medium plasticity; very dark gray; very wet to saturated; soft; with silt seams. (Alluvium)		28.2	
1135.8	10.0		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; medium stiff to stiff. (Alluvium)			10.0
1134.8	11.0		Boring Terminated at: 11.0ft			
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 11

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N206983.83, E156652.862
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: NC & GBW

BORING LOG

BORING No.: SS1-12
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▽ Cave-in 9.9'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1147.9	0.0		GC - CLAYEY GRAVEL with Sand; 50-60% fine gravel; 15-20% fine to coarse sand; medium plasticity; grayish brown; wet; medium dense. (Fill)		7.2	0.0
1147.1	0.8		CL/ML - SILTY CLAY; low to medium plasticity; very pale brown; wet; very stiff. (Alluvium)			
1145.8	2.1		CL/ML - SILTY CLAY; low to medium plasticity; very pale brown; wet; stiff; with thin clay seams. (Alluvium)		22.5	2.5
1143.9	4.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown with very dark gray; wet; soft to medium stiff; with abundant silt seams. (Alluvium)		25.4	5.0
					25	
1140.9	7.0		CL - LEAN CLAY; same as above but very wet to saturated. (Alluvium)		34.5	7.5
1137.9	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

Figure C - 12

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N206786.286, E156414.611
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: NC & GBW

BORING LOG

BORING No.: SS1-13
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ∇ Cave-in 8.1'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1144.3	0.0		CL/CH - LEAN TO FAT CLAY; 10-15% fine to coarse sand; medium to high plasticity; very dark grayish brown; very wet to saturated; medium stiff. (Fill)			0.0
1143.9	0.4		SC - CLAYEY SAND; 60-70% fine sand; medium plasticity; dark olive gray; saturated; loose. (Modern Alluvium)			
1143.5	0.8		CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; stiff. (Alluvium)		20.3	
1142.3	2.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; medium stiff; with abundant silt seams. (Alluvium)		14.5	2.5
1141.3	3.0		CL/ML - SILTY CLAY; low to medium plasticity; dark grayish brown with pale brown; wet to very wet; soft; with few thin clay seams. (Alluvium)		18	5.0
1137.3	7.0		CL/ML - SILTY CLAY; low to medium plasticity; grayish brown with brown; very wet to saturated; soft; with few thin clay seams. (Alluvium)		25.9	7.5
1135.0	9.3		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; grayish brown; saturated; loose. (Alluvium)			
1134.3	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 13

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N206752.156, E156634.415
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & PN

BORING LOG

BORING No.: SS1-14
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▼ 6.6 on 3-5-2011

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1142.9	0.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; brown mottled with dark brown; wet; stiff to very stiff. (Alluvium)		20.4	0.0
1140.9	2.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark brown mottled with dark gray; very wet; medium stiff. (Alluvium)		27	2.5 5.0
1136.9	6.0		CL/ML - SILTY CLAY with Sand; 20-30% fine to coarse sand; low to medium plasticity; dark brown mottled with gray; saturated; soft; with sand seams. (Alluvium)		34.5	7.5
1132.9	10.0		Boring Terminated at: 10.0ft			10.0 12.5 15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 14

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PROJECT: Flood Storage Area Soil Survey
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LOCATION: N206663.332, E156534.131
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & PN

BORING LOG

BORING No.: SS1-15
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▼ 6.2 on 3-5-2011

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1142.6	0.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; black slightly mottled with gray; wet to very wet; stiff. (Alluvium)		25.9	0.0
1139.6	3.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; gray; very wet; medium stiff. (Alluvium)		27.1	2.5
1137.6	5.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; gray; very wet to saturated; medium stiff. (Alluvium)			5.0
1136.4	6.2		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; gray; saturated; medium stiff. (Alluvium)		28.3	7.5
1134.6	8.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; black; saturated; medium stiff. (Alluvium)		29.1	
1132.6	10.0		SP-SM - POORLY GRADED SAND with Silt; 65-75% fine to coarse sand; nonplastic; light brown; saturated; loose. (Alluvium)		22.1	10.0 12.5
1129.1	13.5		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; very dark gray; saturated; soft. (Alluvium)		29.8	
1127.6	15.0		Boring Terminated at: 15.0ft			15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 15

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PROJECT: Flood Storage Area Soil Survey
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LOCATION: N206581.097, E156420.304
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & PN

BORING LOG

BORING No.: SS1-16
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▽ Cave-in 9.1'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1145.3	0.0		CL - LEAN CLAY; 5-15% fine to coarse sand; medium plasticity; dark brown; moist to wet; medium stiff. (Alluvium)		15.9	0.0 2.5
1141.3	4.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; light brown; wet; soft to medium stiff. (Alluvium)		19.8	5.0
1139.3	6.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; light brown; very wet to saturated; soft to medium stiff. (Alluvium)		30	7.5
1136.2	9.1		CL/ML - SILTY CLAY; same as above but saturated. (Alluvium)			
1135.3	10.0		Boring Terminated at: 10.0ft			10.0 12.5 15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 16

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PROJECT: Flood Storage Area Soil Survey
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LOCATION: N206551.381, E156634.496
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & PN

BORING LOG

BORING No.: SS1-17
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▼ 7.9 on 3-5-2011

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1144.5	0.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; light brown; wet to very wet; hard. (Alluvium)		15.5	0.0
1141.5	3.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; light brown; wet to very wet; hard. (Alluvium)		20.7	2.5
1138.5	6.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; light brown; very wet to saturated; hard. (Alluvium)			5.0
1136.6	7.9 ▼		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; light brown; saturated; hard. (Alluvium)		29.4	7.5
1134.5	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 17

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N206386.813, E156425.272
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: NC & GBW

BORING LOG

BORING No.: SS1-18
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ∇ Cave-in 4.9'

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1143.1	0.0		CL - SANDY LEAN CLAY; 10-15% fine to coarse gravel; 40-50% fine to coarse sand; medium plasticity; very dark gray with black; wet; medium stiff to stiff; with wood and brick. (Fill)			0.0
					20.5	
						2.5
1139.1	4.0		CH - FAT CLAY; high plasticity; black; very wet; very stiff. (Alluvium)			
1138.6	4.5		CL - LEAN CLAY; medium plasticity; dark grayish brown; very wet to saturated; soft; with silt seams. (Alluvium)			5.0
1137.6	5.5		CL - LEAN CLAY; medium plasticity; very dark grayish brown; saturated; medium stiff. (Alluvium)			
1136.6	6.5		CL - LEAN CLAY; medium plasticity; saturated; soft to medium stiff; with abundant silt seams. (Alluvium)		37.6	
						7.5
1135.1	8.0		CL/ML - SILTY CLAY; low to medium plasticity; very dark gray; saturated; soft; with clay seams. (Alluvium)			
1134.0	9.1				24.1	
1133.6	9.5		SC - CLAYEY SAND; 50-60% fine to medium sand; medium plasticity; dark gray; saturated; medium dense to dense. (Alluvium)			
1133.1	10.0		CL - LEAN CLAY; medium plasticity; gray; saturated; stiff. (Alluvium)			10.0
			Boring Terminated at: 10.0ft			
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 18

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N206315.942, E156634.391
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: NC & GBW

BORING LOG

BORING No.: SS1-19
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▼ 4.7 on 3-5-2011

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1141.3	0.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; medium stiff; with 5-10% fine to coarse sand and gravel. (Fill)			0.0
1140.8	0.5		CL - LEAN CLAY; medium plasticity; very dark grayish brown; very wet; stiff to very stiff. (Alluvium)		28.6	
1138.6	2.7		CL - LEAN CLAY; medium plasticity; very dark grayish brown; very wet; medium stiff. (Alluvium)		33.5	2.5
1137.1	4.2		CL/ML - SILTY CLAY; dark grayish brown; very wet to saturated; very soft; with silt seams. (Alluvium)		32.3	5.0
1134.3	7.0		CL - LEAN CLAY; medium plasticity; dark gray with gray; saturated; soft to medium stiff. (Alluvium)			7.5
1133.3	8.0		CL - LEAN CLAY; medium plasticity; dark gray with gray; saturated; medium stiff to stiff. (Alluvium)		30.9	
1131.3	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 19

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: N206212.586, E156562.047
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: NC & GBW

BORING LOG

BORING No.: SS1-20
SHEET 1 of 1
DATE: 3-4-2011

WATER LEVELS ▼ 4.8 on 3-5-2011

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1142.2	0.0		CL - LEAN CLAY with Sand; 0-5% fine to coarse gravel; 20-30% fine to coarse sand; medium plasticity; black; very wet; soft. (Fill)		31.2	0.0
1141.8	0.4		CH - FAT CLAY; high plasticity; very dark gray; very wet; stiff. (Alluvium)		30.6	
1140.7	1.5		CL - LEAN CLAY; medium plasticity; very dark grayish brown; very wet; medium stiff. (Alluvium)			2.5
1139.2	3.0		CL - LEAN CLAY; medium plasticity; dark grayish brown; very wet to saturated; very soft. (Alluvium)		31.5	
1137.7	4.5		CL/ML - SILTY CLAY; low to medium plasticity; dark grayish brown; saturated; soft. (Alluvium)		32.4	5.0
1134.7	7.5		CL - LEAN CLAY; medium plasticity; dark grayish brown with grayish brown; saturated; medium stiff; with abundant silt seams. (Alluvium)		32	7.5
1132.2	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 20

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: North Stockpile
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS1-21

SHEET 1 of 1

DATE: 3-14-2011

WATER LEVELS ∇ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
	0.0		CL - LEAN CLAY; 10-15% fine to coarse sand; medium plasticity; black with yellowish brown; wet; medium stiff; with a trace of glass and rubble. (Fill)			0.0
					21.9	
						2.5
	3.0		CL - LEAN CLAY with Sand; 15-25% fine to coarse sand; medium plasticity; grayish brown with light grayish brown; wet to very wet; medium stiff. (Fill)			
					24.2	
						5.0
					23.5	7.5
						10.0
					25.2	
						12.5
	14.0		CL - LEAN CLAY; 5-10% fine to coarse sand; medium plasticity; dark gray with grayish brown; wet; medium stiff to stiff. (Fill)		24.7	
	15.0		CL - LEAN CLAY with Sand; 0-10% fine gravel; 20-30% fine to coarse sand; medium plasticity; dark grayish brown with olive brown; wet; medium stiff; with a trace of brick rubble. (Fill)			15.0
					23.3	17.5
	20.0		Boring Terminated at: 20.0ft			20.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 21

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PROJECT: Flood Storage Area Soil Survey
West Haymarket Project

LOCATION: South Stockpile
Lincoln, NE

JOB NO.: 001100208.00
RIG / METHOD: Bobcat / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS1-22

SHEET 1 of 1

DATE: 3-14-2011

WATER LEVELS ∇ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
	0.0		CL - LEAN CLAY with Sand; 0-10% fine gravel; 15-25% fine to coarse sand; medium plasticity; very dark grayish brown with grayish brown and reddish brown; wet; medium stiff; with a trace of brick and concrete rubble. (Fill)			0.0
					21.3	2.5
	5.0		CL - LEAN CLAY with Sand; same as above but very wet. (Fill)			5.0
					29.9	7.5
						10.0
					26.5	12.5
	14.0		CL - LEAN CLAY; 10-15% fine to coarse sand; medium plasticity; grayish brown with light grayish brown; wet to very wet; medium stiff. (Fill)		22.1	
						15.0
					27.5	17.5
	20.0		Boring Terminated at: 20.0ft			20.0

BORING LOG NORTH SURVEY BORING LOGS.GPJ HWS.GDT 4/1/11

Figure C - 22

APPENDIX D. CRITERIA USED FOR SOIL CLASSIFICATION

USCS SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LESS THAN 5% FINES)		GW	WELL-GRADED GRAVEL
				GP	POORLY-GRADED GRAVEL
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (MORE THAN 12% FINES)		GM	SILTY GRAVEL (LOW PLASTIC FINES)
				GC	CLAYEY GRAVEL (MEDIUM TO HIGH PLASTIC FINES)
MORE THAN 50% OF MATERIALS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LESS THAN 5% FINES)		SW	WELL-GRADED SAND
				SP	POORLY-GRADED SAND
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (MORE THAN 12% FINES)		SM	SILTY SAND (LOW PLASTIC FINES)
				SC	CLAYEY SAND (MEDIUM TO HIGH PLASTIC FINES)
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	SILT (0-15% SAND) SILT WITH SAND (15-30% SAND) SANDY SILT (30-50% SAND)
				CL	LEAN CLAY (0-15% SAND) LEAN CLAY WITH SAND (15-30% SAND) SANDY LEAN CLAY (30-50% SAND)
				OL	ORGANIC SILTS AND LEAN CLAYS
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	ELASTIC SILT (0-15% SAND) ELASTIC SILT WITH SAND (15-30% SAND) SANDY ELASTIC SILT (30-50% SAND)
				CH	FAT CLAY (0-15% SAND) FAT CLAY WITH SAND (15-30% SAND) SANDY FAT CLAY (30-50% SAND)
				OH	ORGANIC ELASTIC SILTS AND FAT CLAYS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

GENERAL NOTES

CRITERIA FOR DESCRIBING CLAY SOILS

MOISTURE CONDITION

Description	Criteria
Dry	Absence of moisture, dusty, dry to touch.
Moist	Damp, slightly wet, moisture content below plastic limit.
Wet	Moisture content above the plastic limit.
Saturated	Very wet. Usually soils is below the water table.

CONSISTENCY

Description	Penetration Resistance, N_{60} (blows/ft)[1]
Very Soft	Less than 3
Soft	3 to 4
Medium Stiff	5 to 8
Stiff	9 to 16
Very Stiff	16 to 32
Hard	Greater than 32

CRITERIA FOR DESCRIBING GRANULAR SOILS

MOISTURE CONDITION

Description	Criteria
Dry	Absence of moisture, dry to the touch.
Moist	Damp but no visible free water.
Wet	Visible free water.
Saturated	Usually soil is below water table.

DENSITY

Description	Penetration Resistance, N_{60} (blows/ft)[1]
Very Loose	Less than 5
Loose	5 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	Greater than 50

CRITERIA FOR DESCRIBING ROCK

STRENGTH/HARDNESS

Description	Criteria
Very Soft	Permits denting by moderate pressure of the fingers.
Soft	Resists denting by the fingers, but can be abraded and pierced to a shallow depth by a pencil point.
Moderately Soft	Resists a pencil point, but can be scratched and cut with a knife blade.
Moderately Hard	Resistant to abrasion or cutting by a knife blade, but can be easily dented or broken by light blows of a hammer.
Hard	Can be deformed or broken by repeated moderate hammer blows.
Very Hard	Can be broken only by heavy, and in some rocks, repeated hammer blows.

[1]Blow counts shown on the boring logs are those recorded directly in the field and have not been corrected for hammer efficiency. The boring log blow counts must be corrected to an equivalent hammer efficiency of 60% in order to use the criteria in this table.

APPENDIX E. MOISTURE-DENSITY CURVES

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Soil Compaction Curve
STANDARD COMPACTIVE EFFORT
ASTM Designation: D 698

Job No.: 00110208.00 Lab No. 29479 Curve No. 5885 Date 10-Mar-11

Project: Flood Storage Area Soil Survey

Location: Onsite Composite Alluvium

Material: Dark Grayish Brown Lean Clay

Classification	CL	Total Percent Retained On:	
Liquid Limit	35	No. 4 Sieve	
Plastic Limit	22	3/8-in. Sieve	
Plasticity Index	13	3/4-in. Sieve	
Specific Gravity		Oversize Fraction	%

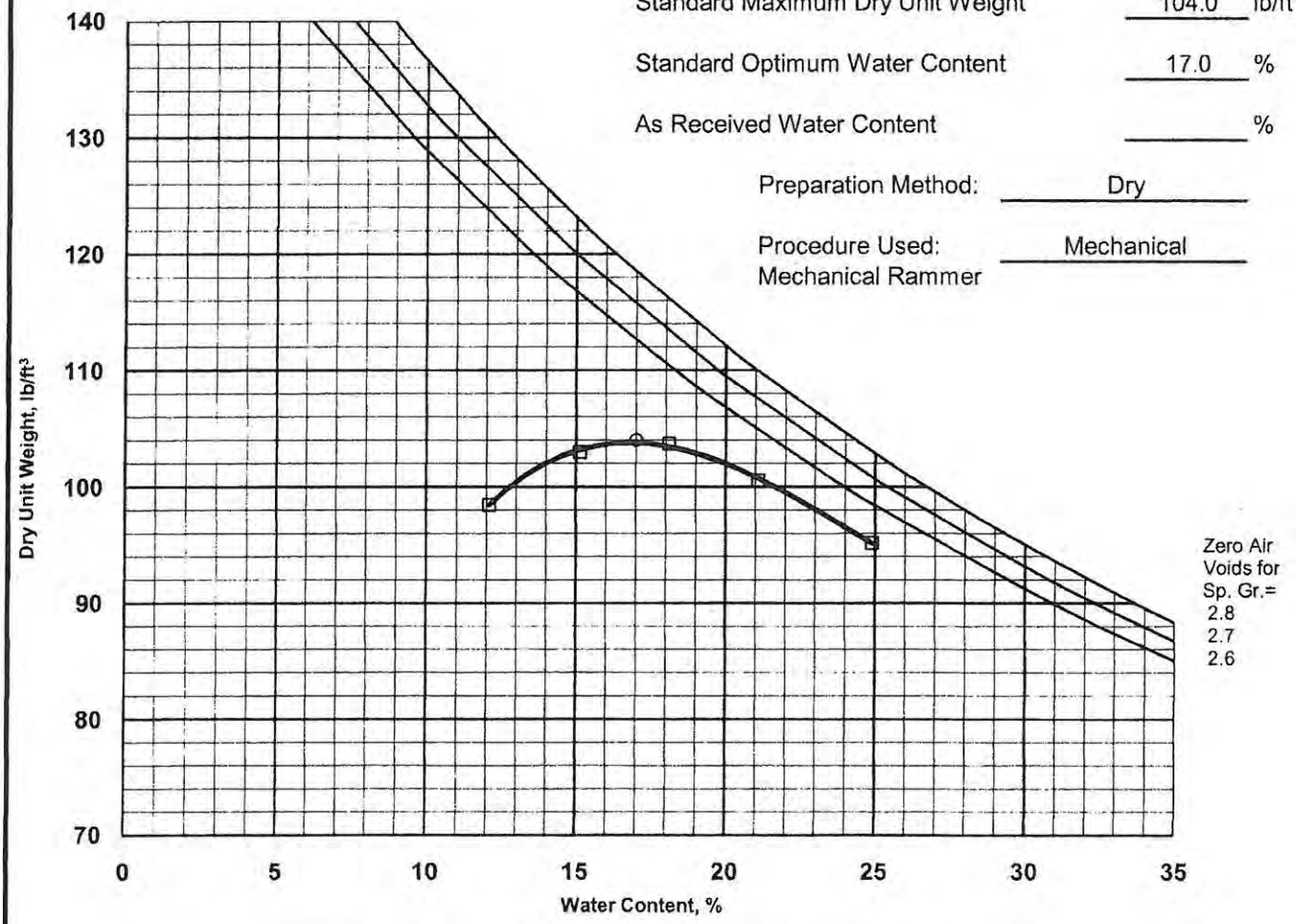
Standard Maximum Dry Unit Weight 104.0 lb/ft^3

Standard Optimum Water Content 17.0 %

As Received Water Content %

Preparation Method: Dry

Procedure Used: Mechanical
Mechanical Rammer



□ Laboratory test points ○ Computed Max. Dry Unit Weight and Optimum water content

Figure E-1

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Soil Compaction Curve
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ASTM Designation: D 698

Job No.: 00110208.00 Lab No. 29480 Curve No. 5886 Date 10-Mar-11

Project: Flood Storage Area Soil Survey

Location: SSI-5 (0.0' - 5.0') and SSI-15 (5.0' - 8.0')

Material: Dark Brown Lean Clay

Classification	CL	Total Percent Retained On:	
Liquid Limit	40	No. 4 Sieve	
Plastic Limit	19	3/8-in. Sieve	
Plasticity Index	21	3/4-in. Sieve	
Specific Gravity		Oversize Fraction	%

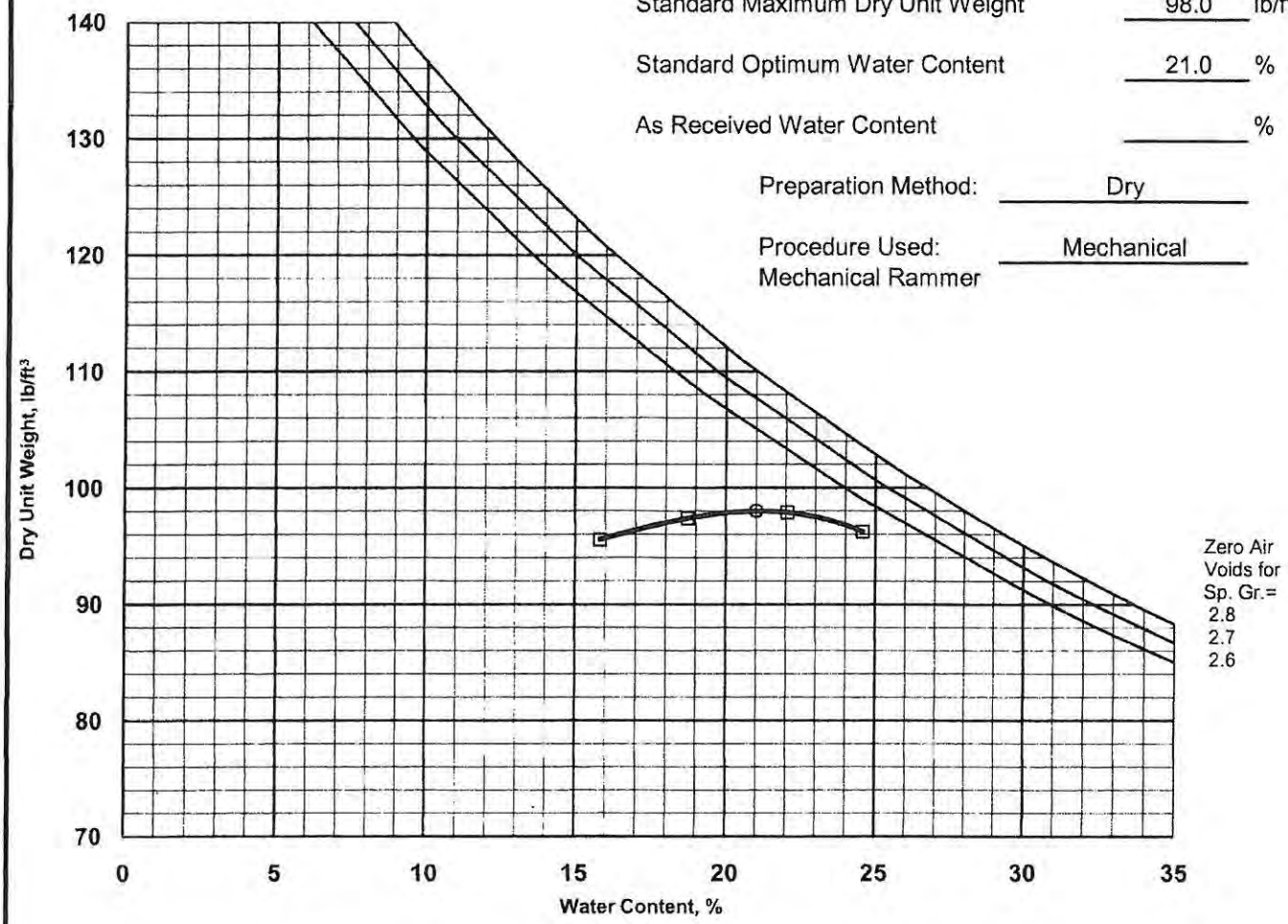
Standard Maximum Dry Unit Weight 98.0 lb/ft^3

Standard Optimum Water Content 21.0 %

As Received Water Content %

Preparation Method: Dry

Procedure Used: Mechanical
Mechanical Rammer



□ Laboratory test points ○ Computed Max. Dry Unit Weight and Optimum water content

Figure E-2

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Soil Compaction Curve
STANDARD COMPACTIVE EFFORT
ASTM Designation: D 698

Job No.: 00110208.00 Lab No. 29481 Curve No. 5887 Date 10-Mar-11

Project: Flood Storage Area Soil Survey

Location: B-9 (2.0' - 6.0')

Material: Brown Alluvium - Lean Clay

Classification	CL	Total Percent Retained On:	
Liquid Limit	47	No. 4 Sieve	
Plastic Limit	19	3/8-in. Sieve	
Plasticity Index	28	3/4-in. Sieve	
Specific Gravity		Oversize Fraction	%

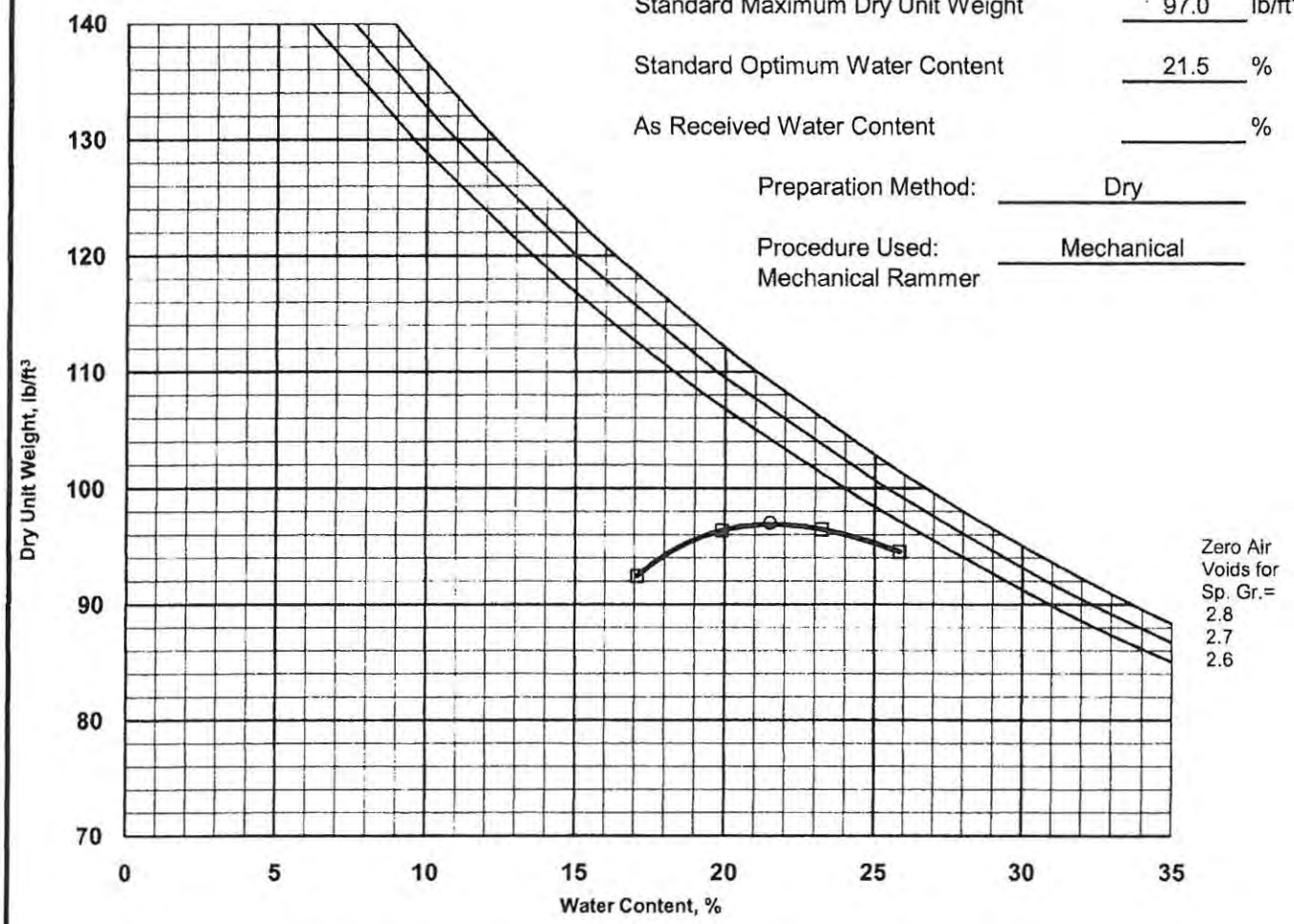
Standard Maximum Dry Unit Weight 97.0 lb/ft³

Standard Optimum Water Content 21.5 %

As Received Water Content %

Preparation Method: Dry

Procedure Used: Mechanical
Mechanical Rammer



□ Laboratory test points ○ Computed Max. Dry Unit Weight and Optimum water content

Figure E-3

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Soil Compaction Curve
STANDARD COMPACTIVE EFFORT
ASTM Designation: D 698

Job No.: 00110208.00 Lab No. 29482 Curve No. 5888 Date 10-Mar-11

Project: Flood Storage Area Soil Survey

Location: B-11 (0.0' - 3.5')

Material: Brown Fill - Sandy Lean Clay with Cinders

Classification	CL	Total Percent Retained On:	
Liquid Limit	45	No. 4 Sieve	
Plastic Limit	25	3/8-in. Sieve	
Plasticity Index	20	3/4-in. Sieve	
Specific Gravity		Oversize Fraction	%

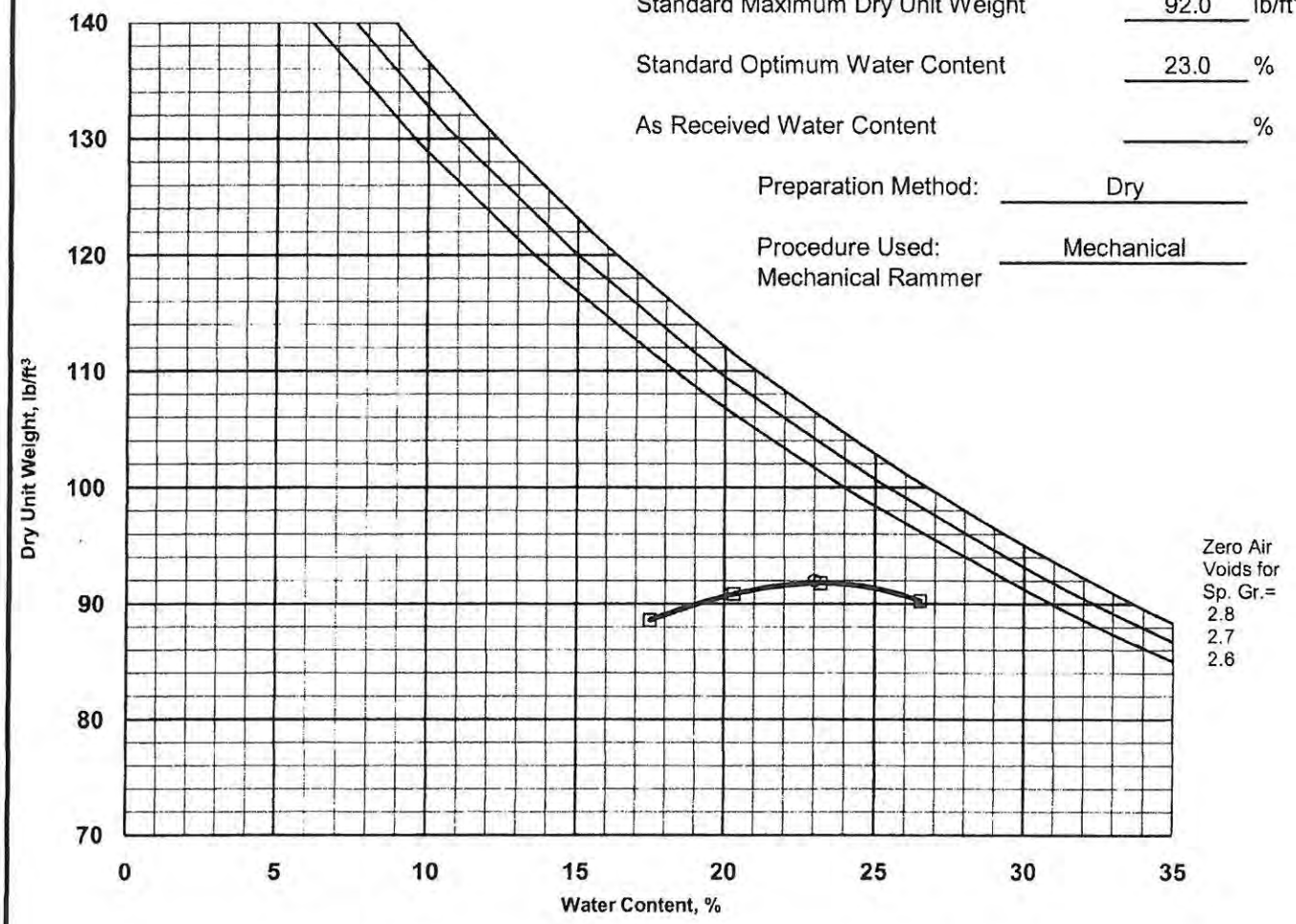
Standard Maximum Dry Unit Weight 92.0 lb/ft^3

Standard Optimum Water Content 23.0 %

As Received Water Content %

Preparation Method: Dry

Procedure Used: Mechanical
Mechanical Rammer



□ Laboratory test points ○ Computed Max. Dry Unit Weight and Optimum water content

Figure E-4

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Soil Compaction Curve
STANDARD COMPACTIVE EFFORT
ASTM Designation: D 698

Job No.: 00110208.00 Lab No. 29483 Curve No. 5890 Date 19-Mar-11

Project: Flood Storage Area Soil Survey

Location: SS1-21; North Stockpile

Material: Very Dark Brown - Sandy Lean Clay

Classification	CL	Total Percent Retained On:	
Liquid Limit	38	No. 4 Sieve	
Plastic Limit	22	3/8-in. Sieve	
Plasticity Index	16	3/4-in. Sieve	
Specific Gravity		Oversize Fraction	%

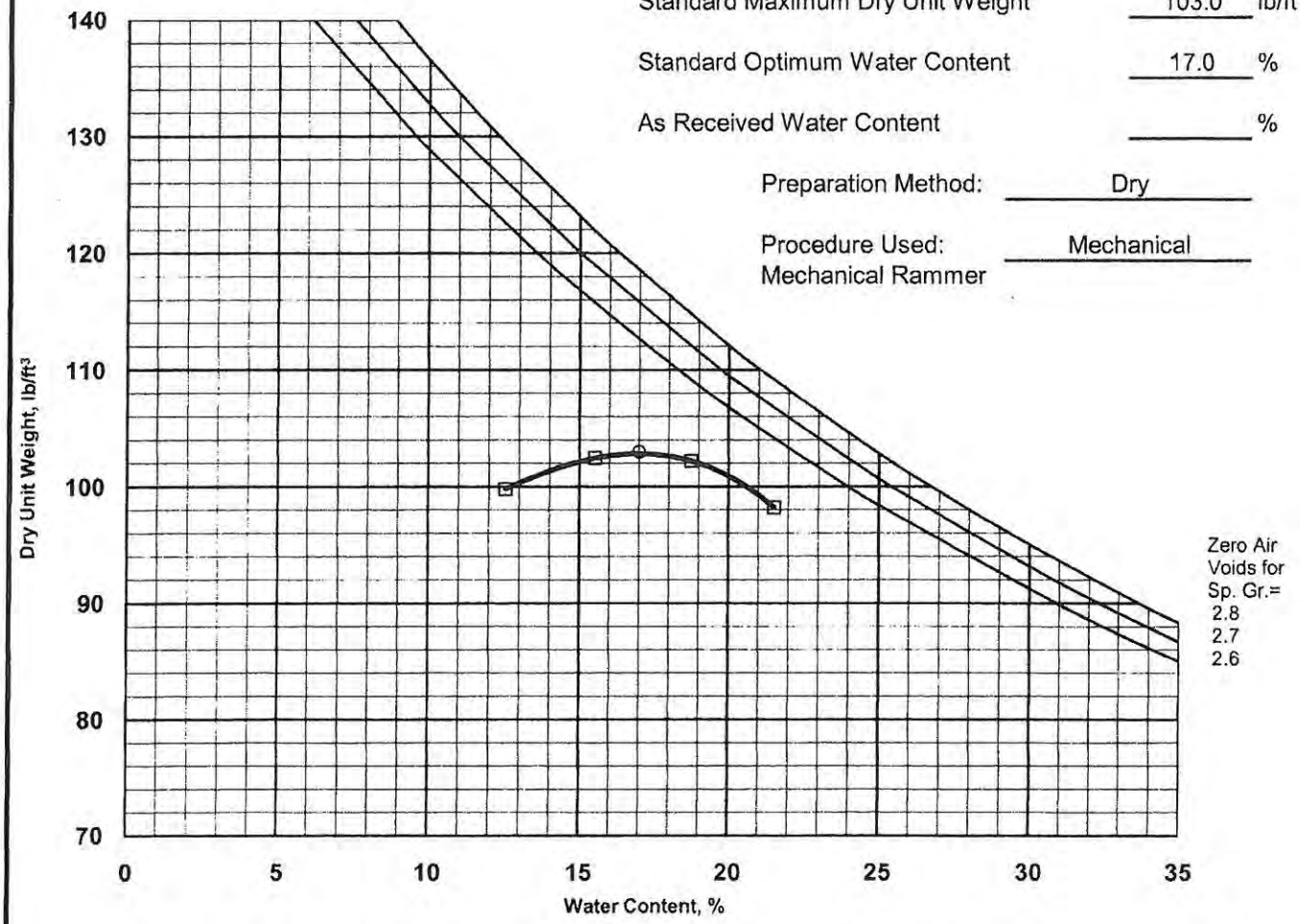
Standard Maximum Dry Unit Weight 103.0 lb/ft^3

Standard Optimum Water Content 17.0 %

As Received Water Content %

Preparation Method: Dry

Procedure Used: Mechanical
Mechanical Rammer



□ Laboratory test points ○ Computed Max. Dry Unit Weight and Optimum water content

Figure E-5

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Soil Compaction Curve
STANDARD COMPACTIVE EFFORT
ASTM Designation: D 698

Job No.: 110208 Lab No. 29550 Curve No. 5892 Date 19-Mar-11

Project: Flood Storage Area Soil Survey

Location: SS1-22; South Stockpile

Material: Dark Brown Fill - Lean Clay with Sand

Classification	CL	Total Percent Retained On:	
Liquid Limit	43	No. 4 Sieve	
Plastic Limit	21	3/8-in. Sieve	
Plasticity Index	22	3/4-in. Sieve	
Specific Gravity		Oversize Fraction	%

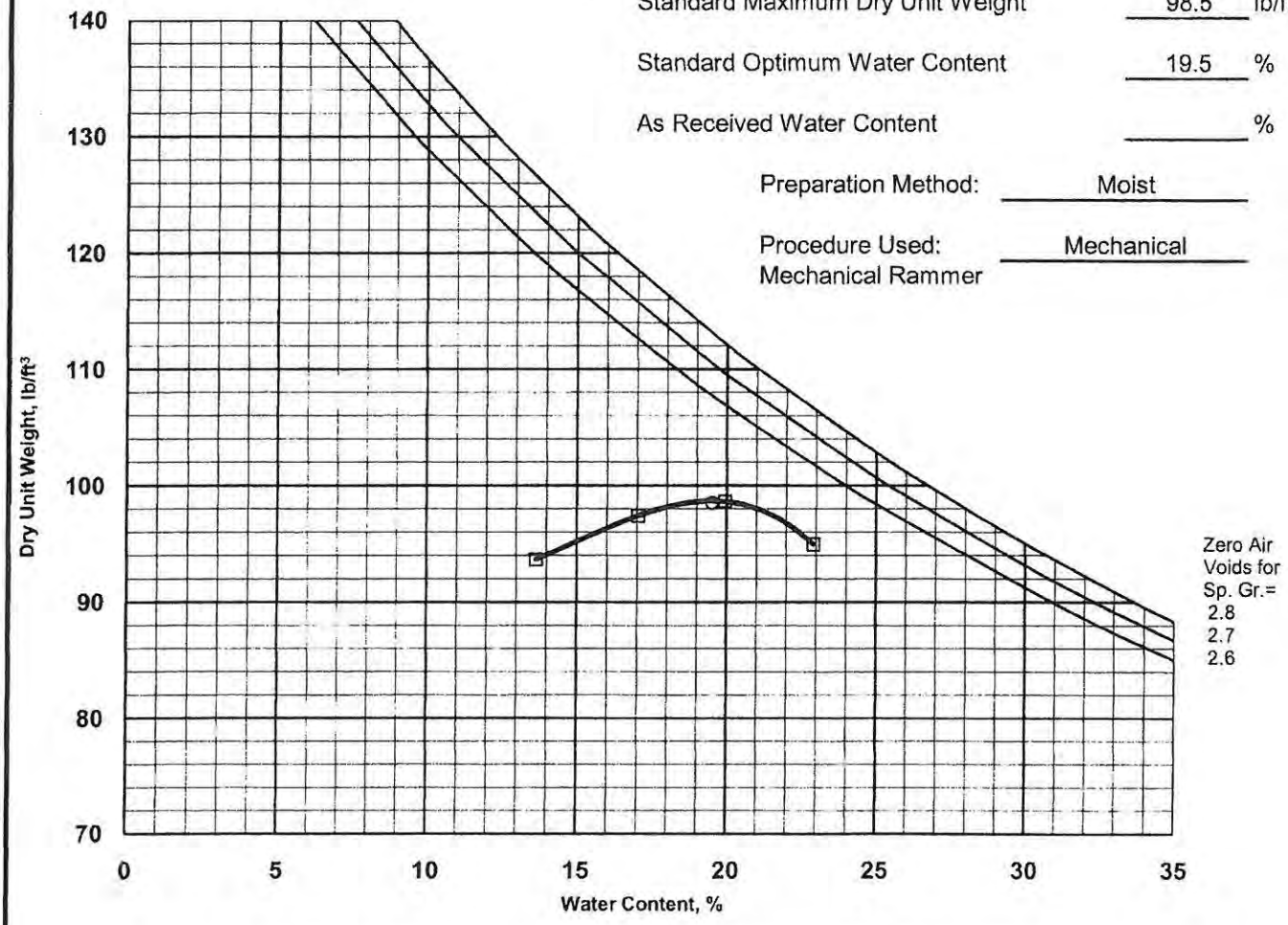
Standard Maximum Dry Unit Weight 98.5 lb/ft^3

Standard Optimum Water Content 19.5 %

As Received Water Content %

Preparation Method: Moist

Procedure Used: Mechanical
Mechanical Rammer



□ Laboratory test points ○ Computed Max. Dry Unit Weight and Optimum water content

Figure E-6

ADDENDUM NO. 2

WEST HAYMARKET JOINT PUBLIC AGENCY
HAYMARKET INFRASTRUCTURE IMPROVEMENT
INTITIAL HAYMARKET SITE PREPARATION
PROJECT NO. 870703
BID NO. 11-079

Addenda are instruments issued by the Purchasing Office prior to the date or time for receipt of offers which will modify or interpret the specifications document by addition, deletion, clarification or correction.

Please acknowledge receipt of this addendum in the space provided in the Attribute Section.

Please be advised of the following changes and clarifications to the City's specification and bidding documents:

1. Refer to the Special Provisions, page 68, "Additional Specifications Sections".

   Revise this section to incorporate into the Contract Documents the Geotechnical Report for the Project Area to the South of "R" Street, the Grading & Control Plan Sheets for the North 48th Street Solid Waste Facility and the SWPPP for the North 48th Street Solid Waste Facility, which are attached to this addendum. It should be noted that the SWPPP for the North 48th Street Solid Waste Facility references City of Lincoln Project No. 701482 which is the project number used by the City of Lincoln's Solid Waste Operations for their project costs and other necessary project items that need to be tracked independently of the work associated with JPA Project No. 870703 for the Initial Haymarket Site Preparation.

Dated this 8th day of April, 2011.

This document was originally issued and sealed by Thomas A. Leikam, E-6290, on 4-8-11. This media should not be considered a certified document.

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April 7, 2011

Mr. Daniel K. Marvin
Joint Public Authority
555 South 10th Street
Lincoln, NE 68508

REFERENCE: Geotechnical Engineering Report
South "Hole-in-the-Donut" Soil Survey
West Haymarket Project
Lincoln, Nebraska

Dear Mr. Marvin:

This report summarizes the findings of the subsurface exploration, laboratory tests and a geotechnical analysis to assess the nature and characteristics of the subsurface materials in the "hole-in-the-donut" area, located in the BNSF's Lincoln Depot X-yard. Specifically, this area is bounded by the existing Amtrak tracks to the east, the X-yard storage tracks to the west, the proposed arena site to the north, and the "O" Street Harris overpass to the south.

As part of the West Haymarket project grading operations, much of the existing fill within the referenced area might need to be removed and replaced prior to construction of buildings and pavement. The clayey and sandy "fill" soils encountered at the boring locations <u>might</u> be found to be suitable for support of floor slabs and pavement, however, due to their variable degree of compaction, should not be assumed suitable for the support of even lightly loaded spread footings. Due to the variability of the existing fill materials and the inability to know at this time if future structures will have some interior lightly loaded spread footings, Benesch is recommending that all existing fill materials be removed prior to the commencement of backfilling and filling operations performed within the proposed building and pavement areas. This report suggests that consideration be given to reusing the relatively clean clayey and sandy fill materials that are excavated, for the construction of the compacted fill and backfill required as part of the site grading operations.

The geotechnical testing and evaluation performed to prepare this report assessed the suitability of those existing fill materials encountered in the referenced area for reuse as fill within the West Haymarket Arena and surrounding building structures and paved areas. Additionally, the moisture content and compaction characteristics were determined for the most prevalent suitable fill materials encountered. The data obtained from the testing was utilized to determine if the excavated soils will require moisture manipulation (in particular drying) prior to placement and compaction, in order to obtain the degree of compaction specified for the project.

The minimum degree of compaction assumed for fill and backfill constructed for the proposed arena, and for all other building pads and paved areas located within the referenced area, was 98% of the "Maximum Dry Density" as determined by ASTM D 698, Procedure A, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf./ft^3) (600 kN-m/m^3). Reference should be made to Benesch's December 29th, 2010 geotechnical engineering report, *"Proposed Arena and Parking Garage; West Haymarket Project; Lincoln, NE"*, which recommends these compaction requirements and moisture recommendations for backfill and fill placed within building areas and areas to be paved.

SUBSURFACE EXPLORATION

A program of Dutch friction-cone soundings, test borings and soil sampling was performed at the project site from March 15 to March 18, 2011. Thirty-five (35) Dutch friction-cone soundings and thirty-five (35) exploratory borings were taken to a depth of 10.0 feet below the existing grade to establish the general subsurface conditions within the hole-in-the-doughnut area. Reference should be made to the boring location plan which shows the locations of the borings performed within the referenced area.

The Dutch friction-cone soundings were performed with a mechanical penetrometer in accordance with ASTM D 3441, Standard Method for Deep, Quasi-Static, Cone, and Friction Cone Penetration Tests of Soil. The plot of the data from this test identifies the relative positions and thicknesses of hard and soft layers of soil.

The borings were made in accordance with ASTM D 1452, Standard Practice for Soil Investigation and Sampling by Auger Borings. A machine-driven, continuous-flight auger having a diameter of 6 inches was used to advance the holes for soil sampling and logging. The borings were performed using a CME-75 truck-mounted drill rig.

The vicinity map and the boring location plan are presented in Appendix A. The penetration diagrams (see Appendix B) present the results of the Dutch friction-cone soundings. The boring logs (see Appendix C) present the data obtained in the subsurface exploration. The logs include the surface elevations, the approximate depths and elevations of major changes in the character of the subsurface materials, visual descriptions of the materials in accordance with the criteria presented in Appendix D, and groundwater data.

The locations and elevations (NAVD88) of the soundings and borings were determined by GPS by Benesch's survey crew. Water level readings were made in the auger borings at times and under conditions stated on the boring logs.

LABORATORY ANALYSES

The disturbed soil samples obtained during the subsurface exploration were examined in the laboratory by a member of Benesch's professional engineering staff to supplement the field identification. Standard tests were performed on selected samples to determine the engineering properties of the subsurface materials.

The moisture contents were determined in accordance with ASTM D 2216, Standard Test Method for Determination of Water (Moisture) Content of Soil and Rock by Mass. These test results are presented in the boring logs opposite the respective sample locations.

The plasticity characteristics of air-dried samples of subsurface and stockpile soils were determined in accordance with ASTM Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils (ASTM D 4318). The test results are presented in Table 1.

TABLE 1
ATTERBERG LIMITS

Lab No.	Source/ Soil Type	Liquid Limit, %	Plastic Limit, %	Plasticity Index	Group Symbol
29628	Composite / Alluvium	54	19	35	CH-Fat Clay
29629	Composite / Fill	52	19	33	CH-Fat Clay
29631	Composite / Alluvium	47	18	29	CL-Lean Clay

Determinations of the distribution of particle sizes in samples of the subsurface soils were made in accordance with AASHTO Designation T 88, Standard Method of Particle Size Analysis of Soils. The composition of each of these samples is presented in Table 2.

TABLE 2
PARTICLE-SIZE DATA

Lab No.	Source/ Soil Type	Percent Gravel (Greater than 4.76 mm)	Percent Sand (0.074-4.76 mm)	Percent Silt (0.002-0.074 mm)	Percent Clay (Less than 0.002 mm)
29628	Composite / Alluvium	0	4	62	34
29629	Composite / Fill	0	7	57	36
29631	Composite / Alluvium	1	8	62	29

The moisture-density relations of representative samples of the subsurface soils were determined in accordance with ASTM D 698, Procedure A, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf./ft^3) (600 kN-m/m^3). A summary of the test results are presented in Table 3, and the complete test reports are presented in Appendix E.

TABLE 3
MOISTURE-DENSITY RELATIONS TEST DATA

Lab No.	Source/ Soil Type	Group Symbol	Sand Content %	Maximum Dry Unit Weight, lbf/ft^3	Optimum Moisture Content, %
29628	Composite / Alluvium	CH-Fat Clay	4	93.5	24.0
29629	Composite / Fill	CH-Fat Clay	7	97.5	22.5
29631	Composite / Alluvium	CL-Lean Clay	9	97.5	20.5

GEOLOGY AND SITE CONDITIONS

The City of Lincoln lies in the Dissected Till Plains section of Nebraska, a part of the Central Lowland province of the Interior Plains physiographic division[1]. The project site is located in west-central Lincoln, Nebraska, on alluvial bottomlands adjacent to Salt Creek. The bottomlands are a flood plain setting consisting of relatively deep deposits of alluvium. The site is currently a railroad yard with a history of being graded to raise the area to its current elevation.

The subsurface materials encountered at the boring locations generally consisted of existing fill overlying mostly cohesive alluvial soils to the 10-foot-depth of the borings. Some of the existing fill is comprised of rubble and/or cinders that are not considered suitable for reuse as controlled (compacted) earth fill. Controlled earth fill is defined as being earth fill that is designed, compacted and tested in accordance with generally accepted good practice and placed with observation by the Geotechnical Engineer. Fill materials were encountered at some of the boring locations up to depths as great as 10.0 feet below existing grade. The fill materials are not uniformly well compacted and, therefore, are considered unsuitable to remain within the building areas for the reasons previously discussed. The depths that fill materials (both those unsuitable and suitable for reuse as fill and backfill) extend below existing grade, at each boring location, are shown in Table 4 below. Detailed descriptions of the materials encountered at each boring location are provided in the boring logs, which are presented in Appendix C.

Groundwater was not encountered to the depth of the borings, with the exception of boring SS2-12. The groundwater level in boring SS2-12 was recorded at a depth of 8.0 feet below existing grade. The water table could be expected to fluctuate several feet depending on surface drainage, rainfall, vegetation, temperature and other factors.

A petroleum-like odor was detected in several of the subsurface materials. Consultation with an environmental specialist should be considered to evaluate any compliance and/or property development issues related to this petroleum-like odor.

TABLE 4
DEPTH AND ELEVATION OF "BOTTOM" OF SUITABLE AND UNSUITABLE FILL MATERIALS

Boring No.	Unsuitable Fill Depth, ft[1]	Unsuitable Fill Elev., ft	Suitable Fill Depth, ft	Suitable Fill Elev., ft
SS2-1	-	-	5.0	1142.9
SS2-2	-	-	3.5	1145.7
SS2-3	-	-	2.5	1148.2
SS2-5	-	-	6.0	1143.6
SS2-6	-	-	3.0	1148.1
SS2-8	-	-	7.0	1143.3
SS2-9	2.0	1149.1	7.0	1144.1
SS2-10	-	-	3.0	1145.5
SS2-11	-	-	3.0	1145.7
SS2-12	3.0	1147.6	5.0	1145.6
SS2-13	1.0	1149.9	7.0	1143.9
SS2-14	-		4.0	1144.5
SS2-15	-	-	5.0	1144.0
SS2-16	5.5	1145.1	-	-
SS2-17	2.0	1149.7	4.0	1147.7
SS2-18	-	-	5.0	1143.7
SS2-19	-	-	6.0	1143.5
SS2-20	4.5	1145.7	7.0	1143.2
SS2-21	1.0	1151.9	5.0	1147.2
SS2-22	-	-	5.0	1144.0
SS2-23	-	-	7.0	1142.9
SS2-24	5.5	1145.1	10.0	1140.6
SS2-25	3.5	1148.0	8.5	1143.0
SS2-26	-	-	3.5	1145.4
SS2-27	-	-	5.0	1144.9
SS2-28	6.5	1144.1	8.5	1142.1
SS2-29	3.0	1148.4	6.5	1144.9
SS2-30	-	-	5.0	1144.1
SS2-31	-	-	5.0	1144.9
SS2-32	6.0	1144.9	7.0	1143.9
SS2-33	2.0	1149.5	6.0	1145.5
SS2-34	-	-	7.0	1143.1
SS2-35	-	-	6.0	1144.1
SS2-36	2.0	1148.8	6.0	1144.8
SS2-37	2.0	1149.3	6.5	1144.8

[1]Unsuitable fill materials consist of rubble, cinders, organics, topsoil, and railroad ties.

DISCUSSION AND RECOMMENDATIONS

As Table 4 shows, fill materials were encountered to some depth at all thirty-seven boring locations. Some of the existing fill contains rubble, cinders, ballast and railroad ties. The rubble, cinders, railroad ties, and ballast materials are, in themselves, not considered suitable for reuse as controlled (compacted) earth fill. However, the cinders and ballast materials may be re-used within the fill if they are uniformly blended with cohesive soil such that the blended material contains no more than 25% cinders and ballast. A review of the boring logs indicates that layers of cinders ranging from 1.0 feet to 6.5 feet thick were encountered at 15 of the 37 boring locations. With the exception of any organic materials (none of which were encountered at the boring locations), railroad ties, topsoil, concrete and brick rubble larger than 6 inches in diameter, and cinders containing less than 75% soil admixture; all remaining soils that will be excavated are considered suitable for reuse as controlled earth fill and backfill when performing the grading operations on the Arena and other building and pavement areas between the Arena and the "O" Street overpass as shown in Table 4.

The upper 1 to 5 feet of existing fill materials encountered at boring locations SS2-02, -03, -05, -06, -07, -08, -10, -11, -19, -22, -23, -27, and -35 consist of granular materials that include fine sands, silty fine sands, and some silty gravels. These granular materials are all considered suitable for reuse when constructing compacted backfill and fill within the building and pavement areas but might require a different type of compaction equipment to achieve the specified degree of compaction.

Based on the results of the laboratory testing, approximately half of the suitable existing fill materials will require drying to achieve the degree of compaction specified (density equal to or greater than 98% of the Maximum Dry Density per ASTM D 698) for controlled earth fill and backfill constructed within the proposed building and pavement areas. Comparison of the moisture contents versus proctor moisture-density results would indicate that those soils logged as being wet to very wet would require an average reduction in moisture content of 4 to 5 percent to achieve the degree of compaction specified for backfill and fill, and over a 10 percent reduction for some of the wet to very wet soils.

Procedures for Drying Soil

Procedures often utilized to dry wet soils in order to meet the specified degree of compaction include the following:

A. Disc Harrow – Consists of working a lift of soil whose loose lift thickness does not exceed the depth that a disc harrow can fully penetrate. The disc should be used to repeatedly work the soil to aerate and reduce its moisture content to the degree required to achieve the specified degree of compaction.
B. Fly Ash Admixture – Consists of applying and uniformly blending fly ash into the wet soil. The anticipated quantity of fly ash that would need to be added to the wet soil is 10% to 15% by total dry weight of soil.
C. Lime Admixture – Consists of applying and uniformly blending lime into the wet soil. The anticipated quantity of lime that would need to be added to the wet soil is 3% to 4% by total dry weight of soil.

The fly ash or lime should be applied and blended into the soils in a uniform manner. The mixture should cure until the moisture content has reduced sufficiently to allow proper compaction and the preparation of a stable

subgrade. Approximately four to ten hours curing time might be necessary to adequately cure either a fly ash/soil or lime/soil mixture. After curing, the mixture should be compacted to the required density.

It is Benesch's understanding that the quantity of soils that are being excavated and considered suitable for reuse as compacted backfill and fill on the proposed grading project will comprise less than one-half the soils required as backfill and fill for the structures and pavement areas being developed on the West Haymarket Arena and adjacent sites. Additional fill obtained from off-site borrow pits will be required to complete the required grading operations. Benesch recommends that those excavated materials that are considered suitable for reuse as compacted fill and backfill be utilized to construct the lower portion (i.e., greater than 3 to 4 feet below finished floor or pavement subgrade level) of the compacted backfill and fill constructed on the West Haymarket Arena, adjacent building pads and pavement areas.

CONCLUSIONS

Benesch concludes, on the basis of the findings of the subsurface exploration at the project site and the evaluation of the engineering properties of samples of the subsurface soils, that approximately 50% of the existing fill materials are suitable for re-use during the construction of compacted backfill or fill within the Arena and other building and pavement areas to the south of the Arena (up to the "O" Street overpass). Concrete, brick and other rubble greater than 6 inches in diameter, railroad ties, organic soils, and cinders containing less than 75% soil admixture are not recommended for reuse as fill and backfill.

Approximately half of the soils that are considered suitable for reuse as fill and backfill are presently in a wet to very wet state. These soils will require drying to achieve the degree of compaction specified (density equal to or greater than 98% of the Maximum Dry Density per ASTM D 698) for fill and backfill materials constructed within the proposed building and pavement areas. Recommendations have been provide for drying out these soils.

The opinions and recommendations presented in this report are based in part upon Benesch's analyses of the data from the soil borings and laboratory tests performed for the project. The boring logs and related information depict subsurface conditions only at the specific boring locations and at the time of the subsurface exploration. Soil conditions may differ between the exploratory borings and will change with time from when those soils that are considered suitable for re-use as compacted fill are excavated and transported to the building and pavement areas that are being graded. The nature and extent of variations in soil conditions between the borings might not be evident until grading operations have begun. Contractors should perform their own personal assessment of the reusability (as backfill and fill) of the suitable existing fill materials, taking into consideration the time frame and construction season when the grading operations will be performed for the West Haymarket Arena and adjacent structures and paved areas.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices for exclusive use by City of Lincoln for specific application to the proposed West Haymarket project. The recommendations of this report are not valid for any other purpose. Benesch should be contacted if any questions arise concerning this report. This report shall not be reproduced, except in full, without the written approval of Alfred Benesch & Company.

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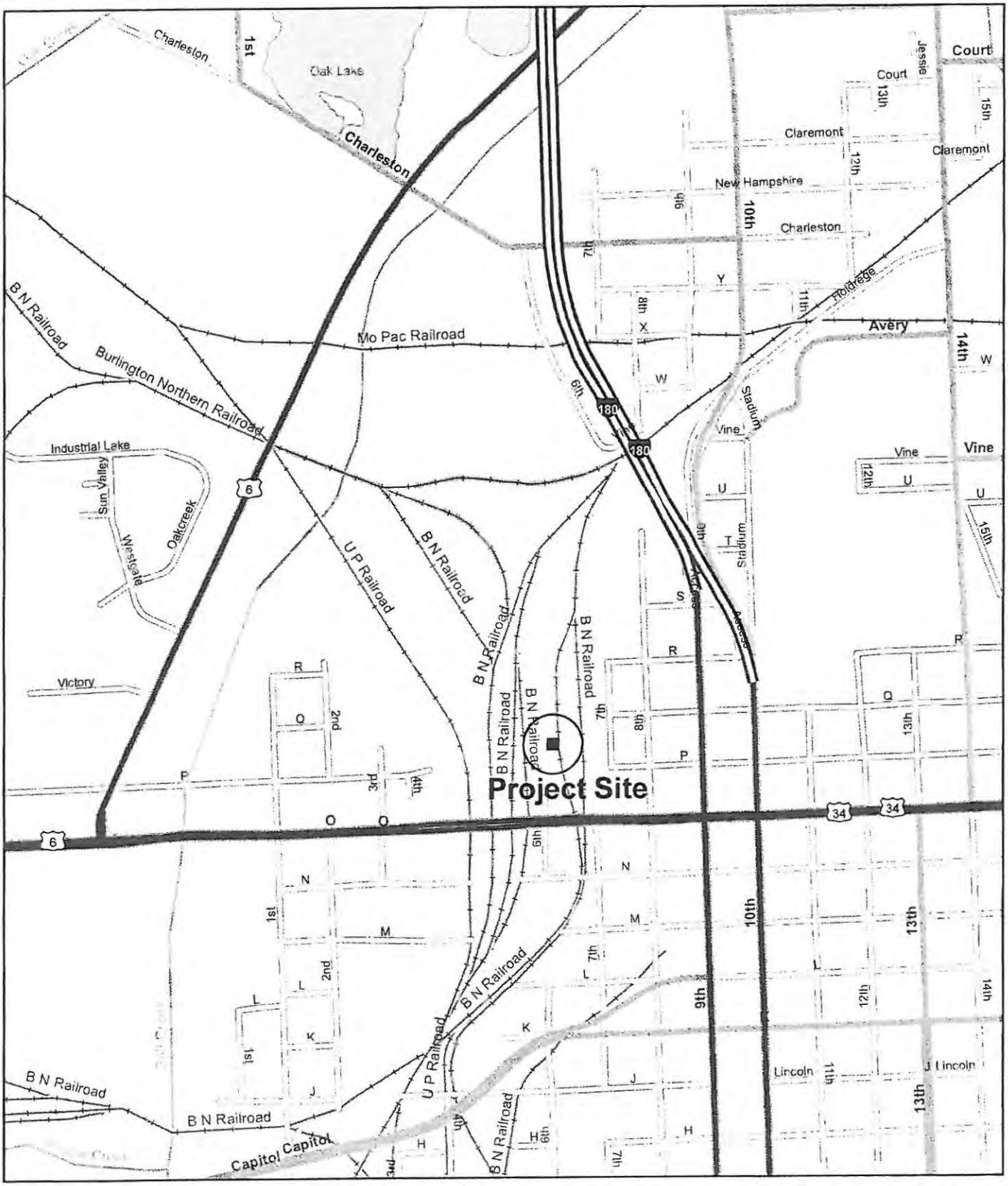
Reviewed By:

Gary E. Proskovec, P.E.

V-2015SouthSoilSurveyReport.docx
00110208.00-00001
Orig.: City of Lincoln
2 cc.: Olsson Associates

APPENDIX A. VICINITY MAP AND BORING LOCATION PLAN



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N
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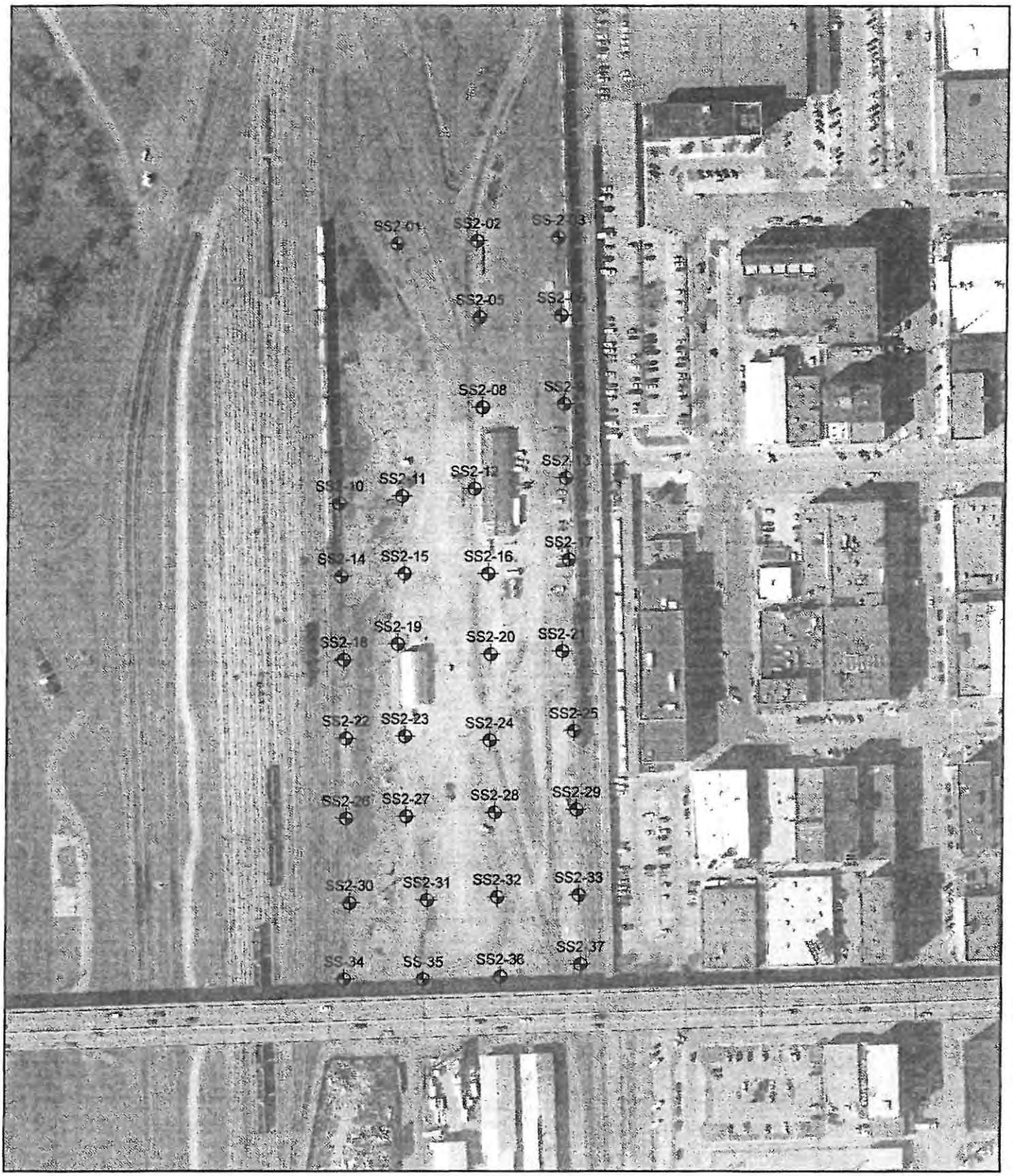
1,000 500 0 1,000
Feet

South Haymarket Soil Survey
West Haymarket Project
Lincoln, Nebraska

Vicinity Map
Figure A-1



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N
W E
S

200 100 0 200
Feet

South Haymarket Soil Survey
West Haymarket Project
Lincoln, Nebraska

Boring Location Plan
Figure A-2

APPENDIX B. DUTCH FRICTION-CONE PENETRATION DIAGRAMS

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-01**
Location: **SS2-01**
Surface Elevation: **1147.9 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

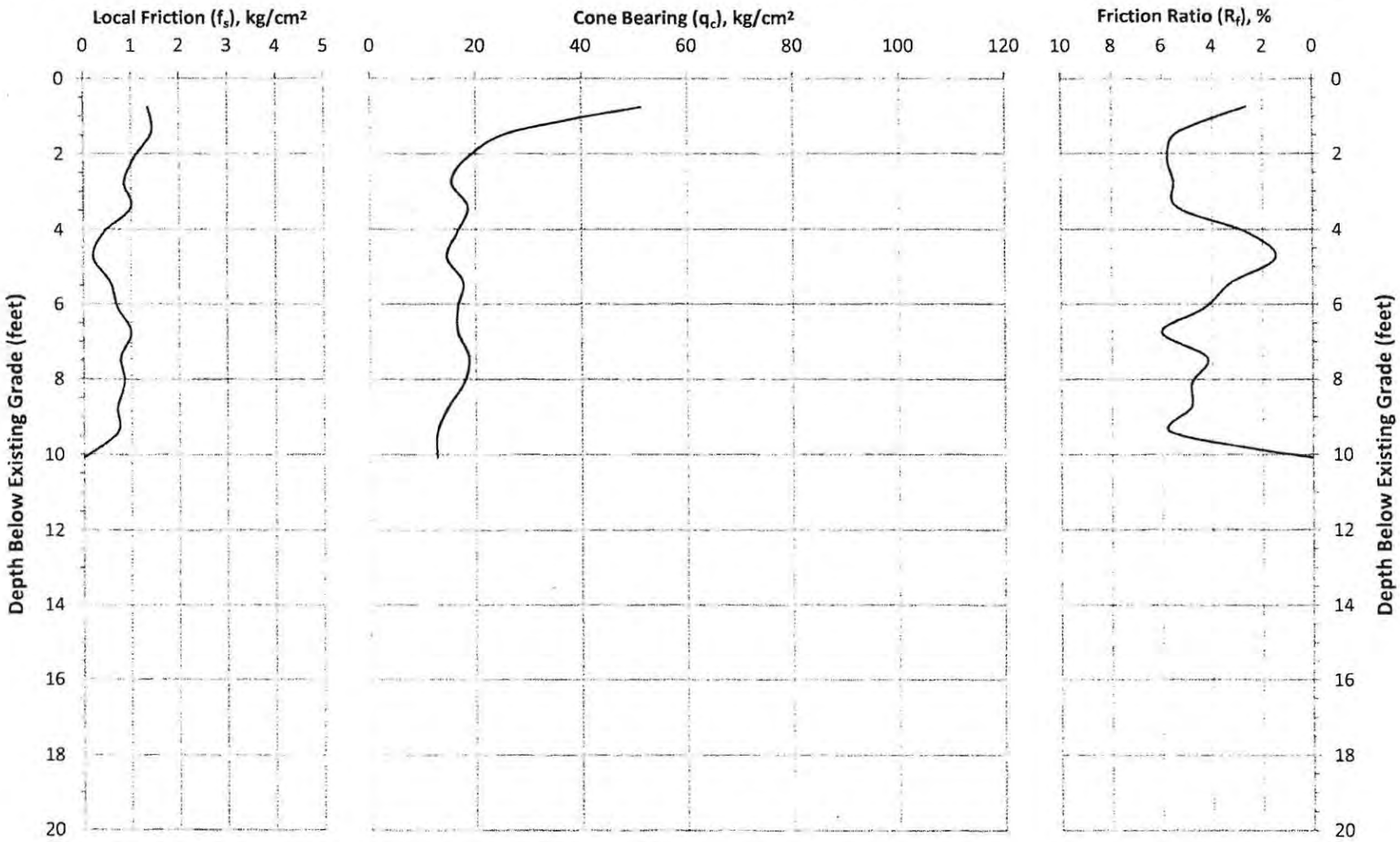

Figure B-01a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-02**
Location: **SS2-02**
Surface Elevation: **1149.2 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

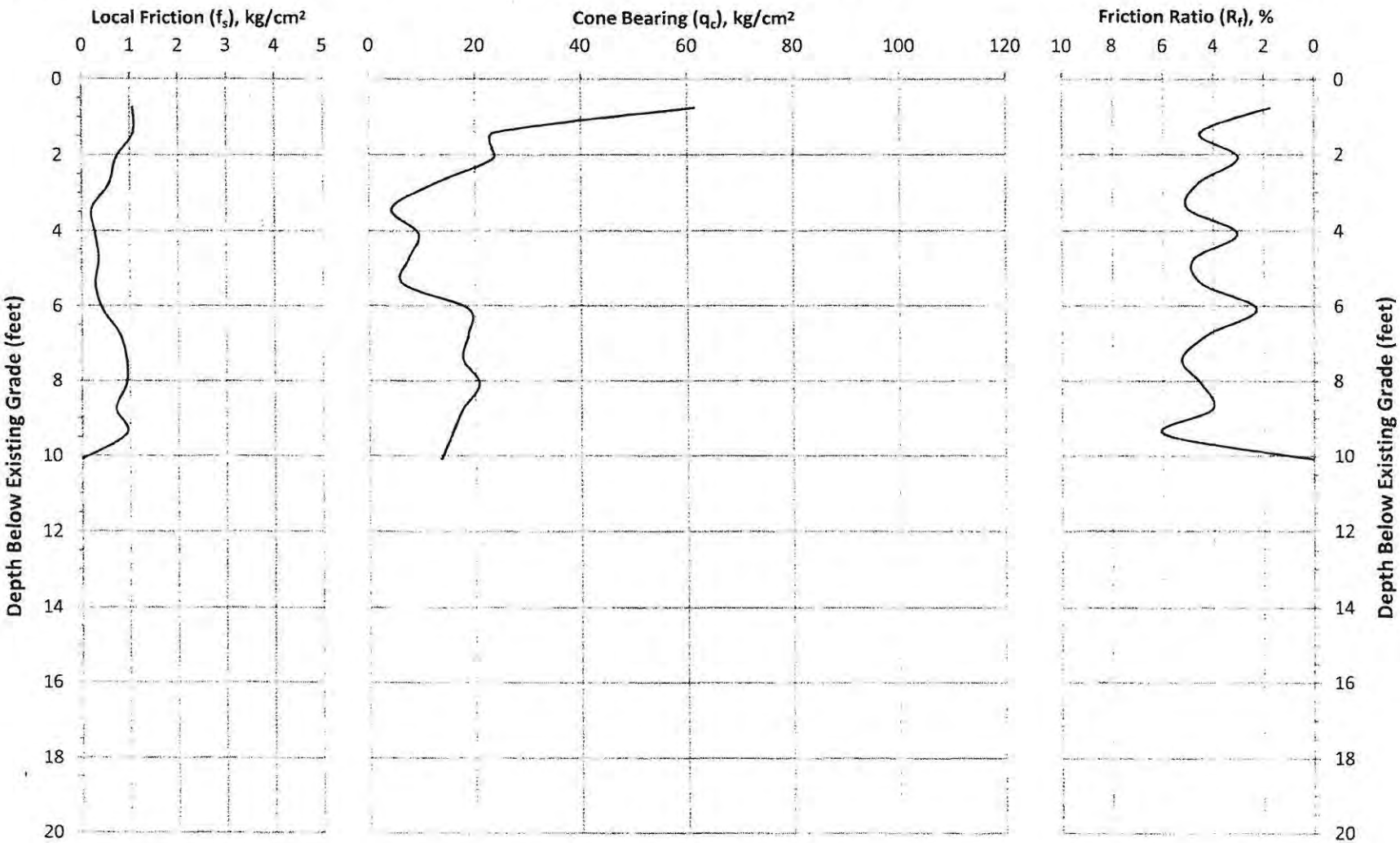

Figure B-02a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-03**
Location: **SS2-03**
Surface Elevation: **1150.7 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

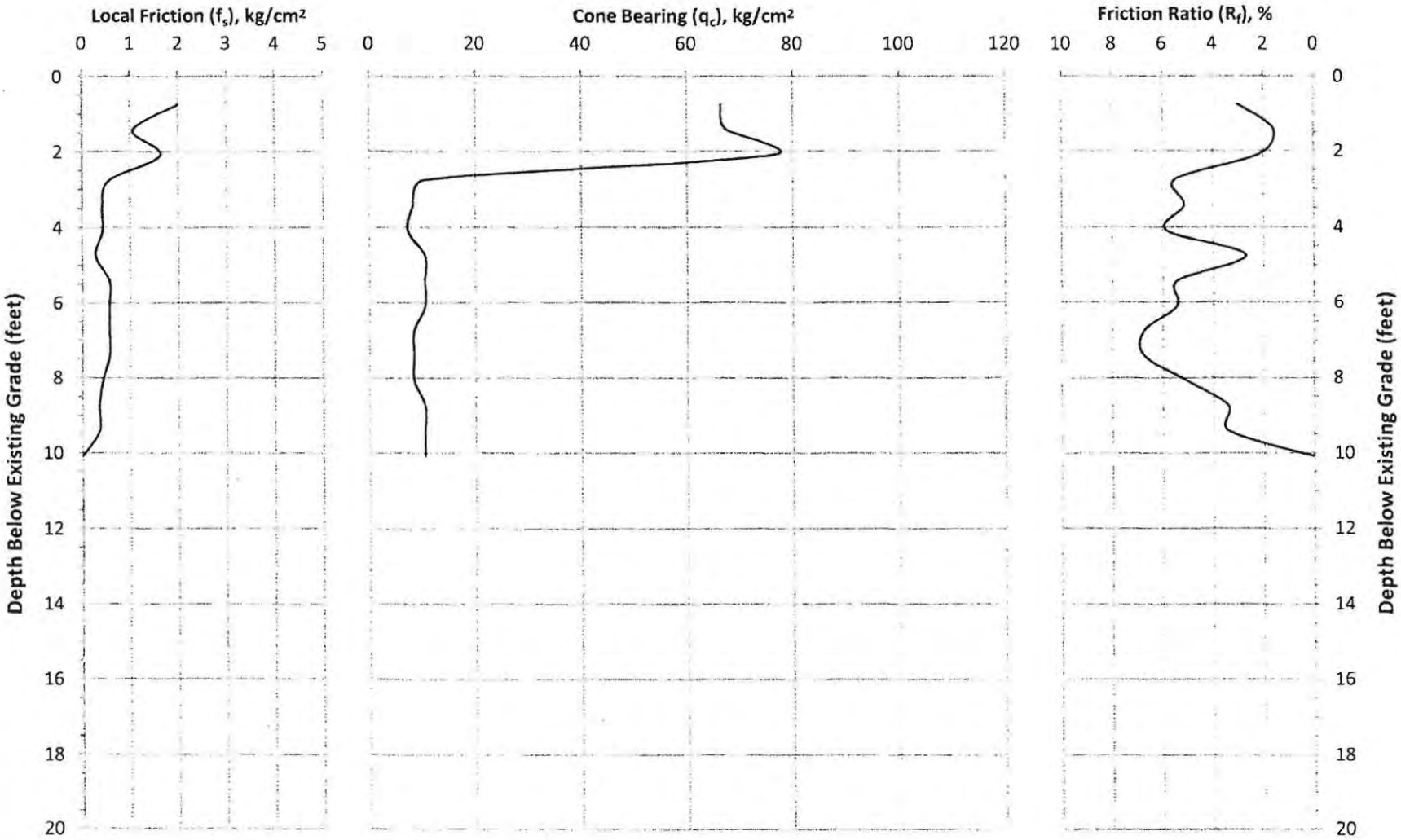

Figure B-03a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-05**
Location: **SS2-05**
Surface Elevation: **1149.6 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

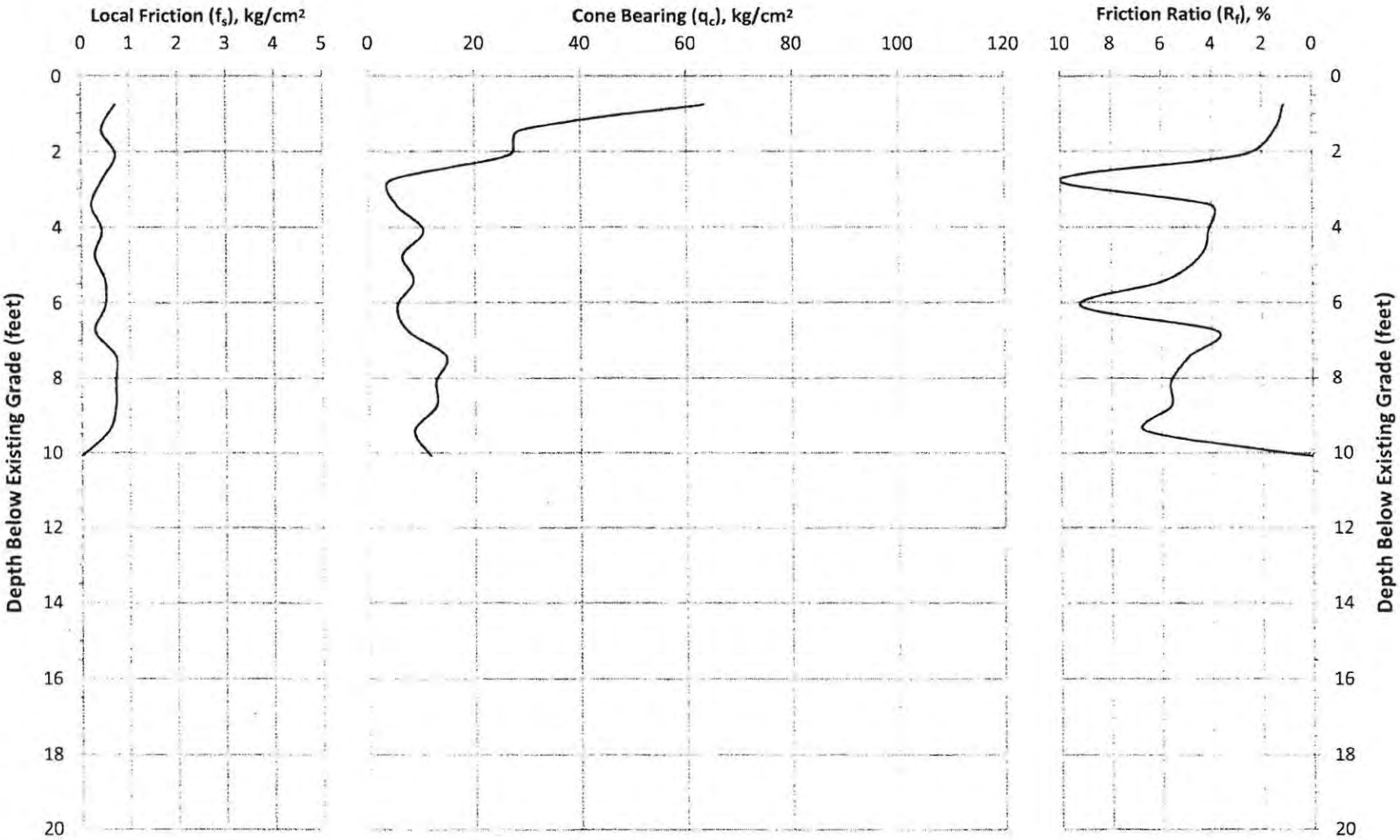

Figure B-04a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-06**
Location: **SS2-06**
Surface Elevation: **1151.1 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

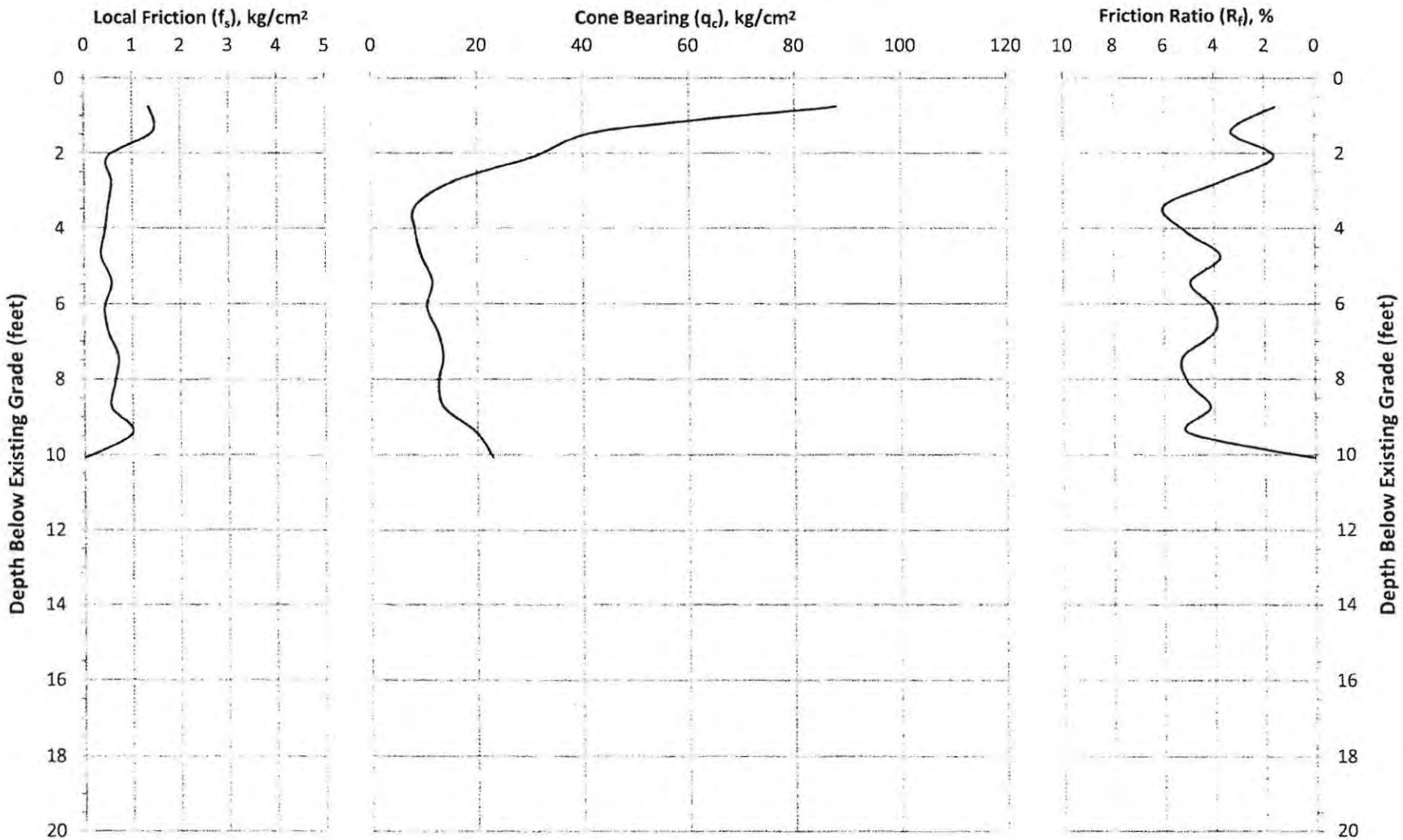

Figure B-05a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-08**
Location: **SS2-08**
Surface Elevation: **1150.3 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

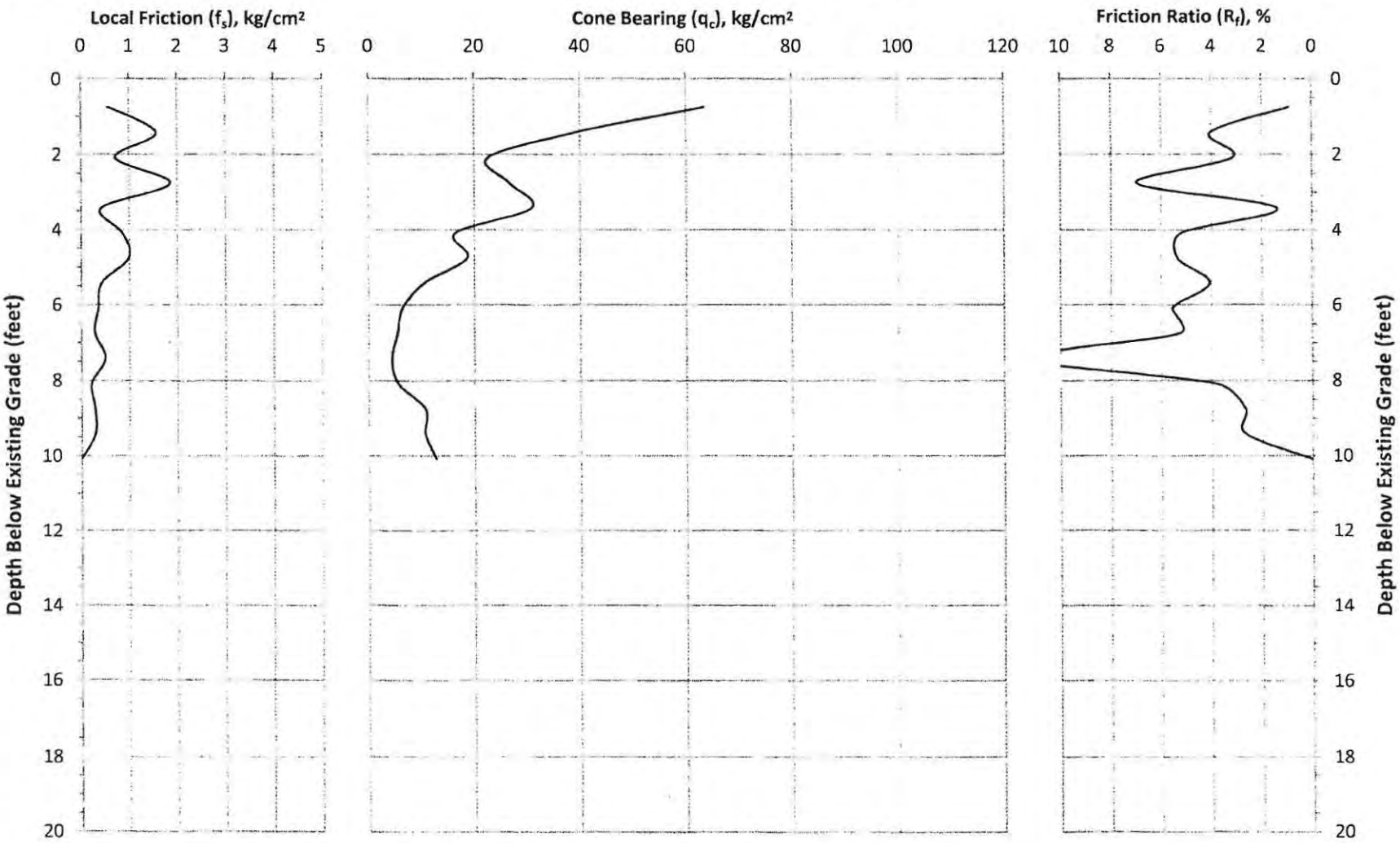

Figure B-06a

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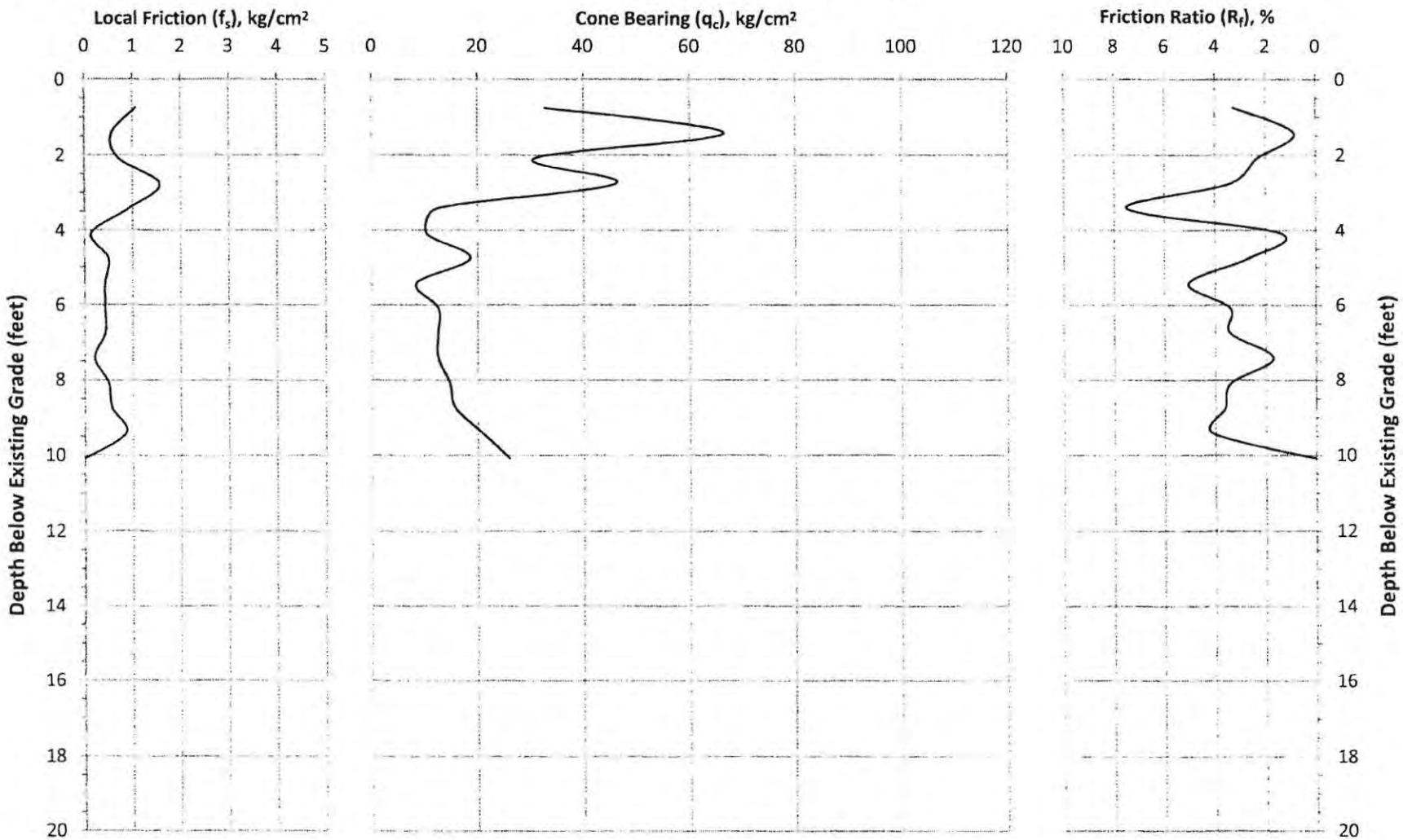
Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-09**
Location: **SS2-09**
Surface Elevation: **1151.1 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**



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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-10**
Location: **SS2-10**
Surface Elevation: **1148.5 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

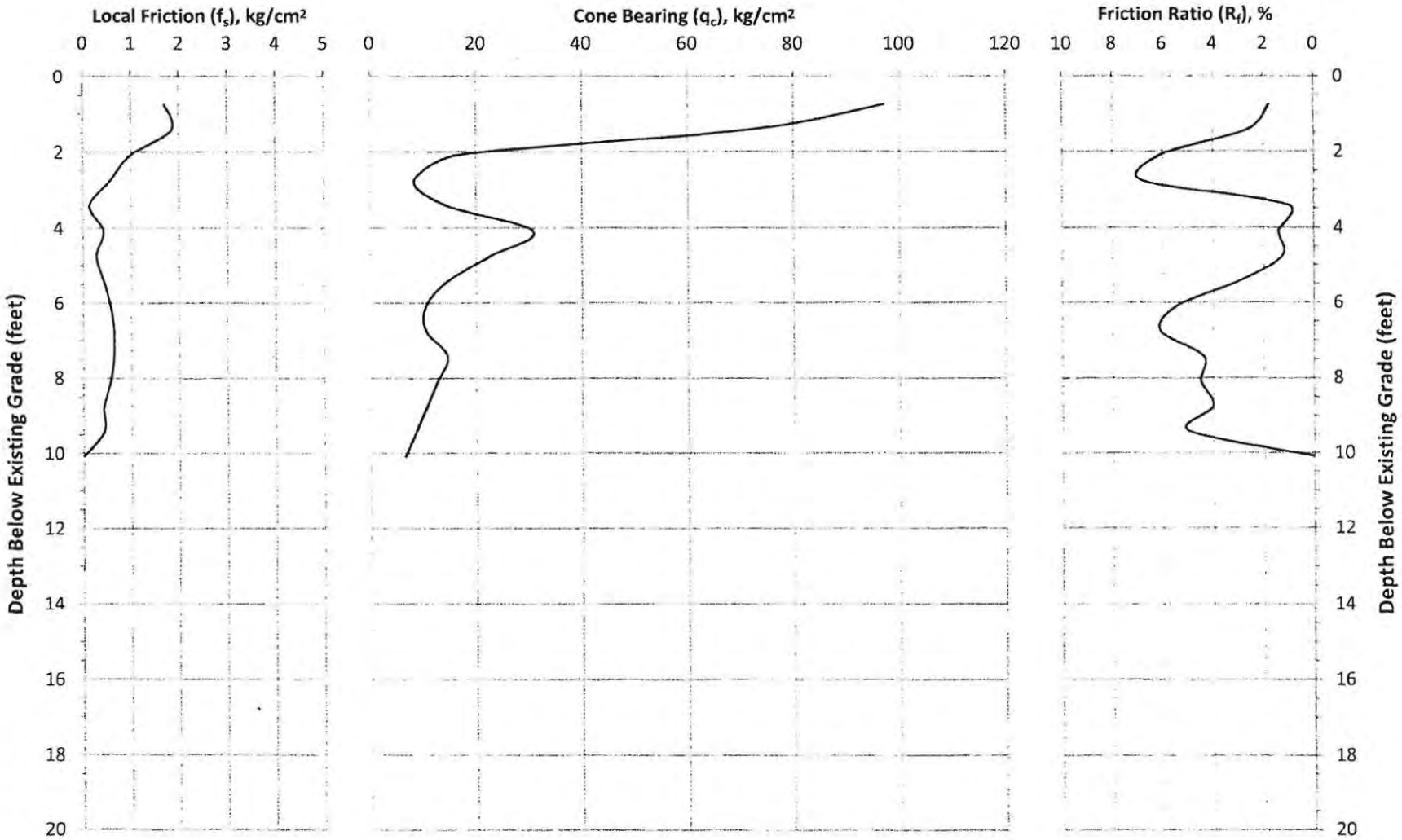

Figure B-08a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-11**
Location: **SS2-11**
Surface Elevation: **1148.7 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

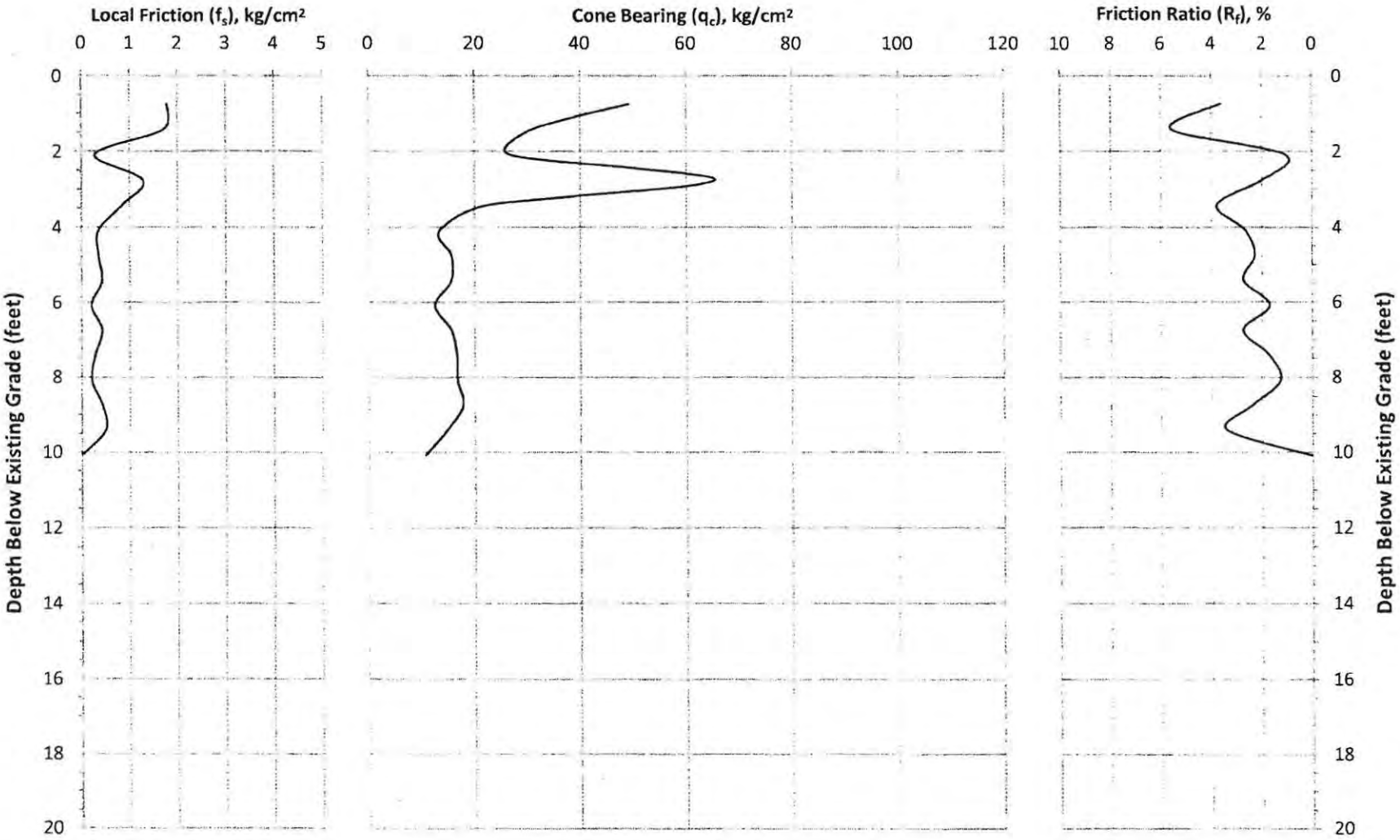

Figure B-09a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-12**
Location: **SS2-12**
Surface Elevation: **1150.6 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

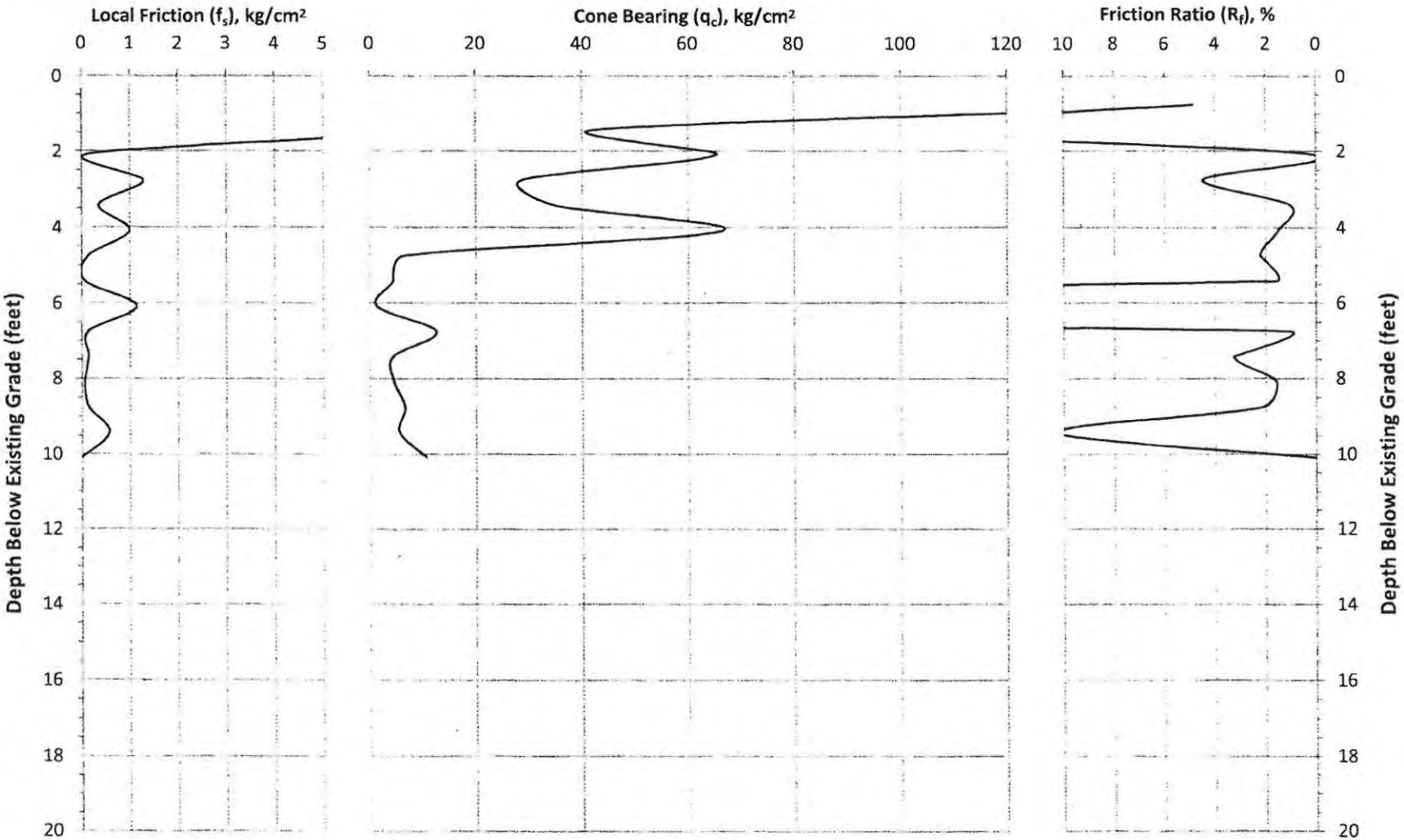

Figure B-10a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-13**
Location: **SS2-13**
Surface Elevation: **1150.9 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

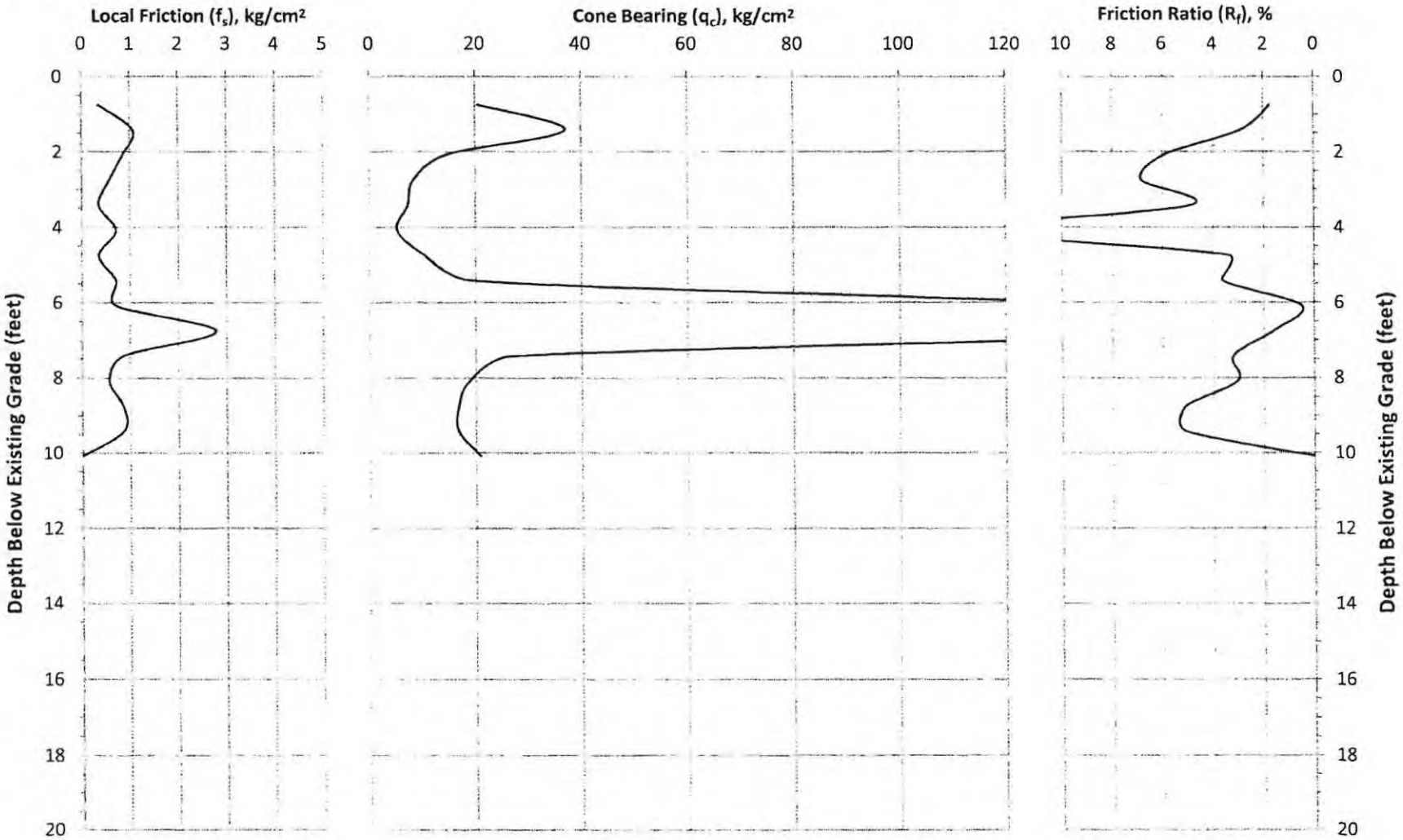

Figure B-11a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-14**
Location: **SS2-14**
Surface Elevation: **1148.5 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

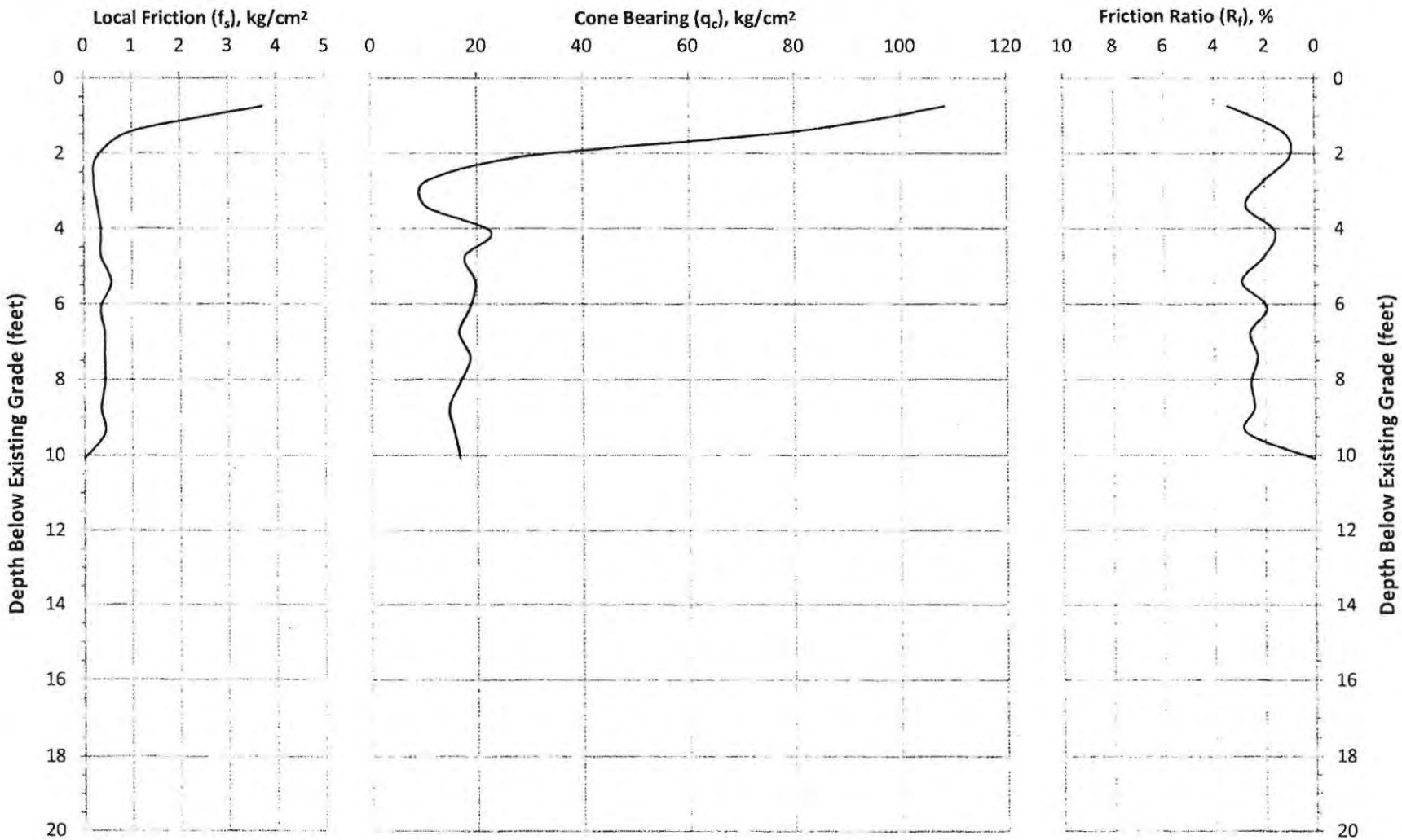

Figure B-12a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-15**
Location: **SS2-15**
Surface Elevation: **1148.9 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

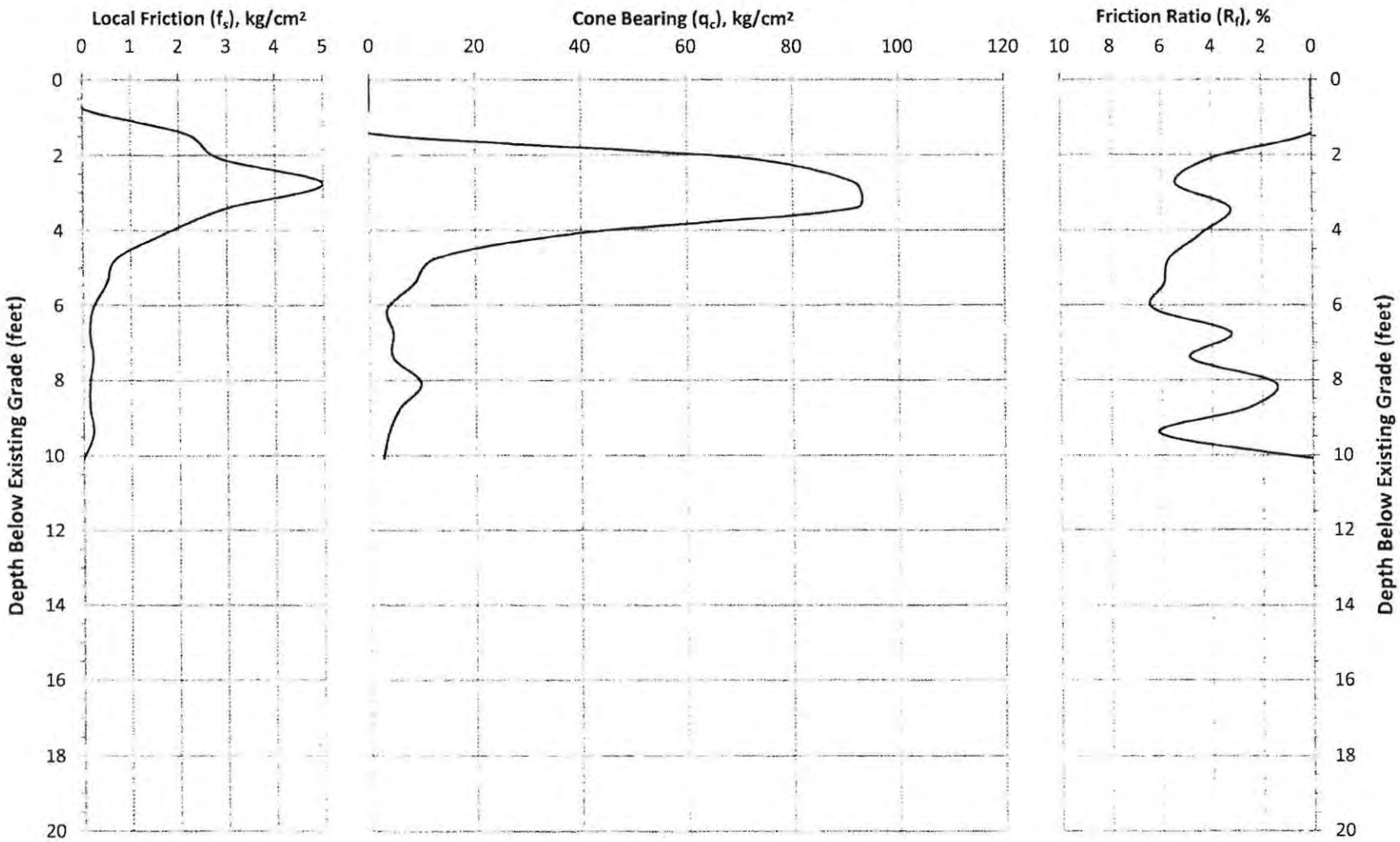

Figure B-13a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-16**
Location: **SS2-16**
Surface Elevation: **1150.6 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

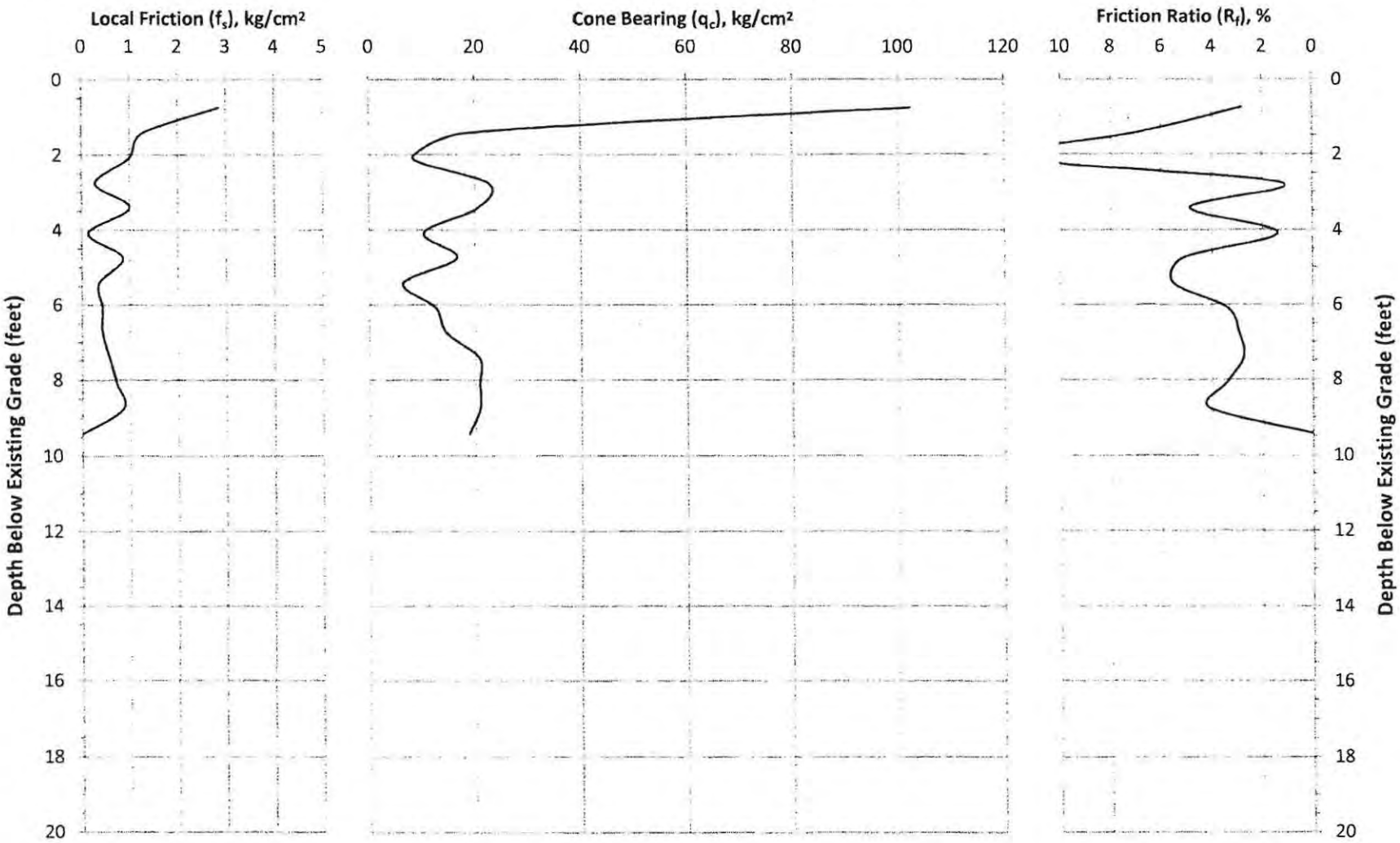

Figure B-14a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-17**
Location: **SS2-17**
Surface Elevation: **1151.7 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

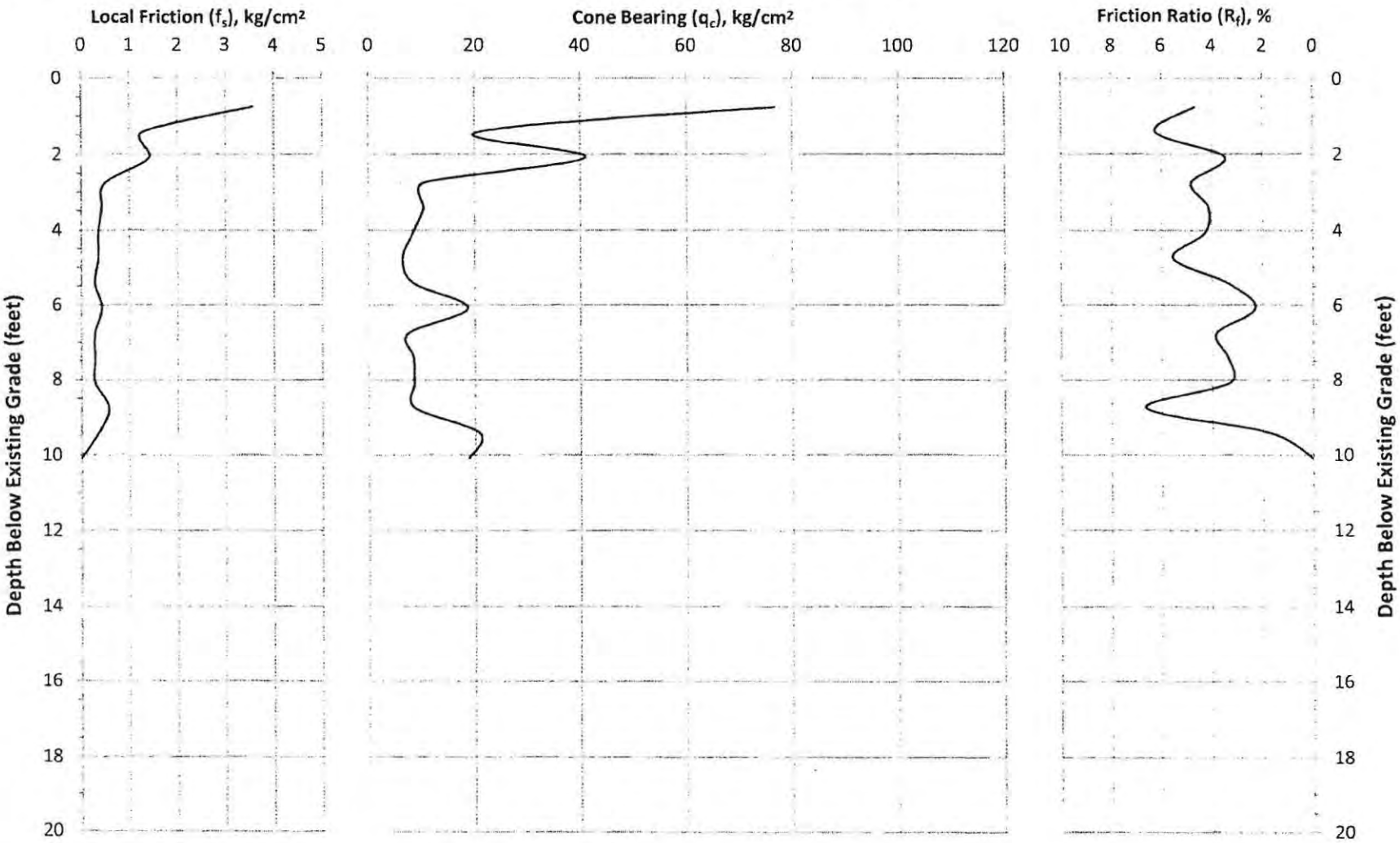

Figure B-15a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-18**
Location: **SS2-18**
Surface Elevation: **1148.7 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

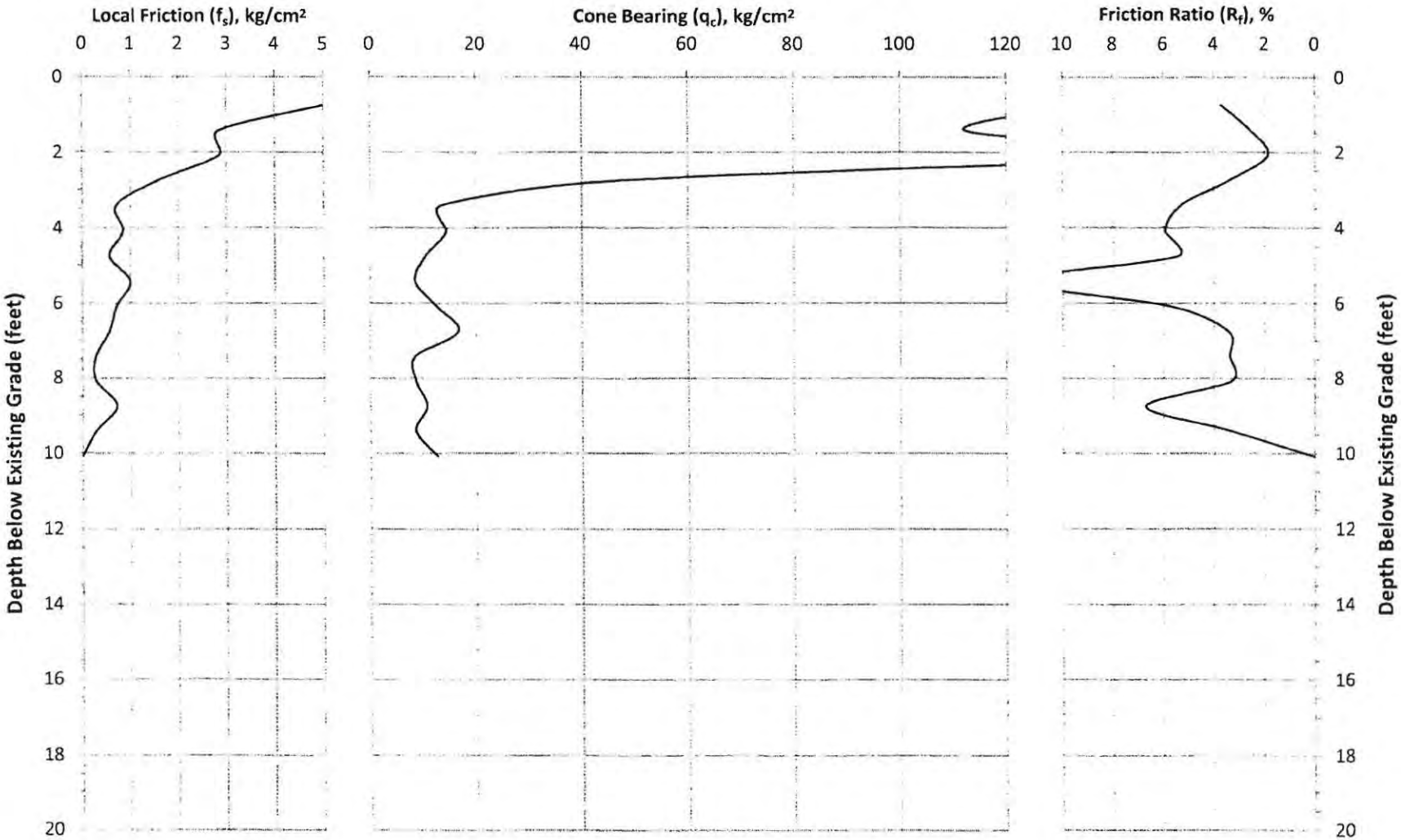

Figure B-16a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-19**
Location: **SS2-19**
Surface Elevation: **1149.5 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

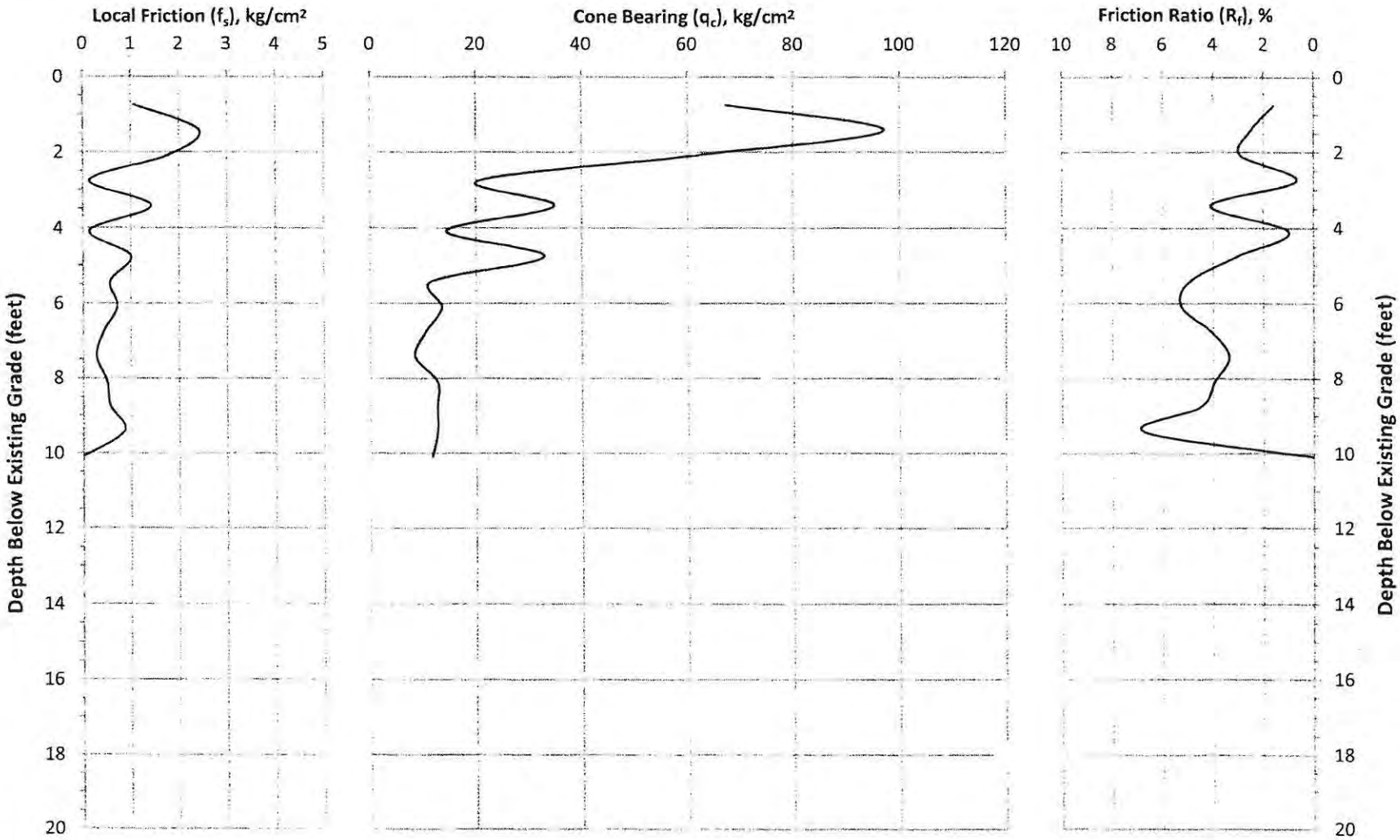

Figure B-17a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-20**
Location: **SS2-20**
Surface Elevation: **1150.2 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

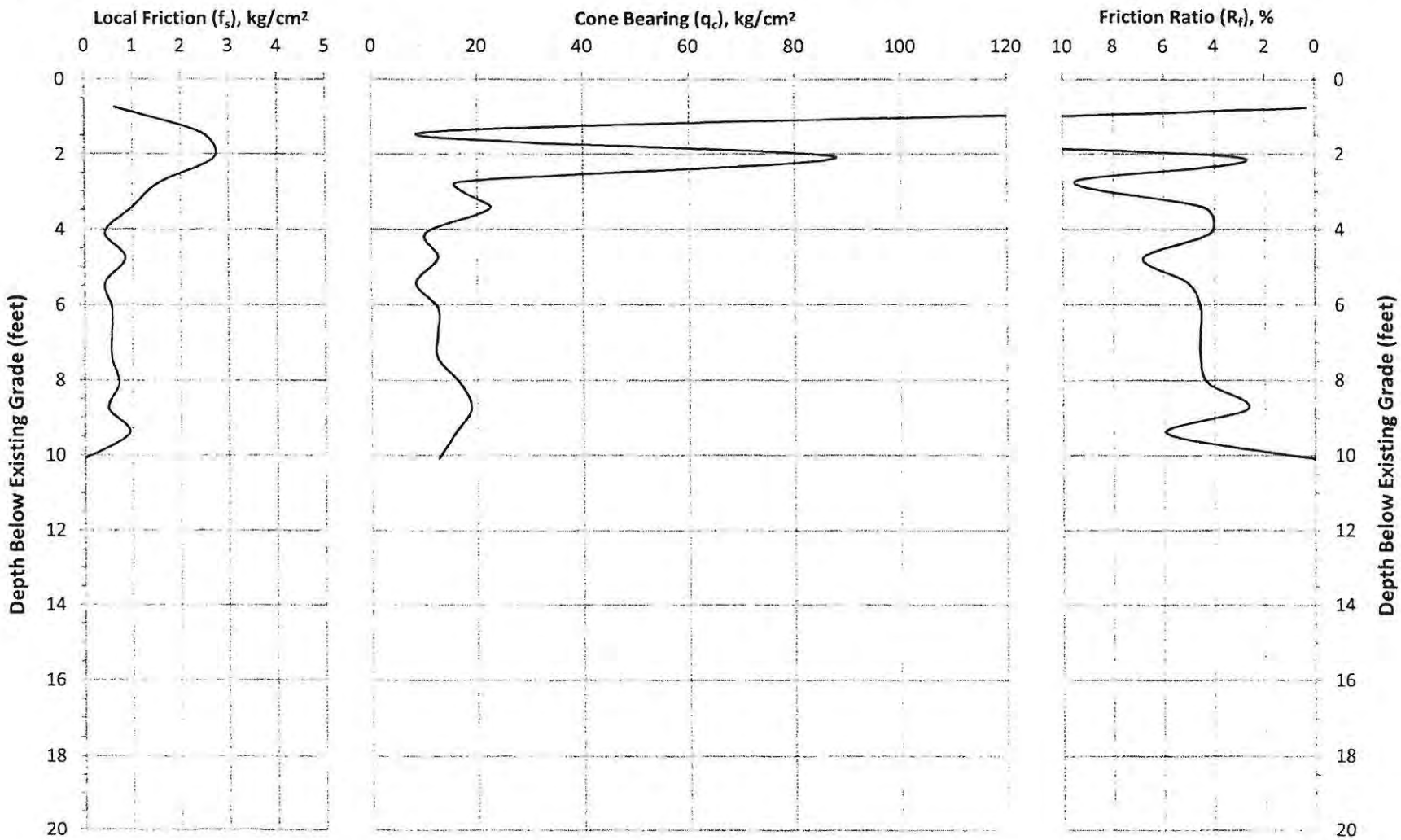

Figure B-18a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-21**
Location: **SS2-21**
Surface Elevation: **1152.1 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

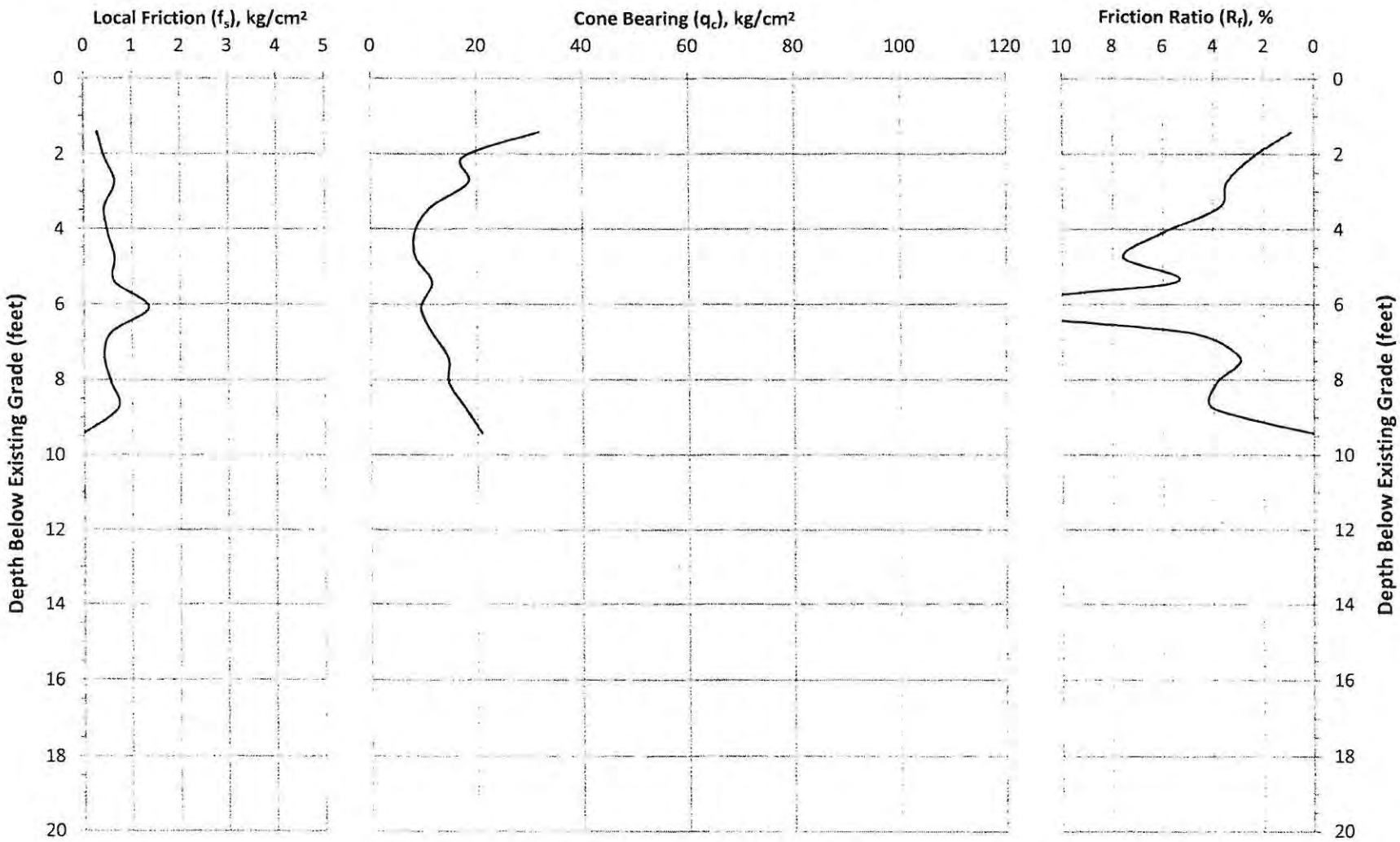

Figure B-19a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-22**
Location: **SS2-22**
Surface Elevation: **1149.0 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

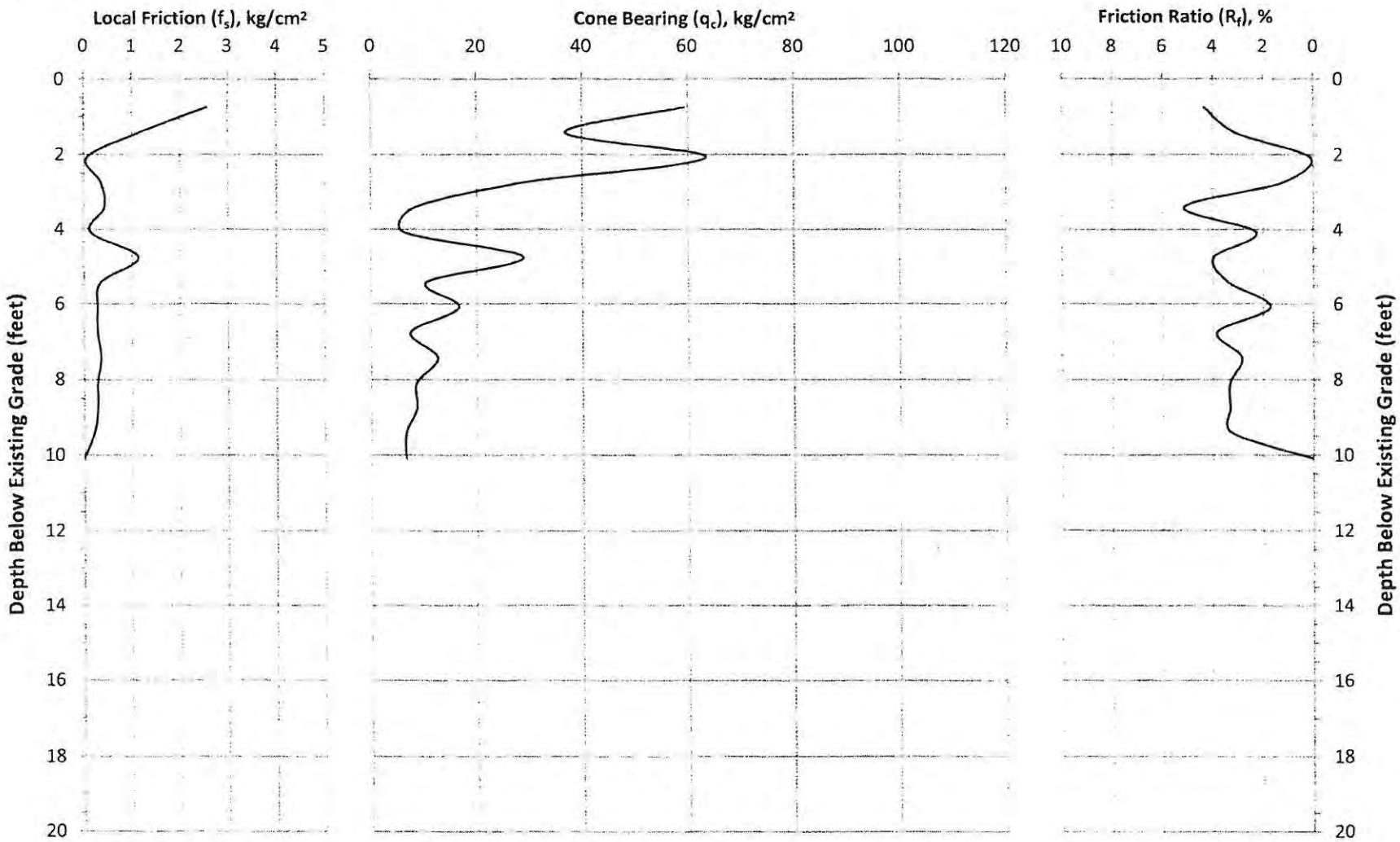

Figure B-20a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-23**
Location: **SS2-23**
Surface Elevation: **1149.9 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

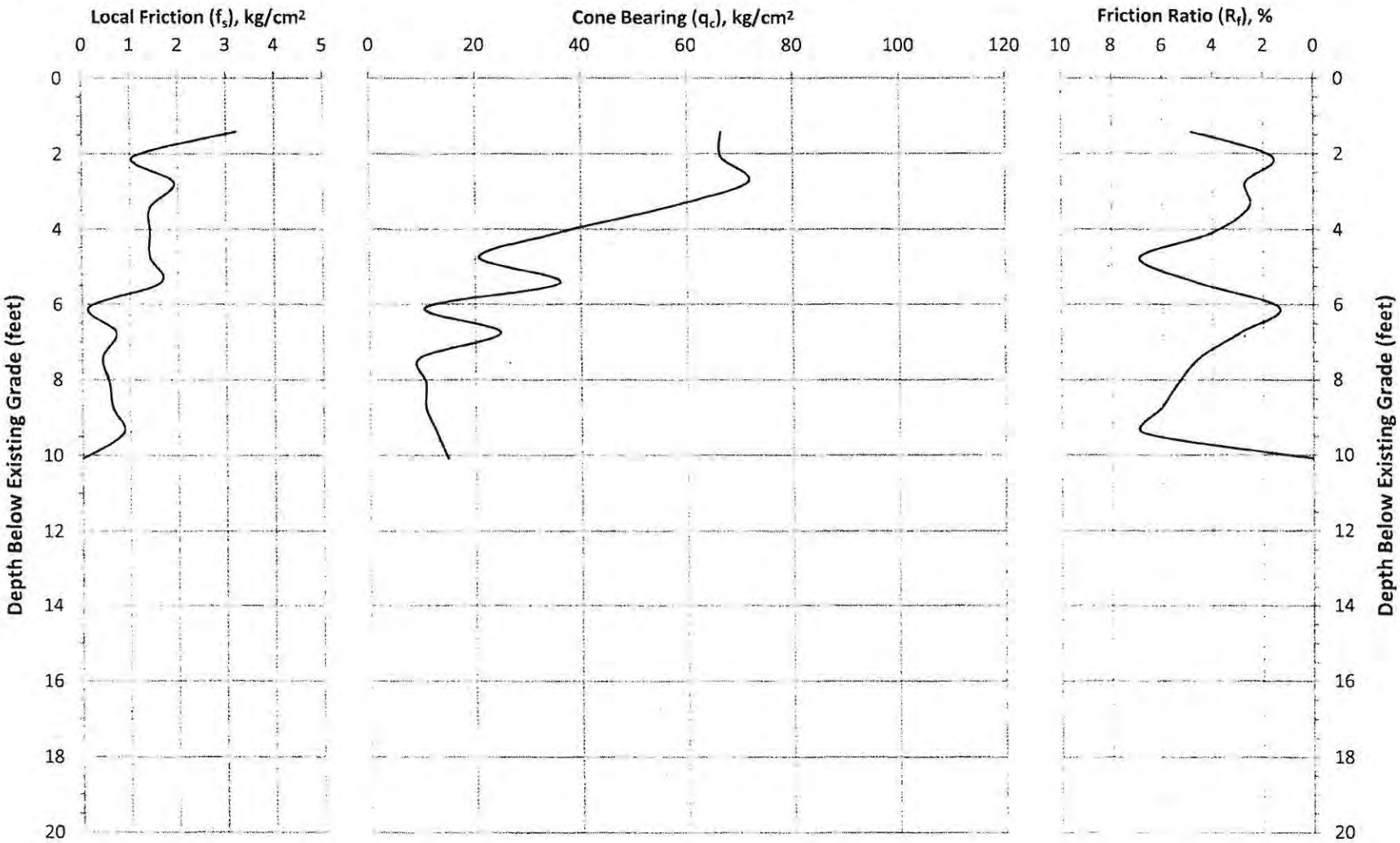

Figure B-21a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-24**
Location: **SS2-24**
Surface Elevation: **1150.6 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

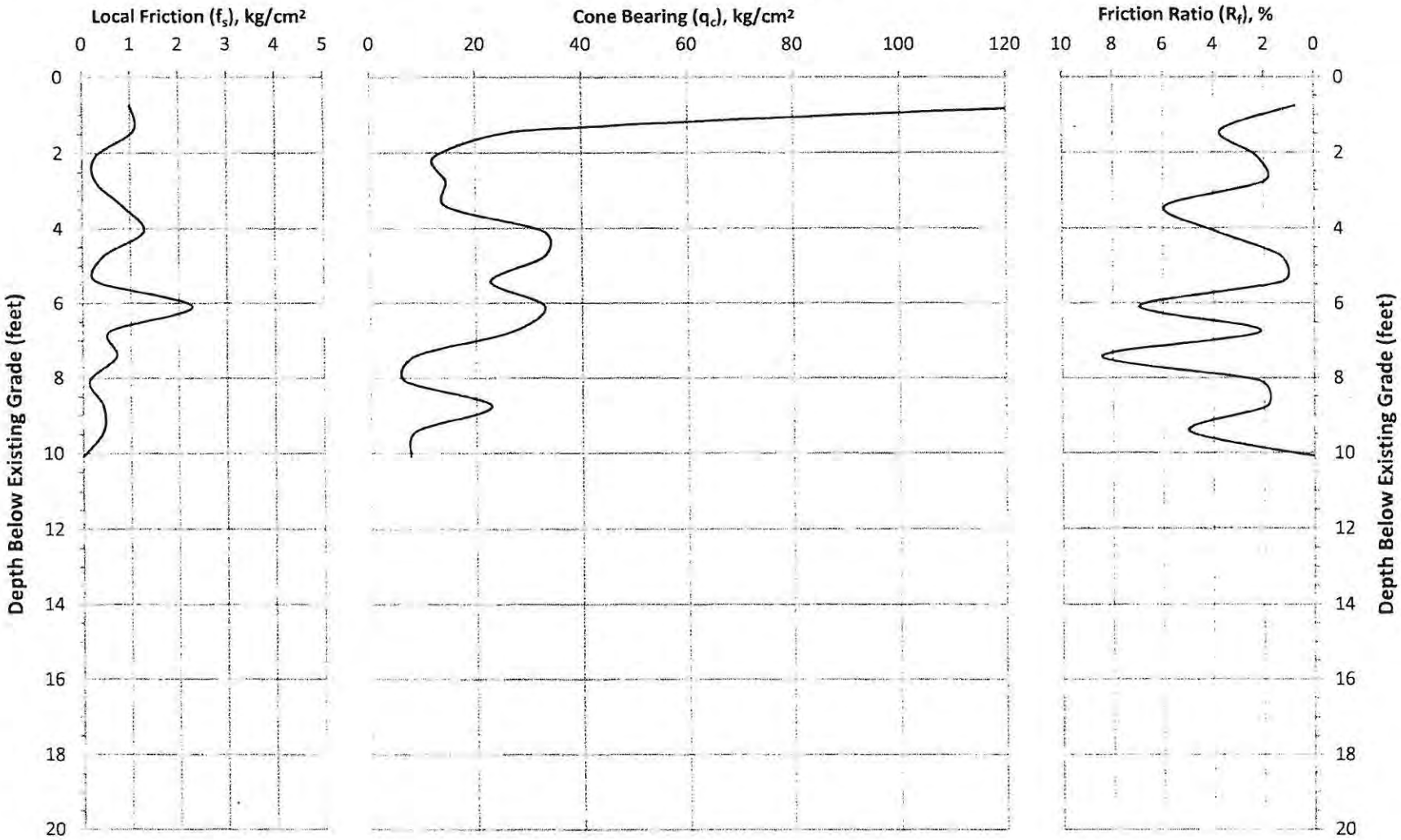

Figure B-22a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-25**
Location: **SS2-25**
Surface Elevation: **1151.5 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

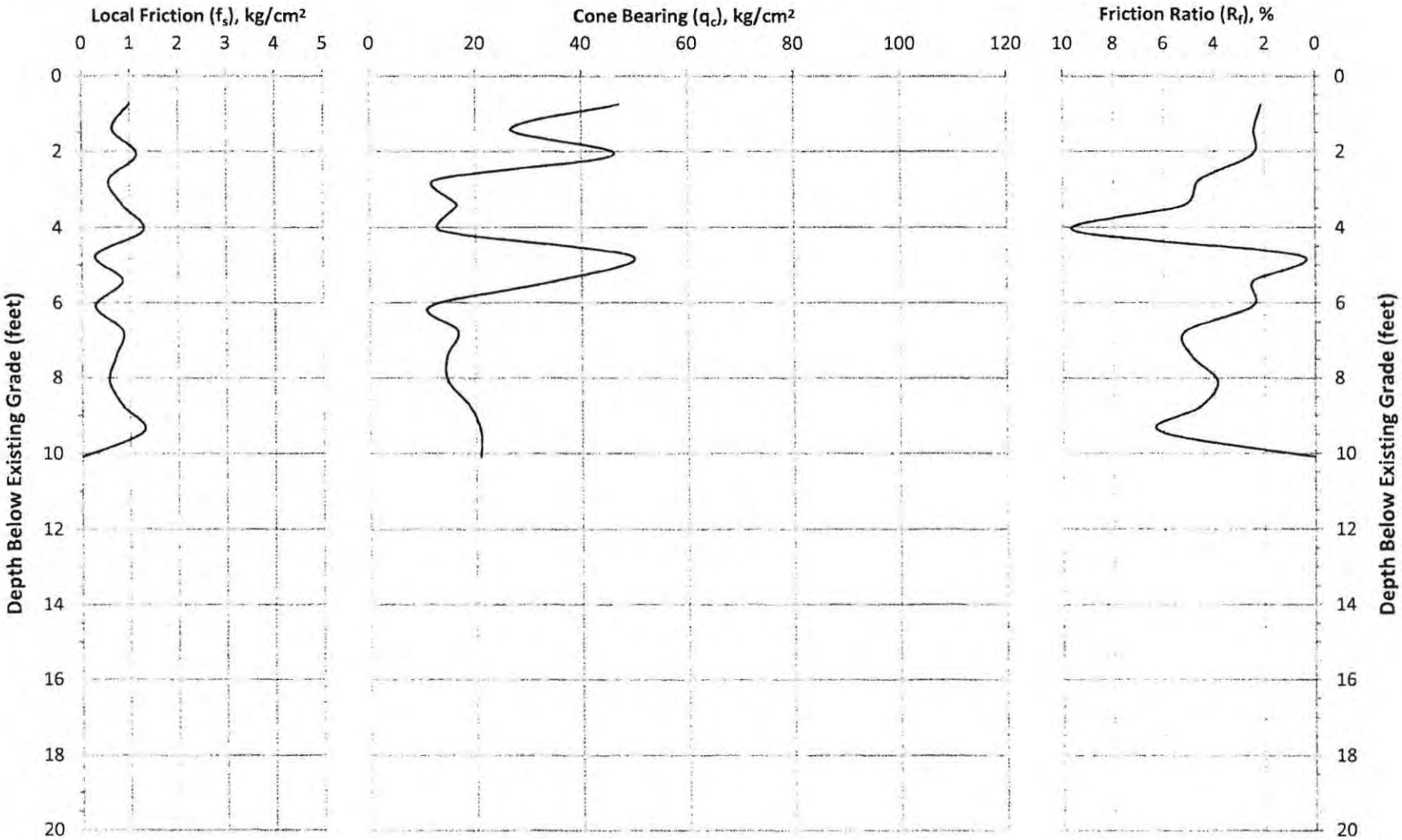

Figure B-23a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-26**
Location: **SS2-26**
Surface Elevation: **1148.9 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

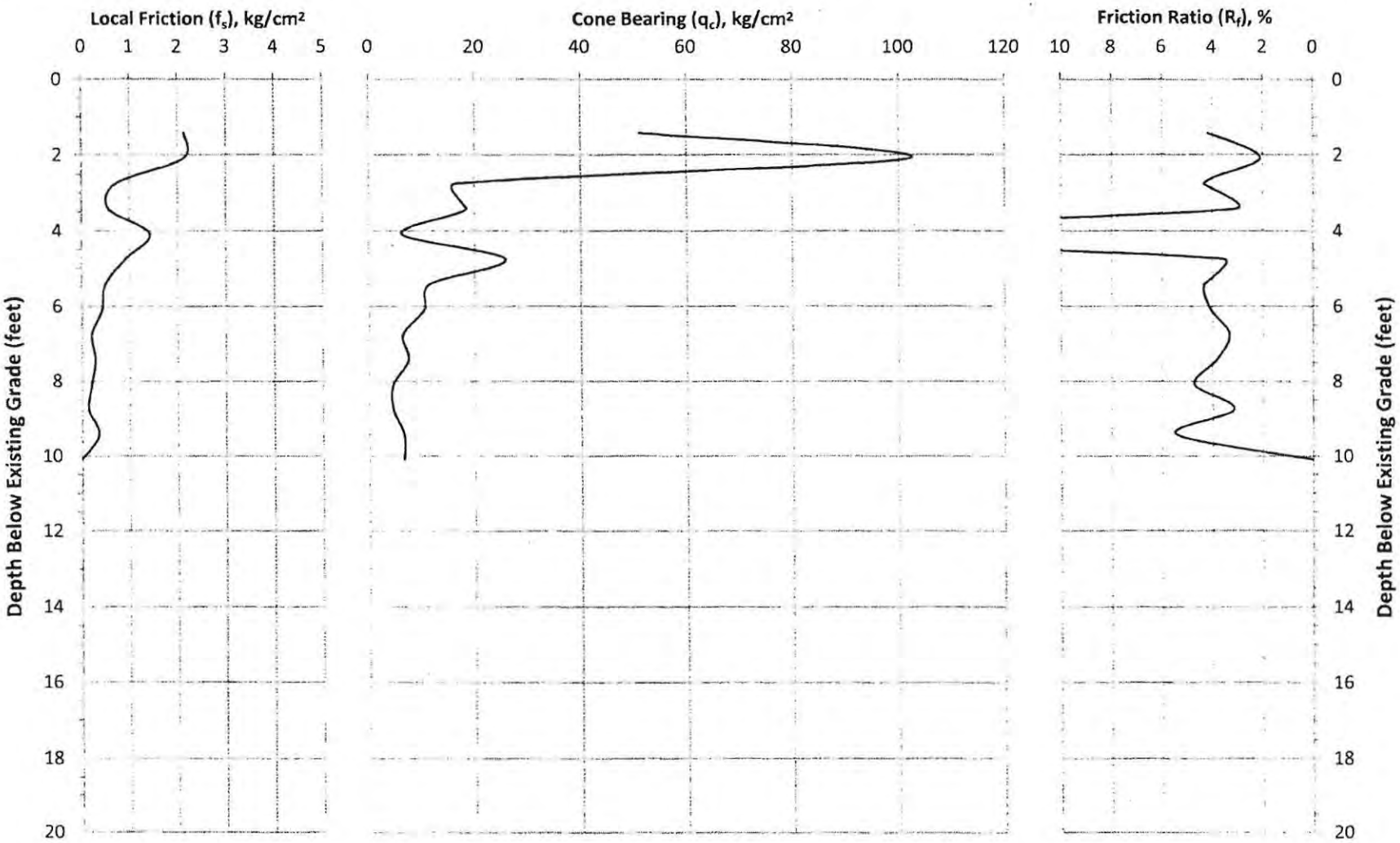

Figure B-24a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-27**
Location: **SS2-27**
Surface Elevation: **1149.9 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

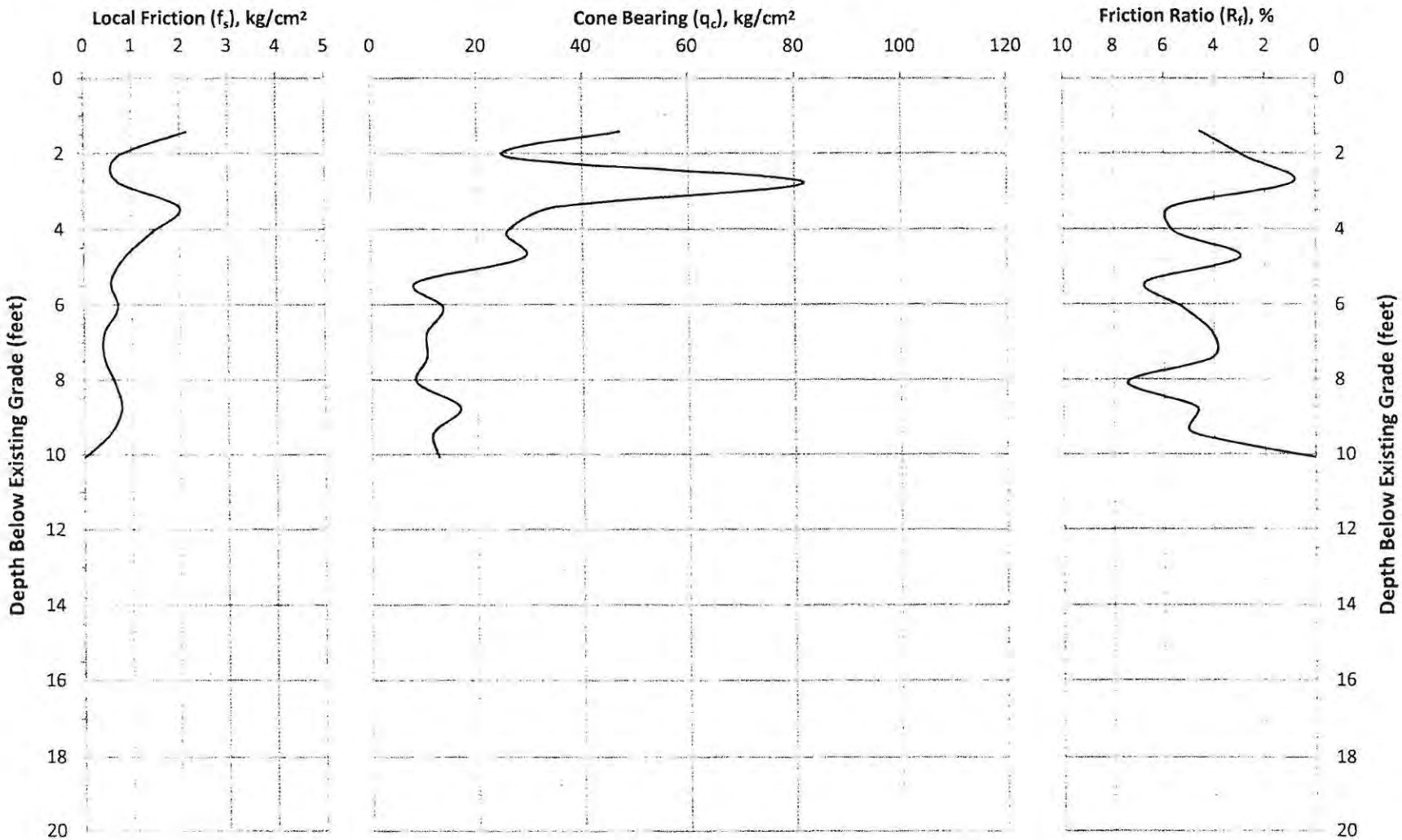

Figure B-25a

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ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-28**
Location: **SS2-28**
Surface Elevation: **1150.6 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

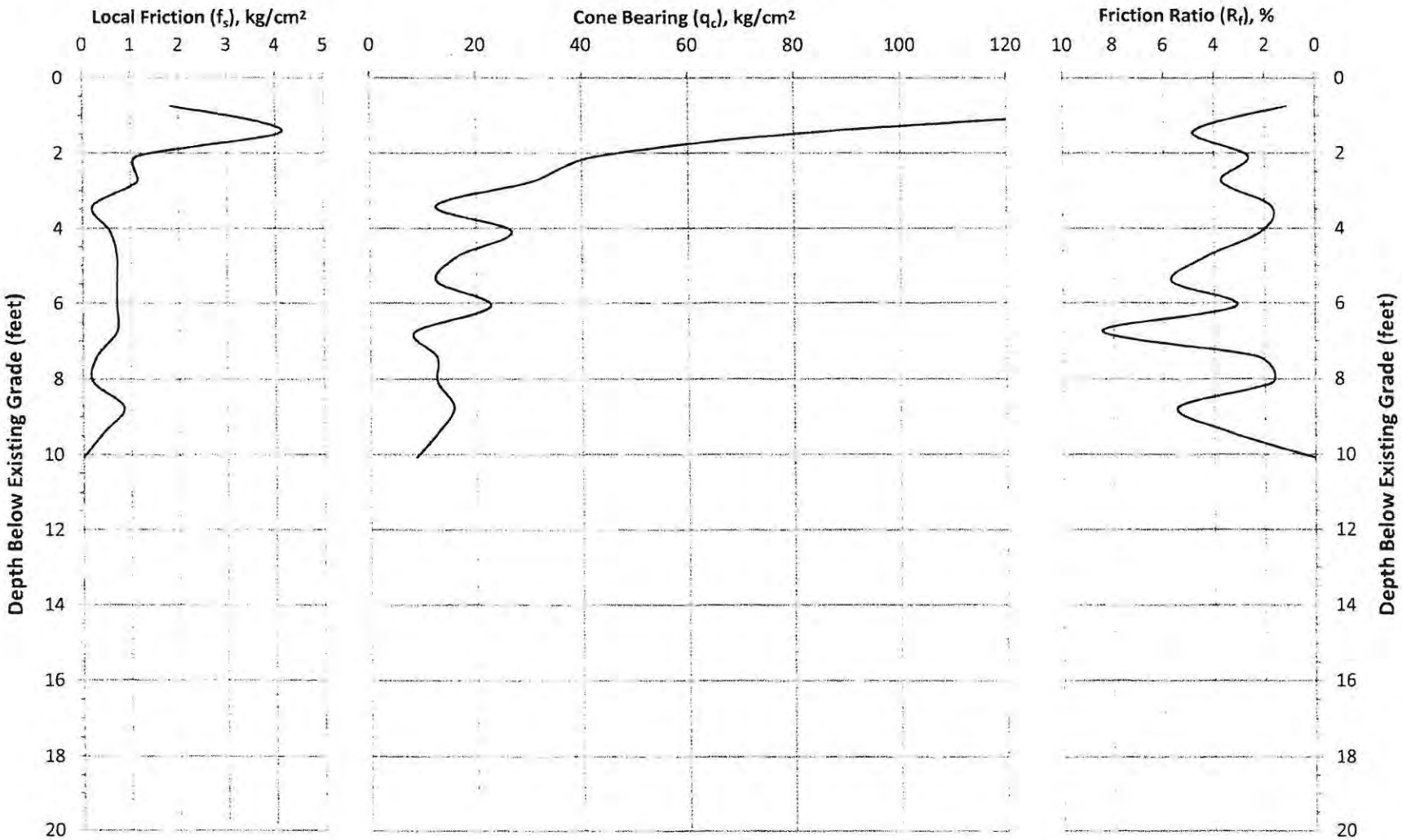

Figure B-26a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-29**
Location: **SS2-29**
Surface Elevation: **1151.4 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

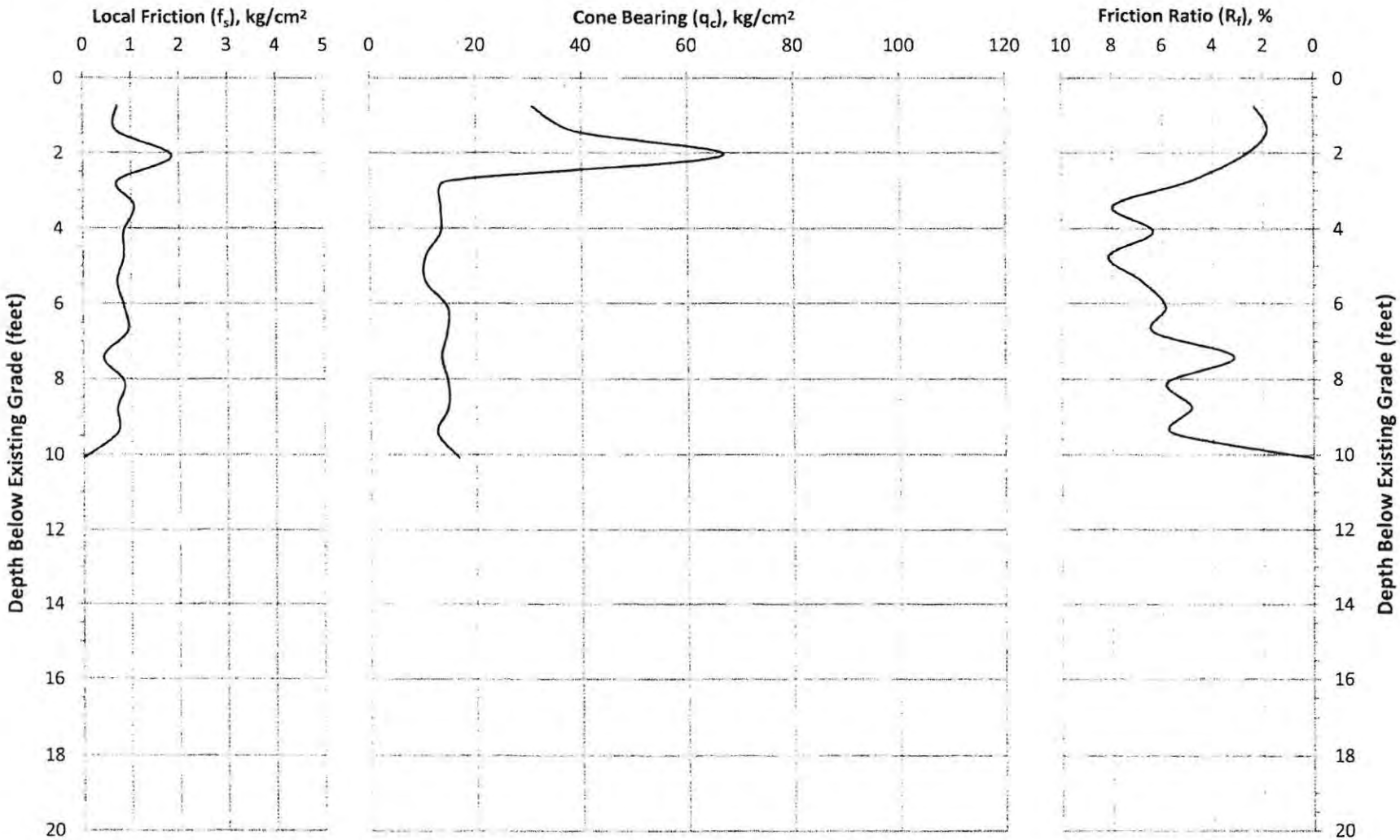

Figure B-27a

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-30**
Location: **SS2-30**
Surface Elevation: **1149.1 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

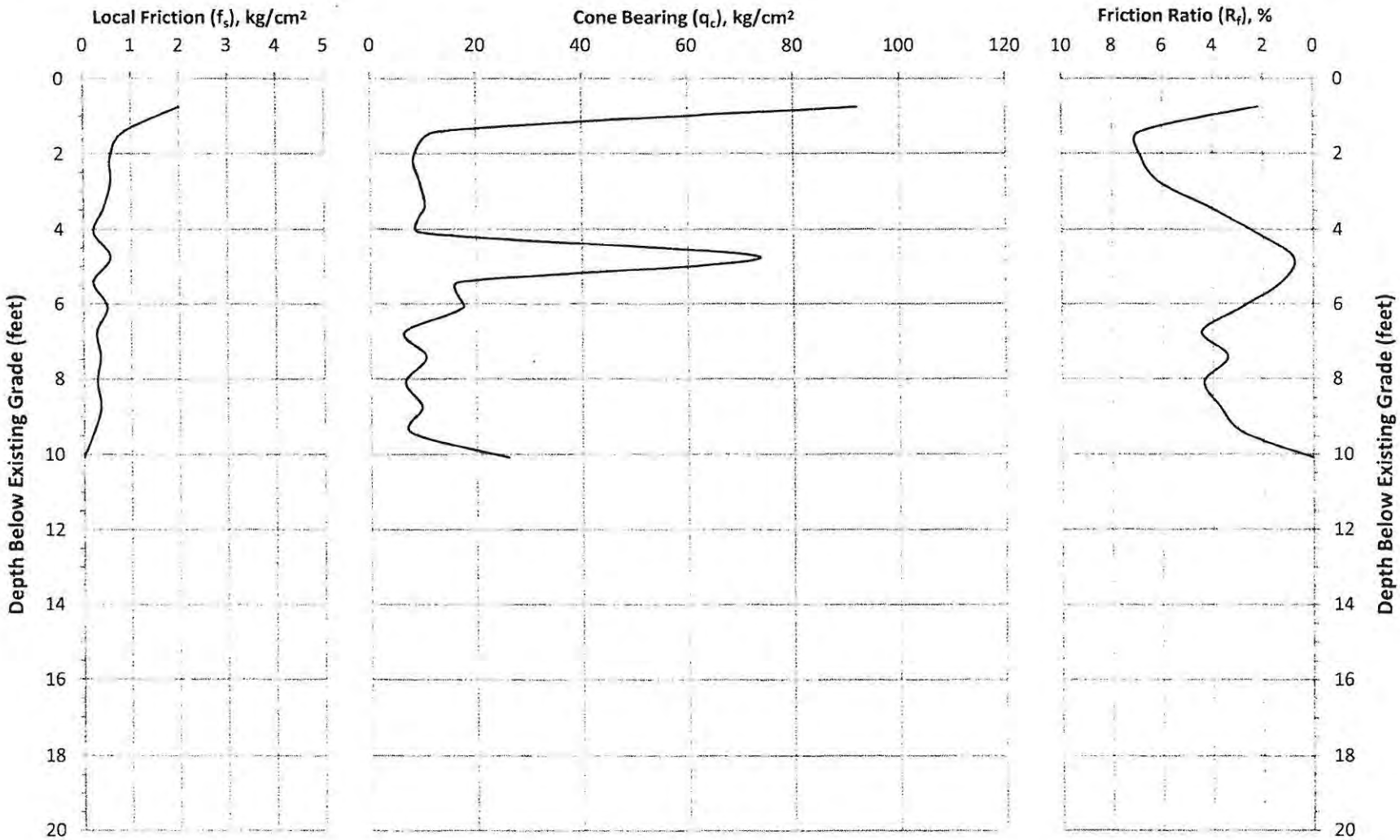

Figure B-28a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

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Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-32**
Location: **SS2-32**
Surface Elevation: **1150.9 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

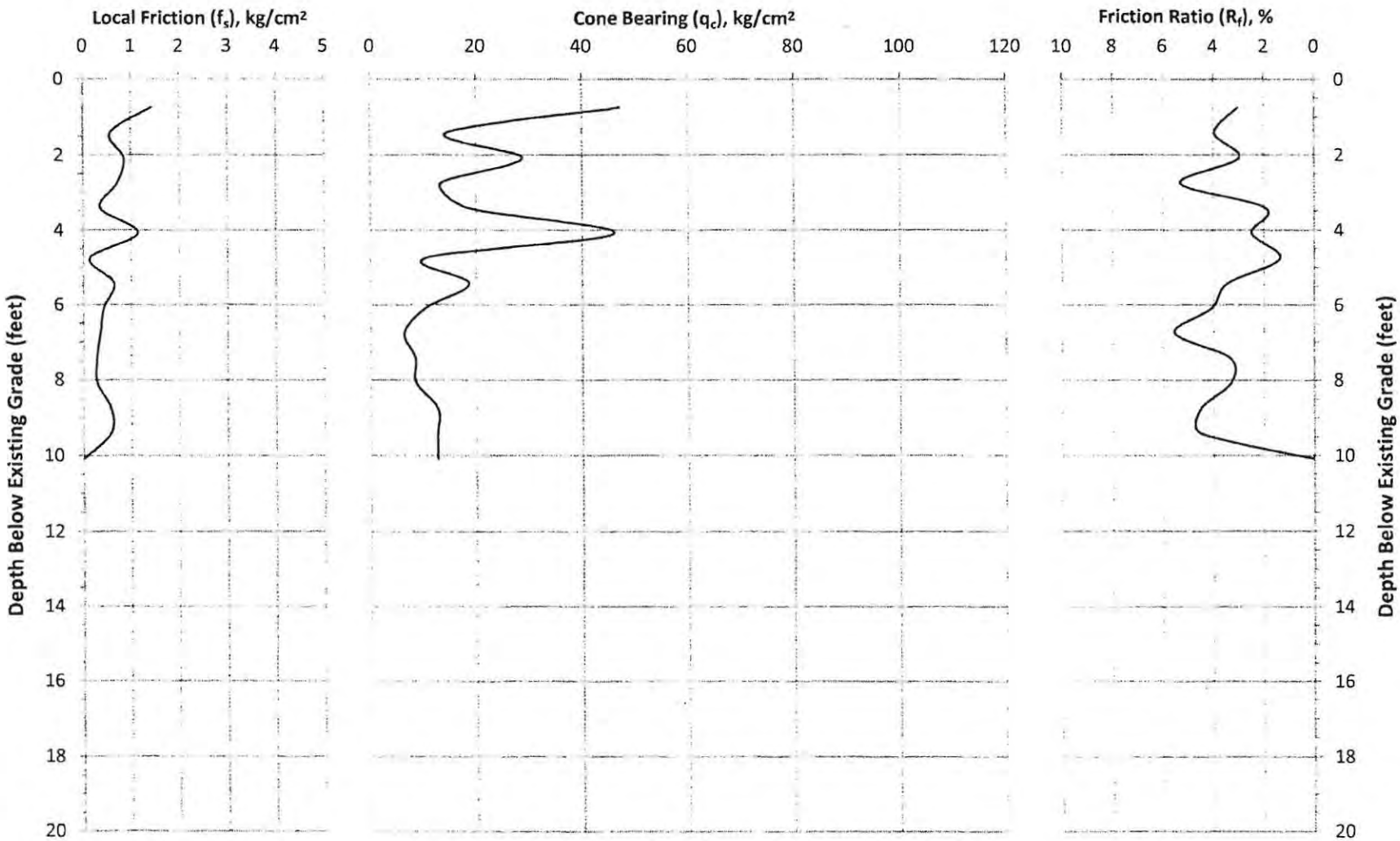

Figure B-30a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-33**
Location: **SS2-33**
Surface Elevation: **1151.5 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

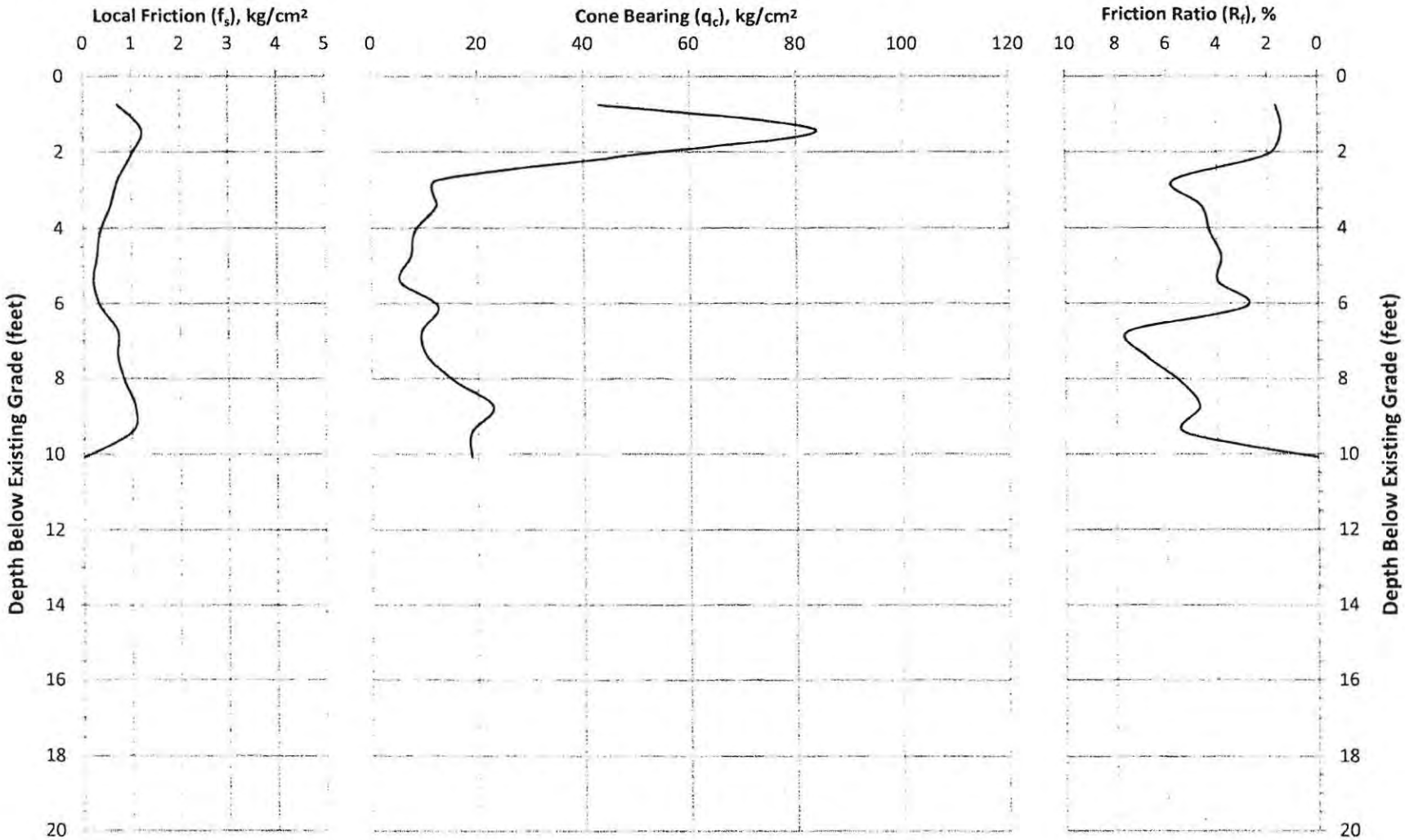

Figure B-31a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-34**
Location: **SS2-34**
Surface Elevation: **1150.1 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

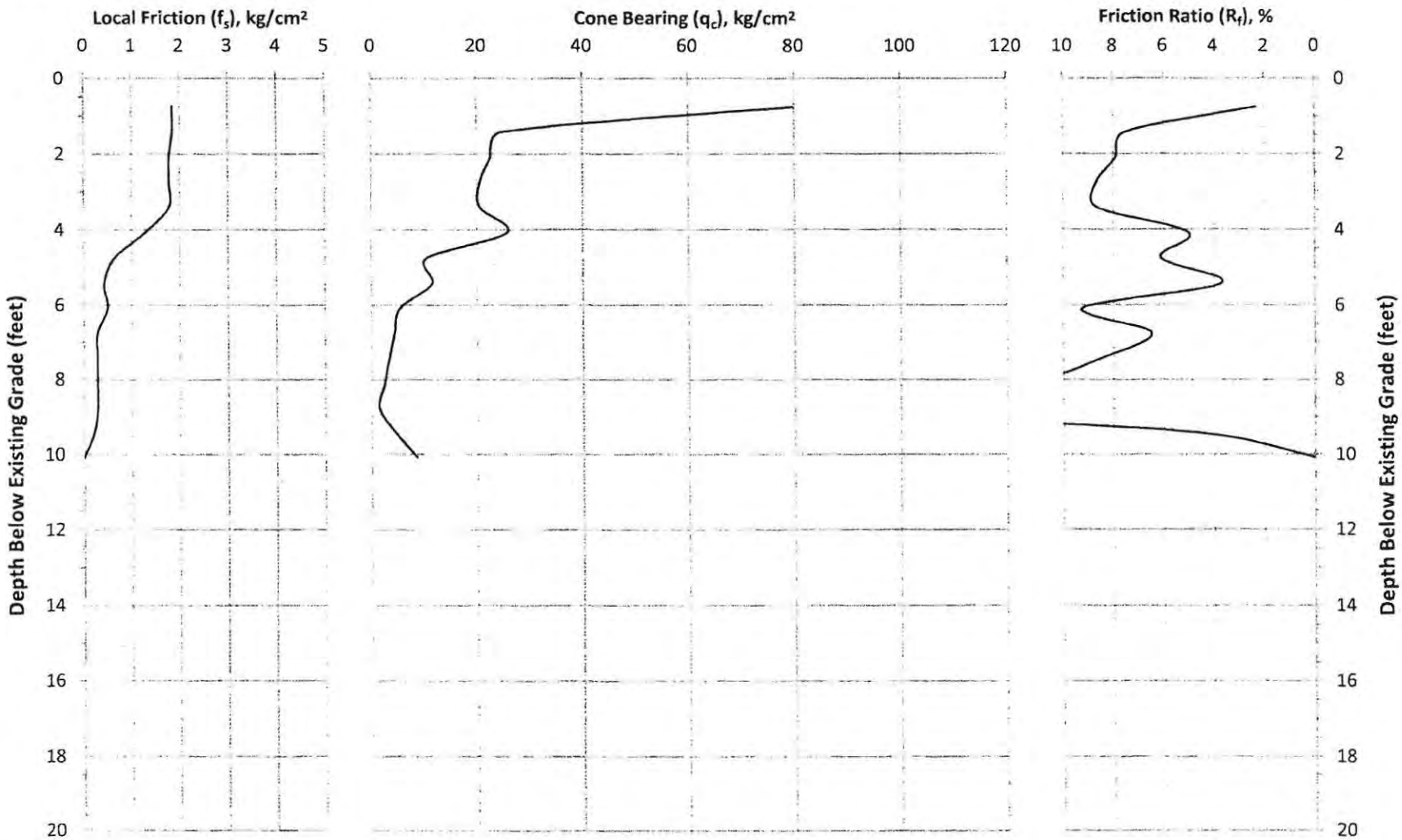

Figure B-32a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-35**
Location: **SS2-35**
Surface Elevation: **1150.1 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

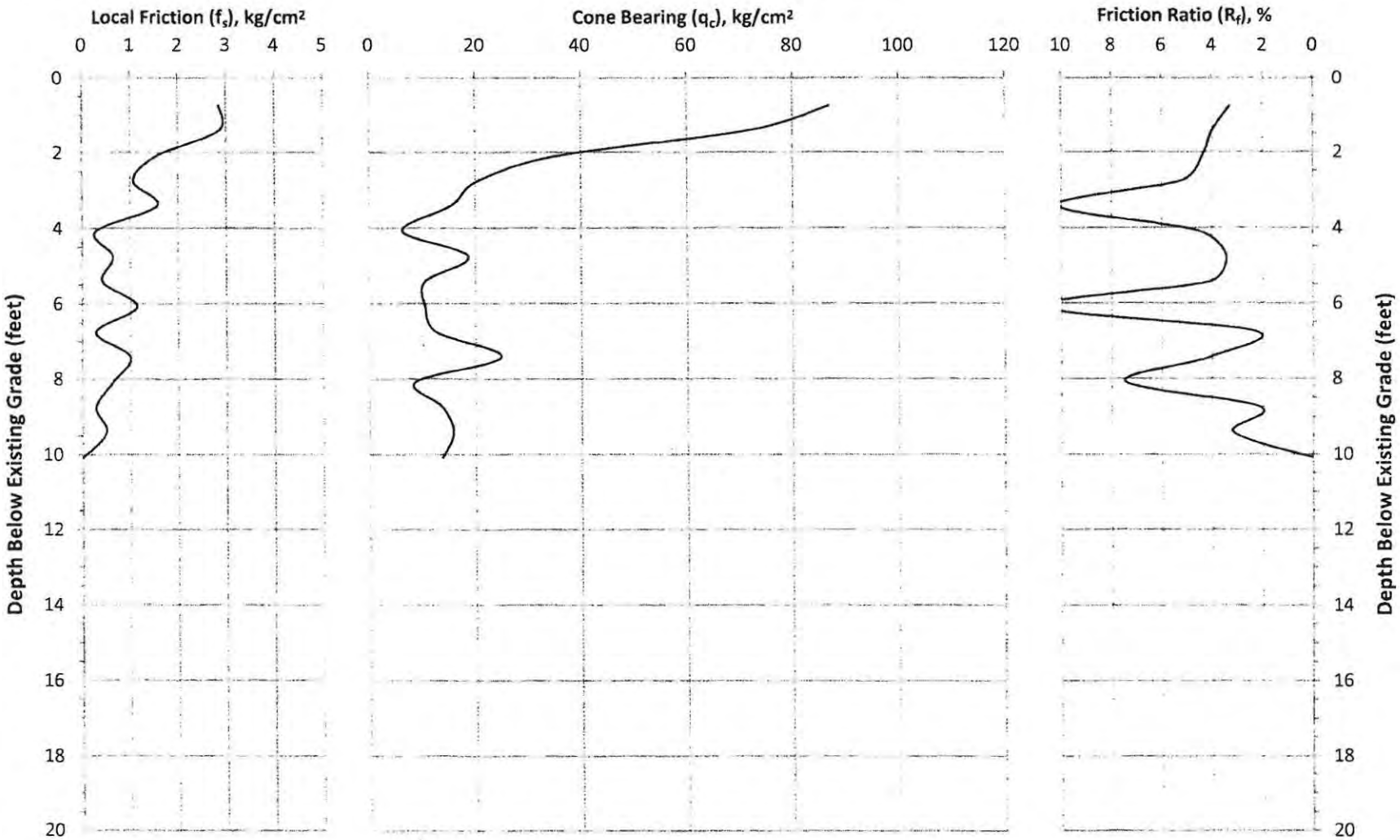

Figure B-33a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-36**
Location: **SS2-36**
Surface Elevation: **1150.8 feet**

Date: **3/15/2011**
Tested By: **PN**
Recorded By: **LI**

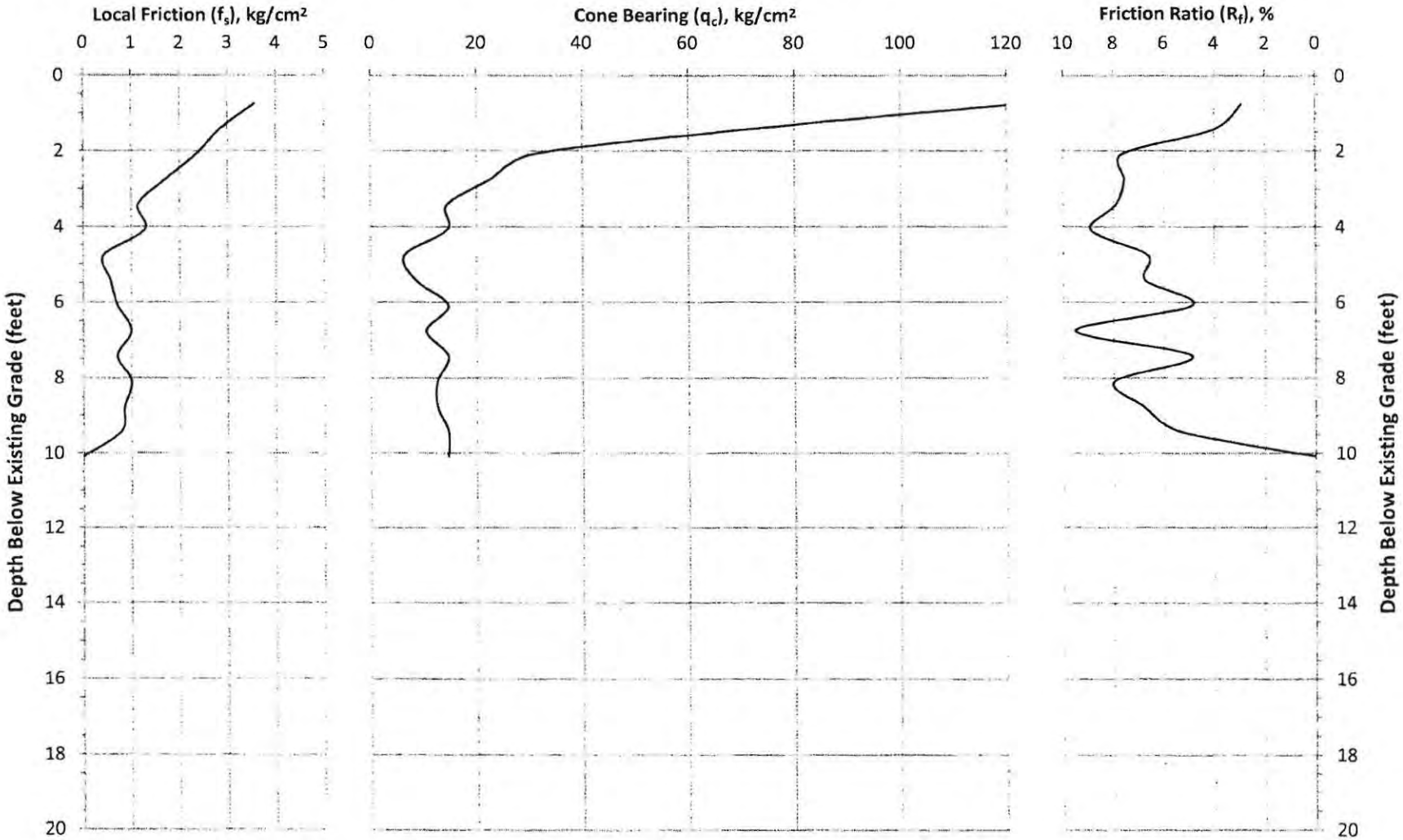

Figure B-34a

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PENETRATION DIAGRAM OF FRICTION CONE PENETROMETER

ASTM D3441

Project Name: **South "Hole-in-the-Donut" Soil Survey**
Project Location: **West Haymarket Project; Lincoln, NE**
Project Number: **00110208.00**

Sounding No: **S-37**
Location: **SS2-37**
Surface Elevation: **1151.3 feet**

Date: **3/16/2011**
Tested By: **PN**
Recorded By: **LI**

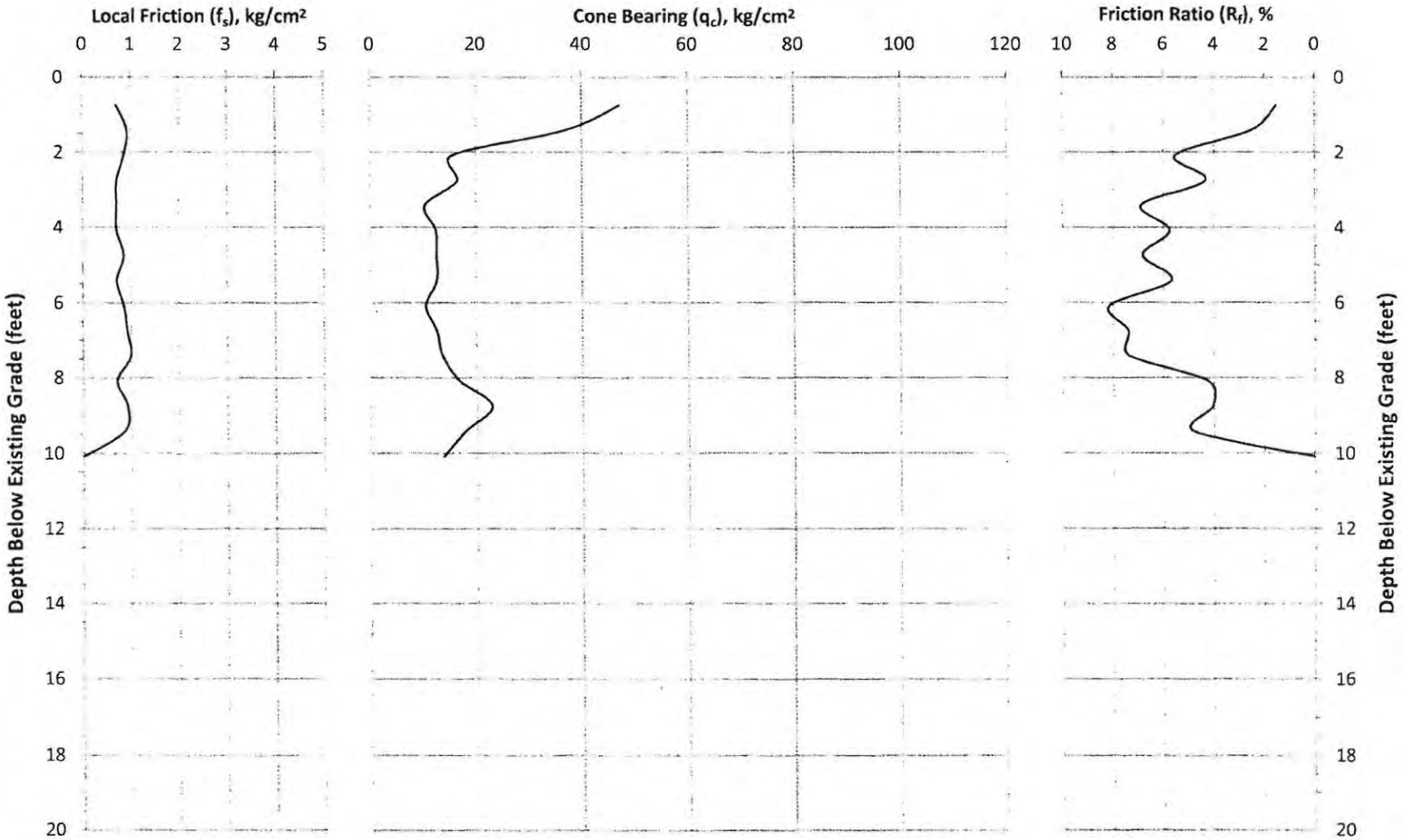

Figure B-35a

APPENDIX C. BORING LOGS

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206539.708; E 157188.716
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-01

SHEET 1 of 1

DATE: 3-16-2011

WATER LEVELS ∇ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1147.9	0.0		CL - SANDY LEAN CLAY; 40-50% fine sand; medium plasticity; black; wet to very wet; medium stiff; with cinders. (Fill)		27	0.0
1146.9	1.0		CL/ML - SILTY CLAY; low to medium plasticity; yellowish brown; wet; medium stiff. (Fill)		25.4	2.5
1144.9	3.0		ML - SILT; low plasticity; gray with black; wet to very wet; loose. (Fill)		26.5	
1142.9	5.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; black; wet; stiff. (Alluvium)		25.3	5.0
1140.9	7.0		CH - FAT CLAY; high plasticity; very dark grayish brown slightly mottled with reddish brown; wet to very wet; stiff. (Alluvium)		29.2	7.5
1139.4	8.5		CL - LEAN CLAY; 5-10% fine sand; medium plasticity; grayish brown mottled with dark yellowish brown; wet to very wet; medium stiff to stiff. (Alluvium)		29	
1137.9	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

Figure C - 1

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206539.842; E 157311.886
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-02

SHEET 1 of 1

DATE: 3-17-2011

WATER LEVELS ∇ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1149.2	0.0		SP-SM - POORLY GRADED SAND with Silt; 0-5% fine gravel; 80-90% fine to coarse sand; nonplastic; light yellowish brown; moist to wet; loose. (Fill)		5.8	0.0
1147.2	2.0		CL - SANDY LEAN CLAY; 30-40% fine to coarse sand; medium plasticity; greenish gray with very dark grayish brown; wet to very wet; very soft to soft. (Fill)		29.4	2.5
1145.7	3.5		CL - LEAN CLAY; medium plasticity; black; very wet; medium stiff. (Alluvium)		34.7	
1144.2	5.0		CL/ML - SILTY CLAY; low to medium plasticity; dark gray mottled with dark brown and black; wet to very wet; soft to medium stiff. (Alluvium)		28.5	5.0
1142.2	7.0		CL/CH - LEAN TO FAT CLAY; 0-5% fine to coarse sand; medium to high plasticity; black slightly mottled with light gray; very wet; stiff. (Alluvium)		31.4	7.5
1139.2	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

Figure C - 2

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206539.845; E 157434.643
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-03

SHEET 1 of 1

DATE: 3-16-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1150.7	0.0		SM - SILTY SAND; 5-10% fine to coarse gravel; 60-70% fine to coarse sand; nonplastic; black; wet; medium dense; with cinders. (Fill)		16.9	0.0
1148.2	2.5		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; greenish gray; wet to very wet; medium stiff; with slight fuel odor. (Alluvium)		27.6	2.5
					29.2	5.0
						7.5
1142.7	8.0		CL - LEAN CLAY; medium plasticity; gray mottled with very dark grayish brown; very wet; medium stiff. (Alluvium)		35	
1140.7	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

Figure C - 3

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206421.813; E 157311.916
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-05

SHEET 1 of 1

DATE: 3-17-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1149.6	0.0		SM - SILTY SAND; 15-20% fine to coarse gravel; 60-70% fine to coarse sand; nonplastic; black; wet to very wet; loose to medium dense; with cinders and brick. (Fill)		30.4	0.0
						2.5
1146.1	3.5		CL - SANDY LEAN CLAY; 30-40% fine to medium sand; medium plasticity; yellowish brown with dark grayish brown; wet; soft to medium stiff. (Fill)		17.8	5.0
1143.6	6.0		CL/ML - SILTY CLAY; low to medium plasticity; grayish brown; wet to very wet; medium stiff. (Alluvium)		28.5	
1142.1	7.5		CH - FAT CLAY; high plasticity; black; wet to very wet; medium stiff to stiff. (Alluvium)		32.5	7.5
1139.6	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

Figure C - 4

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206421.728; E 157434.685
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-06

SHEET 1 of 1

DATE: 3-16-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1151.1	0.0		SM - SILTY SAND; 60-70% fine to coarse sand; nonplastic; black; moist to wet; loose; with cinders. (Fill)		18.2	0.0
1149.1	2.0		CL - LEAN CLAY; 10-15% fine to medium sand; medium plasticity; very dark grayish brown with greenish gray; wet to very wet; stiff. (Fill)		26.7	2.5
1148.1	3.0		CL - LEAN CLAY; medium plasticity; greenish gray mottled with black; wet to very wet; medium stiff. (Alluvium)		27.7	
1146.1	5.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet to very wet; medium stiff. (Alluvium)		35.5	5.0
1144.1	7.0		CL - LEAN CLAY; medium plasticity; black; wet to very wet; stiff. (Alluvium)		29.4	7.5
1141.1	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

Figure C - 5

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206285.506; E 157311.854
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-08

SHEET 1 of 1

DATE: 3-17-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1150.3	0.0		GM - SILTY GRAVEL with Sand; 60-70% fine to coarse gravel; 20-30% fine to coarse sand; nonplastic; grayish brown; moist; loose. (Fill)		4.1	0.0
1149.3	1.0		CL - SANDY LEAN CLAY; 0-5% fine to coarse gravel; 30-40% fine to coarse sand; medium plasticity; black; very wet; stiff. (Fill)		29.5	
1147.8	2.5		SM - SILTY SAND; 15-20% fine to coarse gravel; 60-70% fine to coarse sand; nonplastic; wet; loose to medium dense; with coal and cinders. (Fill)		17.2	2.5
1145.3	5.0		CL - LEAN CLAY; 0-10% fine sand; medium plasticity; dark gray with grayish brown; wet; soft to medium stiff. (Fill)		25.7	5.0
1143.3	7.0		CL - LEAN CLAY; medium plasticity; greenish gray slightly mottled with black; wet to very wet; soft. (Alluvium)		28.6	7.5
1141.8	8.5		CL - LEAN CLAY; medium plasticity; greenish gray slightly mottled with black heavily mottled with dark grayish brown; wet to very wet; medium stiff. (Alluvium)		33.8	
1140.3	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

Figure C - 6

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206285.566; E 157434.566
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-09

SHEET 1 of 1

DATE: 3-16-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1151.1	0.0		CINDERS; with 60-70% fine to coarse sand; with 10-15% fine to coarse gravel; black; wet to very wet; loose. (Fill)		29.8	0.0
1149.1	2.0		SM - SILTY SAND; 0-5% fine gravel; 65-75% fine to coarse sand; nonplastic; greenish gray; wet; loose; with moderate fuel odor. (Fill)		18.1	2.5
1148.3	2.8		CL - SANDY LEAN CLAY; 40-50% fine to medium sand; medium plasticity; greenish gray; wet; medium stiff; with moderate fuel odor. (Fill)			
1147.1	4.0		CL - LEAN CLAY; 10-15% fine to coarse sand; medium plasticity; dark grayish brown slightly mottled with red; wet; medium stiff; with brick and glass rubble. (Fill)		25.1	
1146.1	5.0		CL - LEAN CLAY; medium plasticity; dark greenish gray with dark grayish brown; wet to very wet; medium stiff. (Fill)		28.3	5.0
1144.1	7.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; very dark grayish brown slightly mottled with black; wet to very wet; medium stiff. (Alluvium)		32.4	7.5
1142.6	8.5		CH - FAT CLAY; high plasticity; black; wet to very wet; stiff. (Alluvium)		29.2	
1141.1	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

Figure C - 7

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206109.142; E 157088.162
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & SG

BORING LOG

BORING No.: SS2-10

SHEET 1 of 1

DATE: 3-24-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1149.5	0.0		SM - SILTY SAND; 70-80% fine to coarse sand; nonplastic; dark gray; moist; medium dense. (Fill)		6.2	0.0
1149.0	0.5		SM - SILTY SAND; 70-80% fine to coarse sand; nonplastic; yellowish brown with black; wet; medium dense. (Fill)		8.5	
1148.0	1.5		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; very dark brown; wet; soft to medium stiff. (Fill)		23.9	2.5
1146.5	3.0		CL/ML - SILTY CLAY; 0-5% fine sand; medium plasticity; gray; wet to very wet; stiff. (Alluvium)		29.2	
1145.0	4.5		CL - LEAN CLAY; medium plasticity; very dark brown; wet to very wet; stiff. (Alluvium)		30.5	5.0
1142.0	7.5		CL - LEAN CLAY; 0-5% fine gravel; 0-5% fine sand; medium plasticity; gray slightly mottled with yellowish red; wet to very wet; medium stiff. (Alluvium)		27.8	7.5
1139.5	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206153.834; E 157184.659
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-11

SHEET 1 of 1

DATE: 3-16-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1148.7	0.0		GM - SILTY GRAVEL with Sand; 10-20% fine to coarse gravel; 60-70% fine to coarse sand; nonplastic; grayish brown with white; moist to wet; loose. (Fill)		5.3	0.0
1146.7	2.0		CL - LEAN CLAY with Sand; 0-5% fine to coarse gravel; 15-20% fine to coarse sand; medium plasticity; greenish gray with dark yellowish brown; wet; stiff. (Fill)		19.9	2.5
1145.7	3.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; greenish gray slightly mottled with black; wet to very wet; medium stiff to stiff. (Alluvium)		28.9	
1143.7	5.0		ML - SILT; low plasticity; dark gray; wet to very wet; loose to medium dense. (Alluvium)		27.2	5.0
1142.7	6.0		CL/ML - SILTY CLAY; low to medium plasticity; dark gray with very dark grayish brown; wet to very wet; medium stiff. (Alluvium)		26.8	
1141.7	7.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; very dark gray slightly mottled with black and gray; wet; stiff. (Alluvium)		26.1	7.5
1140.2	8.5		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; dark grayish brown slightly mottled with black; wet to very wet; stiff. (Alluvium)		28.7	
1138.7	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

Figure C - 9

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206161.834; E 157295.902
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-12

SHEET 1 of 1

DATE: 3-17-2011

WATER LEVELS ▼ 8.0 IAD

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1150.6	0.0		CRUSHED LIMESTONE; 6" thick. (Fill)			0.0
1150.1	0.5		BURIED TIES; 30" thick. (Fill)			
						2.5
1147.6	3.0		CL - SANDY LEAN CLAY; 0-10% fine to coarse gravel; 20-30% fine to coarse sand; medium plasticity; dark greenish gray with black; wet; very soft to medium stiff; with wood pieces. (Fill)		26.5	
1145.6	5.0		CL - LEAN CLAY with Sand; 20-30% fine to medium sand; medium plasticity; greenish gray slightly mottled with black; very wet to saturated; very soft to soft. (Alluvium)			5.0
					21.2	7.5
1141.6	9.0		CL - LEAN CLAY with Sand; 20-30% fine to medium sand; medium plasticity; dark greenish gray heavily mottled with black; saturated; soft. (Alluvium)		36.4	
1140.6	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

Figure C - 10

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206173.834; E 157434.730
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-13

SHEET 1 of 1

DATE: 3-16-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1150.9	0.0		CINDERS; with 60-70% fine to coarse sand; with 10-15% fine to coarse gravel; black; moist; loose. (Fill)		29.3	0.0
1149.9	1.0		CL - LEAN CLAY; 10-15% fine to coarse sand; medium plasticity; greenish gray with dark yellowish brown and reddish brown; wet; medium stiff to stiff; with brick rubble. (Fill)		26.2	2.5
1147.9	3.0		CL/ML - SILTY CLAY; low to medium plasticity; greenish gray; wet to very wet; soft to medium stiff. (Fill)		34.6	
1145.9	5.0		CL - LEAN CLAY with Sand; 5-10% fine to coarse gravel; 10-20% fine to coarse sand; medium plasticity; greenish gray with white; wet; stiff. (Fill)		22.2	5.0
1143.9	7.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; black; wet to very wet; stiff. (Alluvium)		30.7	7.5
1140.9	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

Figure C - 11

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206036.359; E 157087.592
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & NC

BORING LOG

BORING No.: SS2-14

SHEET 1 of 1

DATE: 3-22-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1148.5	0.0		CL - SANDY LEAN CLAY; 0-5% fine gravel; 30-40% fine to coarse sand; medium plasticity; very dark gray; moist to wet; with a trace of brick rubble. (Fill)		14.3	0.0
1146.5	2.0		CL/CH - LEAN TO FAT CLAY; 0-10% fine to medium sand; medium to high plasticity; dark olive brown with very dark grayish brown mixed with dark yellowish brown; wet to very wet; medium stiff. (Fill)		28.2	2.5
1144.5	4.0		CL/ML - SILTY CLAY; low to medium plasticity; very dark grayish brown mottled with grayish brown; wet; stiff. (Alluvium)		24.5	
1143.5	5.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; black slightly mottled with light yellowish brown; wet to very wet; stiff; with few silt seams. (Alluvium)		30.9	5.0
1141.5	7.0		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; very dark grayish brown slightly mottled with dark yellowish brown; wet to very wet; stiff; with few silt seams. (Alluvium)		29.6	7.5
1140.5	8.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; olive brown mottled with dark yellowish brown slightly mottled with dark gray; wet to very wet; stiff. (Alluvium)		27	
1138.5	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206036.323; E 157184.672
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & NC

BORING LOG

BORING No.: SS2-15

SHEET 1 of 1

DATE: 3-18-2011

WATER LEVELS ∇ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1149.0	0.0		CL - SANDY LEAN CLAY; 0-5% fine to coarse gravel; 20-30% fine to coarse sand; medium plasticity; black; wet; stiff to very stiff. (Fill)			0.0
						2.5
					23	
1144.0	5.0		CL - LEAN CLAY with Sand; 15-20% fine to coarse sand; medium plasticity; olive gray; wet; very soft to medium stiff. (Alluvium)			5.0
					22.7	
1142.0	7.0		CL - LEAN CLAY with Sand; 15-20% fine to coarse sand; medium plasticity; olive gray; wet to saturated; soft. (Alluvium)			7.5
					33.1	
1140.0	9.0		CL - SILTY CLAY; 0-5% fine sand; low to medium plasticity; black; wet to saturated; soft. (Alluvium)			
					61	
1139.0	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

Figure C - 13

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206032.356; E 157311.829
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-16

SHEET 1 of 1

DATE: 3-17-2011

WATER LEVELS ∇ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1150.6	0.0		SP-SM - POORLY GRADED SAND with Silt; 10-15% fine to coarse gravel; 70-80% fine to coarse sand; nonplastic; pale brown with light gray; moist; loose. (Fill)		3.3	0.0
1149.6	1.0		CL - LEAN CLAY with Sand; 20-30% fine to coarse sand; medium plasticity; yellowish brown with dark olive brown and black; wet; medium stiff to stiff. (Fill)		19.7	2.5
1147.6	3.0		CINDERS; with 60-70% fine to coarse sand; with 15-20% fine to coarse gravel; black; very wet; loose. (Fill)		36.3	5.0
1145.1	5.5		CL - LEAN CLAY; medium plasticity; dark grayish brown slightly mottled with black; wet to very wet; medium stiff. (Alluvium)		31.3	
1144.1	6.5		CL/ML - SILTY CLAY; low to medium plasticity; light gray with dark grayish brown; wet to very wet; medium stiff. (Alluvium)		28	7.5
1143.1	7.5		CH - FAT CLAY; medium to high plasticity; black slightly mottled with light gray; wet to very wet; stiff. (Alluvium)		32.4	
1140.6	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 206049.356; E 157434.660
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-17

SHEET 1 of 1

DATE: 3-16-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1151.7	0.0		CINDERS; with 50-60% fine to coarse sand; with 10-20% fine to coarse gravel; black; moist; loose. (Fill)		24.4	0.0
1149.7	2.0		CL - LEAN CLAY; medium plasticity; olive brown with yellowish brown and dark grayish brown; wet to very wet; medium stiff. (Fill)		29.4	2.5
1148.7	3.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; very dark grayish brown; wet to very wet; soft to medium stiff. (Fill)		31.9	
1147.7	4.0		CL/ML - SILTY CLAY; low to medium plasticity; greenish gray; wet to very wet; medium stiff. (Alluvium)		28.7	
1146.7	5.0		CL/ML - SILTY CLAY; low to medium plasticity; dark greenish gray; wet to very wet; medium stiff. (Alluvium)		30.6	5.0 7.5
1143.7	8.0		CL/CH - LEAN TO FAT CLAY; 0-5% fine sand; medium to high plasticity; black slightly mottled with white; wet to very wet; stiff. (Alluvium)		31.8	
1141.7	10.0		Boring Terminated at: 10.0ft			10.0 12.5 15.0 17.5 20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205909.647; E 157087.024
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75HT / Straight Auger
CREW: CL & NC

BORING LOG

BORING No.: SS2-18

SHEET 1 of 1

DATE: 3-22-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1148.7	0.0		CL - LEAN CLAY; 0-5% fine gravel; 0-5% fine to coarse sand; medium plasticity; brown with yellowish red slightly mixed with light brown; moist; stiff. (Fill)		11.9	0.0
1146.2	2.5		CL/CH - LEAN TO FAT CLAY; 0-10% fine to medium sand; medium to high plasticity; dark brown with brown slightly mixed with yellowish brown and dark yellowish brown; wet; stiff. (Fill)		23.5	2.5
1144.7	4.0		CL - LEAN CLAY; 0-10% fine to medium sand; medium plasticity; very dark grayish brown slightly mixed with strong brown; wet; medium stiff. (Fill)		26.4	
1143.7	5.0		CL - LEAN CLAY; 0-5% fine to medium sand; medium plasticity; very dark gray slightly mottled with dark yellowish brown; wet to very wet; medium stiff. (Alluvium)		29.6	5.0 7.5
1138.7	10.0		Boring Terminated at: 10.0ft			10.0 12.5 15.0 17.5 20.0

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205929.593; E 157171.131
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & NC

BORING LOG

BORING No.: SS2-19

SHEET 1 of 1

DATE: 3-18-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1153.0	0.0		SM - SILTY SAND; 15-20% fine to coarse gravel; 60-70% fine to coarse sand; nonplastic; black; wet; medium dense; with cinders and brick. (Fill)		23.6	0.0
						2.5
1149.5	3.5		CL - SANDY LEAN CLAY; 30-40% fine to medium sand; medium plasticity; yellowish brown with olive gray; wet; medium stiff to stiff. (Fill)		22.2	5.0
1147.5	5.5		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; brown with dark brown; wet to very wet; soft to medium stiff. (Alluvium)		28.2	7.5
1145.0	8.0		CL/CH - LEAN TO FAT CLAY; 5-15% fine to coarse sand; medium to high plasticity; brown; wet; medium stiff. (Alluvium)		25.9	
1143.0	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205909.608; E 157311.821
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-20

SHEET 1 of 1

DATE: 3-17-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1150.2	0.0		ROCK SURFACING; 6" thick. (Fill)			0.0
1149.7	0.5		CINDERS; with 60-70% fine to coarse sand; with 15-20% fine to coarse gravel, coal and brick rubble; black; wet to very wet; medium dense to loose with depth. (Fill)		21.2	
						2.5
					26.6	
1145.7	4.5		CL - LEAN CLAY; medium plasticity; dark greenish gray with dark yellowish brown; wet to very wet; medium stiff. (Fill)			5.0
					30.7	
1143.2	7.0		ML - SILT; low plasticity; light gray with dark gray; wet to very wet; loose. (Alluvium)		27.7	7.5
1142.2	8.0		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; black slightly mottled with white; wet to very wet; stiff. (Alluvium)		31.3	
1140.2	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

Figure C - 18

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205909.589; E 157421.746
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-21

SHEET 1 of 1

DATE: 3-16-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1152.9	0.0		CINDERS; with 60-70% fine to coarse sand; with 15-20% fine to coarse gravel; black; moist; loose. (Fill)		21.4	0.0
1151.9	1.0		CL - SANDY LEAN CLAY; 5-15% fine to coarse gravel; 30-40% fine to coarse sand; medium plasticity; dark grayish brown with yellowish brown and red; wet to very wet; medium stiff; with brick rubble. (Fill)		27.2	2.5
1149.4	3.5		CL - LEAN CLAY; 5-10% fine to medium sand; medium plasticity; dark yellowish brown with olive brown; wet to very wet; medium stiff. (Fill)		28.5	
1147.9	5.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark grayish brown with greenish gray; wet to very wet; medium stiff. (Alluvium)		30.6	5.0
1145.4	7.5		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; black; wet to very wet; stiff. (Alluvium)		32.6	7.5
1142.9	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205788.800; E 157086.424
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & NC

BORING LOG

BORING No.: SS2-22

SHEET 1 of 1

DATE: 3-18-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1149.0	0.0		CINDERS; 15-20% fine to coarse gravel; 60-70% fine to coarse sand; nonplastic; black; wet to very wet; loose. (Fill)		22.4	0.0
1148.0	1.0		SM - SILTY SAND; 10-20% fine to coarse gravel; 45-55% fine to coarse sand; nonplastic; light brown; wet; loose to medium dense. (Fill)		13	2.5
1146.0	3.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; brown with black; wet to very wet; soft to medium stiff. (Fill)		28.7	
1144.0	5.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; dark gray mottled with gray; wet to very wet; medium stiff; with silt seams. (Alluvium)		35.7	5.0
1141.5	7.5		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; dark gray mottled with gray; wet to very wet; soft to medium stiff. (Alluvium)		29.2	7.5
1139.0	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

Figure C - 20

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205788.759; E 157177.631
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & NC

BORING LOG

BORING No.: SS2-23

SHEET 1 of 1

DATE: 3-18-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1149.0	0.0		SM - SILTY SAND; 15-20% fine to coarse gravel; 60-70% fine to coarse sand; nonplastic; black; wet to very wet; loose to medium dense; with cinders and brick. (Fill)			0.0
						2.5
					25.5	
1144.0	5.0		CL - LEAN CLAY with Sand; 0-5% fine gravel; 20-30% fine to coarse sand; medium plasticity; yellowish brown mottled with brown; wet; medium stiff to stiff. (Fill)			5.0
					19.9	
1142.0	7.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; black mottled with gray; wet to very wet; medium stiff. (Alluvium)			7.5
					30	
1140.5	8.5		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; dark gray mottled with black; wet to very wet; medium stiff. (Alluvium)			
					27.1	
1139.0	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205768.759; E 157299.829
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-24

SHEET 1 of 1

DATE: 3-17-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1150.4	0.0		BALLAST; 6" thick. (Fill)			0.0
1149.9	0.5		CINDERS; with 50-60% fine to coarse sand; with 15-20% fine to coarse gravel and brick rubble; black; wet to very wet; loose; with few clay seams. (Fill)		26.2	2.5
					25.1	5.0
1144.9	5.5		CL - SANDY LEAN CLAY; 40-50% fine to coarse sand; medium plasticity; dark yellowish brown with grayish brown; wet; medium stiff to stiff. (Fill)		23.5	7.5
1142.4	8.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; olive brown with very dark grayish brown; wet; medium stiff. (Fill)		19.9	
1140.4	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

Figure C - 22

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PROJECT: South "Hole-in-the-Donut" Soil Survey
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LOCATION: N 205788.771; E 157434.614
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-25

SHEET 1 of 1

DATE: 3-16-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1151.5	0.0		CINDERS; with 60-70% fine to coarse sand; with 10-15% fine to coarse gravel; black; wet to very wet; loose to medium dense. (Fill)		24.2	0.0 2.5
1148.0	3.5		CL - LEAN CLAY; medium plasticity; greenish gray mottled with very dark grayish brown; wet to very wet; stiff. (Fill)		30.9	
1146.5	5.0		CL - SANDY LEAN CLAY; 15-25% fine to coarse gravel; 20-30% fine to coarse sand; medium plasticity; red; wet to very wet; medium stiff; brick rubble. (Fill)		32.9	5.0
1145.0	6.5		CL - LEAN CLAY with Sand; 5-15% fine to coarse gravel; 15-20% fine to coarse sand; medium plasticity; wet; stiff. (Fill)		26.5	7.5
1143.0	8.5		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; black; wet to very wet; stiff. (Alluvium)		28.2	
1141.5	10.0		Boring Terminated at: 10.0ft			10.0 12.5 15.0 17.5 20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205667.954; E 157082.931
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & NC

BORING LOG

BORING No.: SS2-26

SHEET 1 of 1

DATE: 3-18-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1148.9	0.0		CL - LEAN CLAY with Gravel; 10-20% fine to coarse gravel; 5-15% fine to coarse sand; medium plasticity; brown with dark brown; wet; stiff. (Fill)		6.9	0.0
1147.9	1.0		CL - GRAVELLY LEAN CLAY; 25-35% fine to coarse gravel; 5-15% fine to coarse sand; medium plasticity; grayish brown; moist to wet; medium stiff to stiff. (Fill)		11.8	2.5
1145.4	3.5		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; brown; wet to very wet; soft to medium stiff. (Alluvium)		28.7	
1143.9	5.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; dark gray mottled with gray; wet to very wet; soft; with silt seams. (Alluvium)		37.8	5.0
1140.9	8.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; dark gray mottled with gray; wet to very wet; soft. (Alluvium)		30.7	7.5
1138.9	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205668.013; E 157175.631
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & NC

BORING LOG

BORING No.: SS2-27

SHEET 1 of 1

DATE: 3-18-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1149.9	0.0		SC - CLAYEY SAND with Gravel; 15-25% fine gravel; 30-40% fine to coarse sand; black; wet; medium dense. (Fill)		16	0.0
						2.5
1146.4	3.5		SM - SILTY SAND with Gravel; 15-25% fine gravel; 50-60% fine to coarse sand; nonplastic; light brown; wet; loose to medium dense. (Fill)		9.7	
1144.9	5.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; gray mottled with dark gray and light gray; wet; medium stiff. (Alluvium)		26.5	5.0
						7.5
1141.9	8.0		CL/CH - LEAN TO FAT CLAY; 0-5% fine sand; medium to high plasticity; dark gray; wet to very wet; medium stiff. (Alluvium)		30.2	
1139.9	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

Figure C - 25

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205668.071; E 157311.922
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-28

SHEET 1 of 1

DATE: 3-17-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1150.6	0.0		CINDERS; with 50-60% fine to coarse sand; with 15-20% fine to coarse gravel; black; wet to very wet; loose; with clay seams. (Fill)		31.2	0.0
					24.5	2.5
						5.0
1144.1	6.5		CL - SANDY LEAN CLAY; 40-50% fine to medium sand; medium plasticity; yellowish brown with greenish gray; wet; medium stiff. (Fill)		19.2	7.5
1142.1	8.5		CL/CH - LEAN TO FAT CLAY; 0-5% fine sand; medium to high plasticity; black; wet; medium stiff. (Alluvium)		26.3	
1140.6	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

Figure C - 26

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205667.932; E 157434.577
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-29

SHEET 1 of 1

DATE: 3-16-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1151.4	0.0		CINDERS; with 60-70% fine to coarse sand; with 5-15% fine to coarse gravel; black; wet to very wet; loose. (Fill)		24.4	0.0
1148.4	3.0		CL - LEAN CLAY; 0-10% fine to coarse sand; medium plasticity; yellowish brown with greenish gray and dark grayish brown; wet to very wet; medium stiff to stiff. (Fill)		28	2.5
1144.9	6.5		CL/ML - SILTY CLAY; low to medium plasticity; light gray with dark grayish brown; wet to very wet; medium stiff. (Alluvium)		29.7	5.0
1143.9	7.5		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; black; wet; medium stiff. (Alluvium)		26.7	7.5
1141.4	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205538.610; E 157085.304
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & NC

BORING LOG

BORING No.: SS2-30

SHEET 1 of 1

DATE: 3-18-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1149.1	0.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; black; wet; stiff. (Fill)		19.5	0.0
1148.1	1.0		CL - SANDY LEAN CLAY; 30-35% fine to coarse sand; medium plasticity; brown with light brown; wet; medium stiff. (Fill)		21.9	2.5
1146.1	3.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; light brown with gray; wet; medium stiff to stiff. (Fill)		23.6	5.0
1143.6	5.5		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; dark gray mottled with gray; wet to very wet; medium stiff. (Alluvium)		28.6	7.5
1141.6	7.5		CL/CH - LEAN TO FAT CLAY; 0-5% fine sand; medium to high plasticity; black; wet to very wet; medium stiff. (Alluvium)		28.6	10.0
1139.1	10.0		Boring Terminated at: 10.0ft			12.5
						15.0
						17.5
						20.0

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205538.588; E 157203.631
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & NC

BORING LOG

BORING No.: SS2-31

SHEET 1 of 1

DATE: 3-18-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1149.9	0.0		SM - SILTY SAND; 15-20% fine to coarse gravel; 60-70% fine to coarse sand; nonplastic; black; wet to very wet; loose; with cinders and brick. (Fill)		23.7	0.0
1148.9	1.0		CL - LEAN CLAY with Sand; 0-5% fine gravel; 20-30% fine to coarse sand; medium plasticity; brown with light brown and black; wet; medium stiff to stiff. (Fill)		26	2.5
1145.9	4.0		CL - LEAN CLAY; 0-5% fine gravel; 0-5% fine sand; medium plasticity; black; wet; stiff. (Fill)		21.2	
1144.9	5.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; dark gray mottled with gray; wet to very wet; medium stiff. (Alluvium)		30	5.0 7.5
1141.9	8.0		CL/CH - LEAN TO FAT CLAY; 0-5% fine sand; medium to high plasticity; very dark gray; wet to very wet; medium stiff. (Alluvium)		31.9	
1139.9	10.0		Boring Terminated at: 10.0ft			10.0 12.5 15.0 17.5 20.0

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205538.689; E 157311.800
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-32

SHEET 1 of 1

DATE: 3-17-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1150.9	0.0		CINDERS; with 50-60% fine to coarse sand; with 15-20% fine to coarse gravel; black with red; wet to very wet; loose; with a trace of brick rubble. (Fill)		27.1	0.0
1148.9	2.0		CL - SANDY LEAN CLAY; 10-15% fine to coarse gravel; 30-40% fine to coarse sand; medium plasticity; black with yellowish brown and reddish brown; wet; medium stiff to stiff. (Fill)		20.2	2.5
1147.4	3.5		CINDERS; with 50-60% fine to coarse sand; with 15-20% fine to coarse gravel; black with red; wet; loose; with a trace of brick rubble. (Fill)		19	5.0
1144.9	6.0		CL - SANDY LEAN CLAY; 0-10% fine to coarse gravel; 35-45% fine to coarse sand; medium plasticity; dark yellowish brown with white; wet; medium stiff. (Fill)		19.9	
1143.9	7.0		CL/ML - SILTY CLAY; low to medium plasticity; very dark grayish brown slightly mottled with dark gray; wet to very wet; medium stiff. (Alluvium)		29.8	7.5
1141.9	9.0		CL/CH - LEAN TO FAT CLAY; 0-5% fine sand; medium to high plasticity; black slightly mottled with dark grayish brown; wet to very wet; medium stiff. (Alluvium)		31.8	
1140.9	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205538.564; E 157434.627
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-33

SHEET 1 of 1

DATE: 3-16-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1151.5	0.0		CINDERS; with 60-70% fine to coarse sand; 10-15% fine to coarse gravel; black; wet to very wet; loose to medium dense. (Fill)		35.5	0.0
1149.5	2.0		CL - LEAN CLAY; medium plasticity; yellowish brown with dark grayish brown; wet to very wet; medium stiff. (Fill)		28.9	2.5
1148.0	3.5		CL - LEAN CLAY; 0-10% fine sand; medium plasticity; greenish gray with dark grayish brown; wet; soft to medium stiff. (Fill)		24	5.0
1145.5	6.0		CL - LEAN CLAY; medium plasticity; dark greenish gray slightly mottled with black; wet to very wet; medium stiff. (Alluvium)		29	
1144.0	7.5		ML - SILT; low plasticity; light gray with dark grayish brown; wet to very wet; loose. (Alluvium)		30.1	7.5
1143.5	8.0		CL/CH - LEAN TO FAT CLAY; 0-5% fine sand; medium to high plasticity; black; wet; stiff. (Alluvium)		25.3	
1141.5	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205422.442; E 157072.561
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & NC

BORING LOG

BORING No.: SS2-34

SHEET 1 of 1

DATE: 3-18-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1150.1	0.0		CL - LEAN CLAY with Sand; 5-15% fine to coarse gravel; 10-20% fine to coarse sand; medium plasticity; brown; wet; stiff. (Fill)		17.2	0.0
1147.1	3.0		SM - SILTY SAND; 15-25% fine to coarse gravel; 55-65% fine to coarse sand; nonplastic; light brown; wet; loose. (Fill)		8.2	2.5
1145.1	5.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; brown; wet; soft to medium stiff. (Fill)		26.3	5.0
1143.1	7.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; very dark gray mottled with gray; wet to very wet; very soft to soft. (Alluvium)		29.1	7.5
1141.1	9.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; black; wet to very wet; soft. (Alluvium)		32.8	
1140.1	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

Figure C - 32

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205418.810; E 157192.631
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & NC

BORING LOG

BORING No.: SS2-35

SHEET 1 of 1

DATE: 3-18-2011

WATER LEVELS ▽ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1150.1	0.0		SM - SILTY SAND; 5-10% fine to coarse gravel; 70-80% fine to coarse sand; nonplastic; brown; wet; loose. (Fill)		10.2	0.0
1149.1	1.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; brown with light brown; wet; medium stiff to stiff. (Fill)		18.8	2.5
1145.1	5.0		SM - SILTY SAND; 75-85% fine to coarse sand; nonplastic; brown; wet; loose; with pieces of wood. (Fill)		21.6	5.0
1144.1	6.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; very dark gray mottled with gray; wet to very wet; medium stiff. (Alluvium)		29.5	7.5
1140.1	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205418.419; E 157311.817
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-36

SHEET 1 of 1

DATE: 3-17-2011

WATER LEVELS ∇ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1150.8	0.0		CINDERS; with 50-60% fine to coarse sand; with 0-10% fine to coarse gravel; black; moist; loose. (Fill)		15.7	0.0
1148.8	2.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark yellowish brown with very dark grayish brown; wet; medium stiff to stiff. (Fill)		24.4	2.5
1146.8	4.0		LEAN CLAY; Same as above except medium stiff. (Fill)		20.8	5.0
1144.8	6.0		CL/ML - SILTY CLAY; low to medium plasticity; light gray with dark grayish brown; wet to very wet; medium stiff. (Alluvium)		27.4	
1143.3	7.5		CL/CH - LEAN TO FAT CLAY; 0-5% fine to medium sand; medium to high plasticity; black slightly mottled with dark grayish brown; wet; medium stiff. (Alluvium)		25.3	7.5
1140.8	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

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PROJECT: South "Hole-in-the-Donut" Soil Survey
West Haymarket Project

LOCATION: N 205431.442; E 157434.649
Lincoln, Nebraska

JOB NO.: 00110208.00
RIG / METHOD: CME 75 / Straight Auger
CREW: PN & LDI

BORING LOG

BORING No.: SS2-37

SHEET 1 of 1

DATE: 3-16-2011

WATER LEVELS ∇ No groundwater was encountered to depth of boring

ELEV (NAVD88)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	MOISTURE (%)	DEPTH (feet)
1151.3	0.0		BALLAST; 6" thick. (Fill)			0.0
1150.8	0.5		CINDERS; with 60-70% fine to coarse sand; with 10-15% fine to coarse gravel; black; moist; loose. (Fill)		21.4	
1149.3	2.0		CL - LEAN CLAY; medium plasticity; yellowish brown with black and white; wet; medium stiff. (Fill)		21.9	2.5
1148.3	3.0		CL - SANDY LEAN CLAY; 40-50% fine to medium sand; medium plasticity; grayish brown with dark yellowish brown; wet; medium stiff. (Fill)		17.5	
1147.3	4.0		CL - LEAN CLAY; 10-15% fine to medium sand; medium plasticity; dark grayish brown with dark olive brown; wet; medium stiff. (Fill)		24	
1146.3	5.0		CL - LEAN CLAY; Same as above except wet to very wet. (Fill)		35.1	5.0
1144.8	6.5		CL - LEAN CLAY; medium plasticity; very dark grayish brown slightly mottled with black; wet; medium stiff to stiff. (Alluvium)		26.7	7.5
1142.8	8.5		CL/CH - LEAN TO FAT CLAY; 0-5% fine sand; medium to high plasticity; very dark grayish brown slightly mottled with white and reddish brown; wet; stiff. (Alluvium)		21.1	
1141.3	10.0		Boring Terminated at: 10.0ft			10.0
						12.5
						15.0
						17.5
						20.0

BORING LOG NRD SOIL SURVEY SOUTH BORING LOGS.GPJ HWS.GDT 4/8/11

APPENDIX D. CRITERIA USED FOR SOIL CLASSIFICATION

USCS SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LESS THAN 5% FINES)		GW	WELL-GRADED GRAVEL
				GP	POORLY-GRADED GRAVEL
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (MORE THAN 12% FINES)		GM	SILTY GRAVEL (LOW PLASTIC FINES)
				GC	CLAYEY GRAVEL (MEDIUM TO HIGH PLASTIC FINES)
MORE THAN 50% OF MATERIALS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LESS THAN 5% FINES)		SW	WELL-GRADED SAND
				SP	POORLY-GRADED SAND
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (MORE THAN 12% FINES)		SM	SILTY SAND (LOW PLASTIC FINES)
				SC	CLAYEY SAND (MEDIUM TO HIGH PLASTIC FINES)
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	SILT (0-15% SAND) SILT WITH SAND (15-30% SAND) SANDY SILT (30-50% SAND)
				CL	LEAN CLAY (0-15% SAND) LEAN CLAY WITH SAND (15-30% SAND) SANDY LEAN CLAY (30-50% SAND)
				OL	ORGANIC SILTS AND LEAN CLAYS
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	ELASTIC SILT (0-15% SAND) ELASTIC SILT WITH SAND (15-30% SAND) SANDY ELASTIC SILT (30-50% SAND)
				CH	FAT CLAY (0-15% SAND) FAT CLAY WITH SAND (15-30% SAND) SANDY FAT CLAY (30-50% SAND)
				OH	ORGANIC ELASTIC SILTS AND FAT CLAYS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

GENERAL NOTES

CRITERIA FOR DESCRIBING CLAY SOILS

MOISTURE CONDITION

Description	Criteria
Dry	Absence of moisture, dusty, dry to touch.
Moist	Damp, slightly wet, moisture content below plastic limit.
Wet	Moisture content above the plastic limit.
Saturated	Very wet. Usually soils is below the water table.

CONSISTENCY

Description	Penetration Resistance, N_{60} (blows/ft)[1]
Very Soft	Less than 3
Soft	3 to 4
Medium Stiff	5 to 8
Stiff	9 to 16
Very Stiff	16 to 32
Hard	Greater than 32

CRITERIA FOR DESCRIBING GRANULAR SOILS

MOISTURE CONDITION

Description	Criteria
Dry	Absence of moisture, dry to the touch.
Moist	Damp but no visible free water.
Wet	Visible free water.
Saturated	Usually soil is below water table.

DENSITY

Description	Penetration Resistance, N_{60} (blows/ft)[1]
Very Loose	Less than 5
Loose	5 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	Greater than 50

CRITERIA FOR DESCRIBING ROCK

STRENGTH/HARDNESS

Description	Criteria
Very Soft	Permits denting by moderate pressure of the fingers.
Soft	Resists denting by the fingers, but can be abraded and pierced to a shallow depth by a pencil point.
Moderately Soft	Resists a pencil point, but can be scratched and cut with a knife blade.
Moderately Hard	Resistant to abrasion or cutting by a knife blade, but can be easily dented or broken by light blows of a hammer.
Hard	Can be deformed or broken by repeated moderate hammer blows.
Very Hard	Can be broken only by heavy, and in some rocks, repeated hammer blows.

[1]Blow counts shown on the boring logs are those recorded directly in the field and have not been corrected for hammer efficiency. The boring log blow counts must be corrected to an equivalent hammer efficiency of 60% in order to use the criteria in this table.

APPENDIX E. MOISTURE-DENSITY CURVES

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Soil Compaction Curve
STANDARD COMPACTIVE EFFORT
ASTM Designation: D 698

Job No.: 00110208.00 Lab No. 29628 Curve No. 5894 Date 31-Mar-11

Project: South "Hole-in-the-Donut" Soil Survey; West Haymarket Project

Location: Composite Sample

Material: Alluvium 8.0'-10.0'

Classification	CH	Total Percent Retained On:	
Liquid Limit	54	No. 4 Sieve	
Plastic Limit	19	3/8-in. Sieve	
Plasticity Index	35	3/4-in. Sieve	
Specific Gravity		Oversize Fraction	%

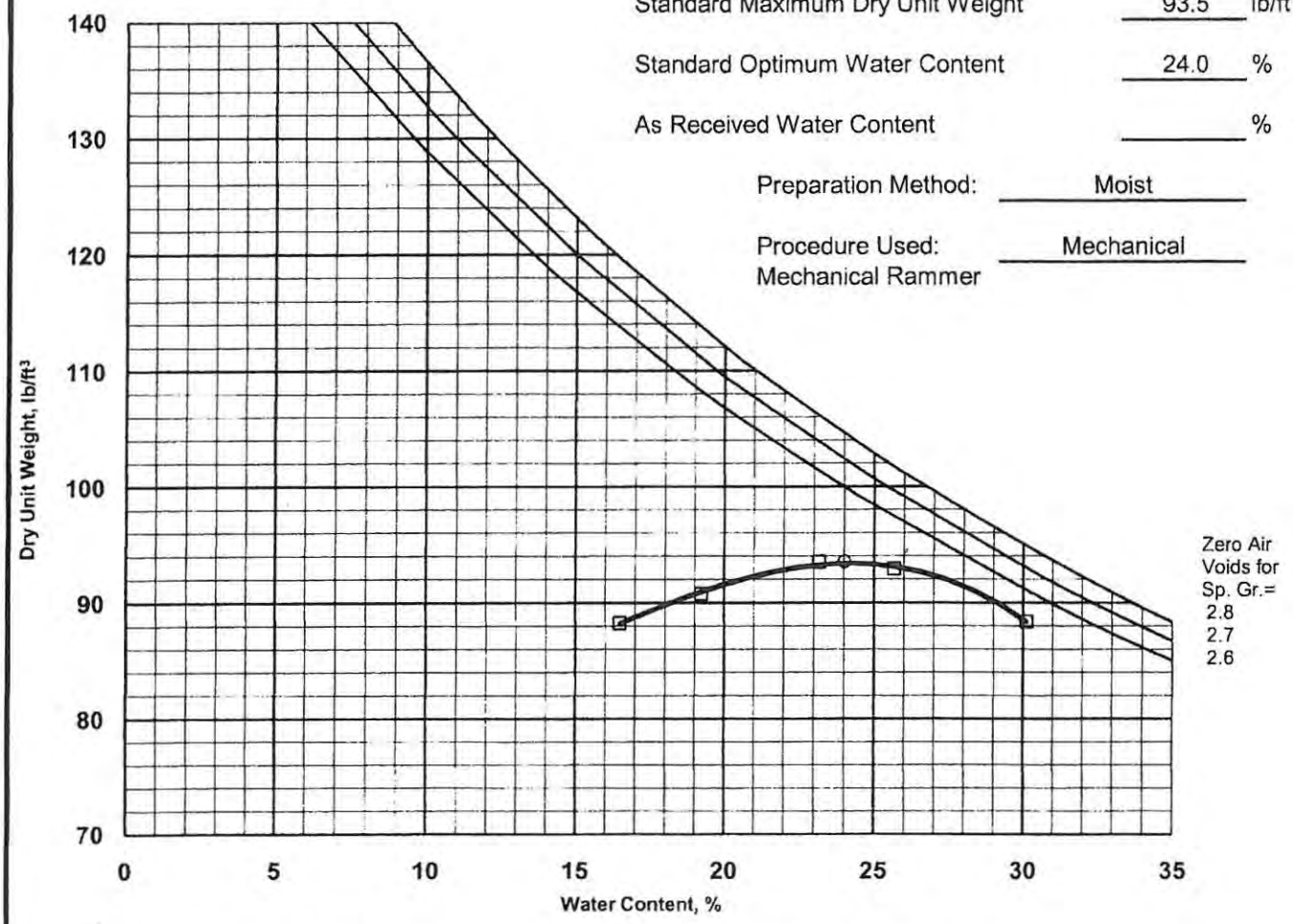
Standard Maximum Dry Unit Weight 93.5 lb/ft^3

Standard Optimum Water Content 24.0 %

As Received Water Content %

Preparation Method: Moist

Procedure Used: Mechanical
Mechanical Rammer



□ Laboratory test points ○ Computed Max. Dry Unit Weight and Optimum water content

Figure E-1

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Soil Compaction Curve
STANDARD COMPACTIVE EFFORT
ASTM Designation: D 698

Job No.: 00110208.00 Lab No. 29629 Curve No. 5895 Date 31-Mar-11

Project: South "Hole-in-the-Donut" Soil Survey; West Haymarket Project

Location: Composite Sample

Material: Existing Fill 2.0'-5.0'

Classification	CH	Total Percent Retained On:	
Liquid Limit	52	No. 4 Sieve	
Plastic Limit	19	3/8-in. Sieve	
Plasticity Index	33	3/4-in. Sieve	
Specific Gravity		Oversize Fraction	%

Standard Maximum Dry Unit Weight 97.5 lb/ft^3

Standard Optimum Water Content 22.5 %

As Received Water Content %

Preparation Method: Moist

Procedure Used: Mechanical
Mechanical Rammer

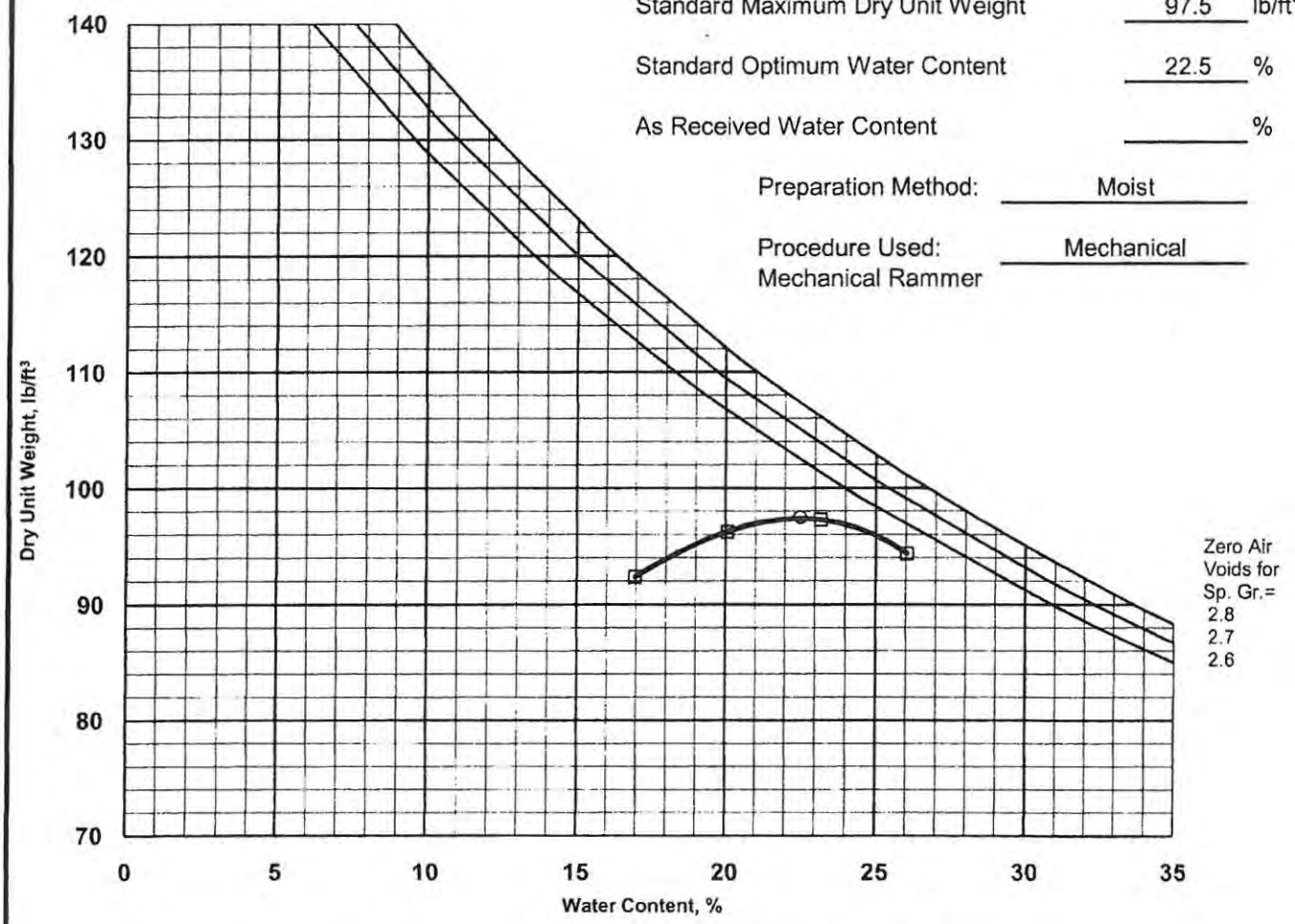

Figure E-2

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Soil Compaction Curve
STANDARD COMPACTIVE EFFORT
ASTM Designation: D 698

Job No.: 00110208.00 Lab No. 29631 Curve No. 5896 Date 31-Mar-11

Project: South "Hole-in-the-Donut" Soil Survey; West Haymarket Project

Location: Composite Sample

Material: Alluvium 4.0'-7.0'

Classification	CL	Total Percent Retained On:	
Liquid Limit	47	No. 4 Sieve	
Plastic Limit	18	3/8-in. Sieve	
Plasticity Index	29	3/4-in. Sieve	
Specific Gravity		Oversize Fraction	%

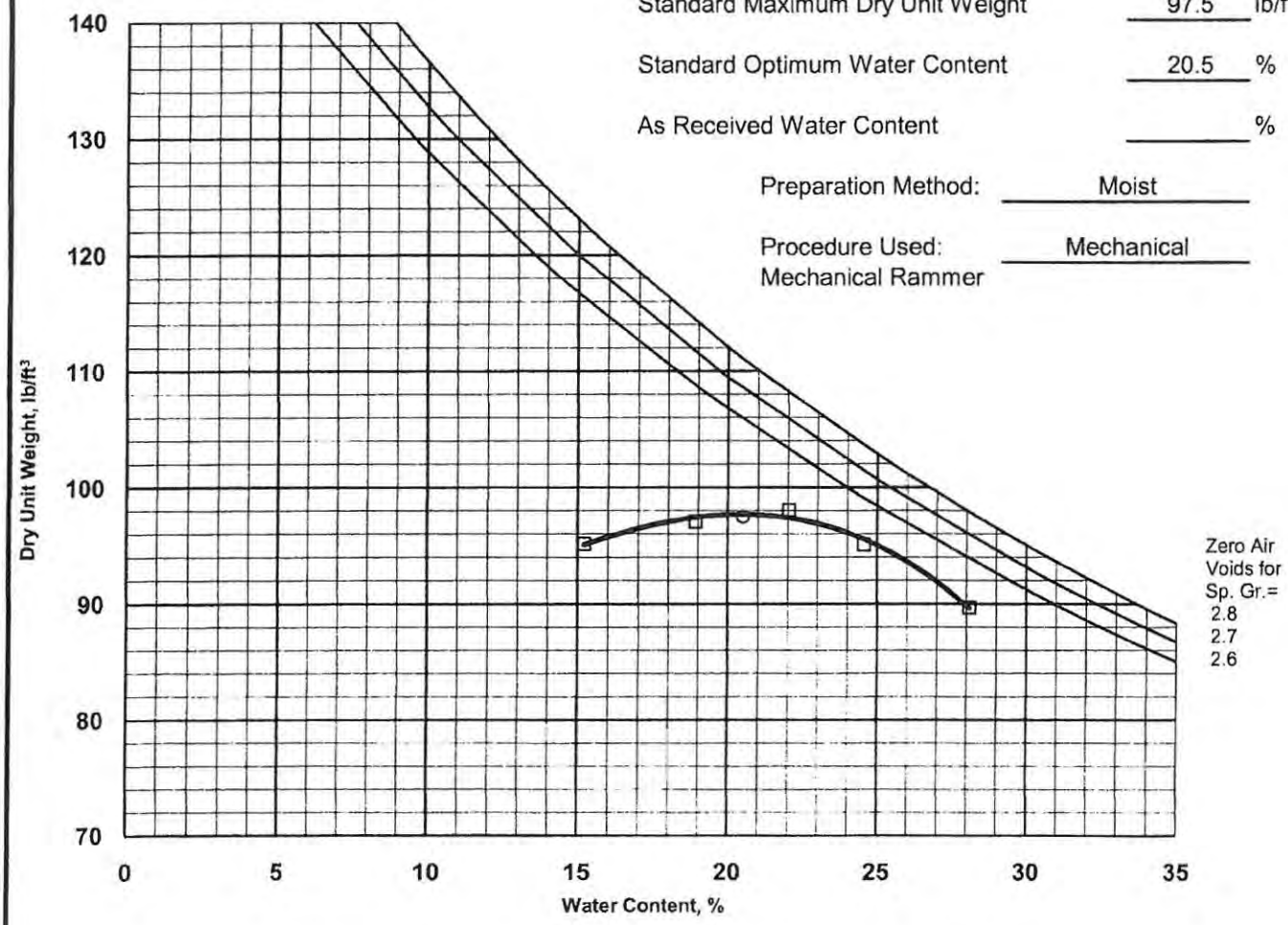
Standard Maximum Dry Unit Weight 97.5 lb/ft^3

Standard Optimum Water Content 20.5 %

As Received Water Content %

Preparation Method: Moist

Procedure Used: Mechanical
Mechanical Rammer



□ Laboratory test points ○ Computed Max. Dry Unit Weight and Optimum water content

Figure E-3

COORDINATE TABLE				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	848868.588	785904.706	1152.5	LIMITS OF GRADING
2	849726.084	785891.209	1154.0	LIMITS OF GRADING
3	850382.479	785880.828	1156.0	LIMITS OF GRADING
4	850389.749	785880.693	1159.0	LIMITS OF GRADING
5	850541.128	785877.135	1159.0	LIMITS OF GRADING
6	850458.957	785867.030	1159.0	LIMITS OF GRADING
7	852351.727	785835.171	1158.0	LIMITS OF GRADING
8	852710.521	785823.096	1154.0	LIMITS OF GRADING
9	853094.705	785807.750	1152.0	LIMITS OF GRADING
10	853526.481	785771.848	1150.0	LIMITS OF GRADING
11	853807.570	785630.887	1150.0	CREST OF COMPACTED FILL
12	853716.290	785467.344	1152.0	CREST OF COMPACTED FILL
13	853339.059	785423.485	1154.0	CREST OF COMPACTED FILL
14	853330.646	785337.718	1158.0	CREST OF COMPACTED FILL
15	853298.244	785303.740	1159.0	CREST OF COMPACTED FILL
16	853217.270	785275.716	1159.0	CREST OF COMPACTED FILL
17	849216.447	785225.241	1154.0	CREST OF COMPACTED FILL
18	848716.871	785177.771	1152.0	CREST OF COMPACTED FILL
19	848622.622	785126.596	1151.0	CREST OF COMPACTED FILL
20	848609.753	785092.342	1151.0	CREST OF COMPACTED FILL

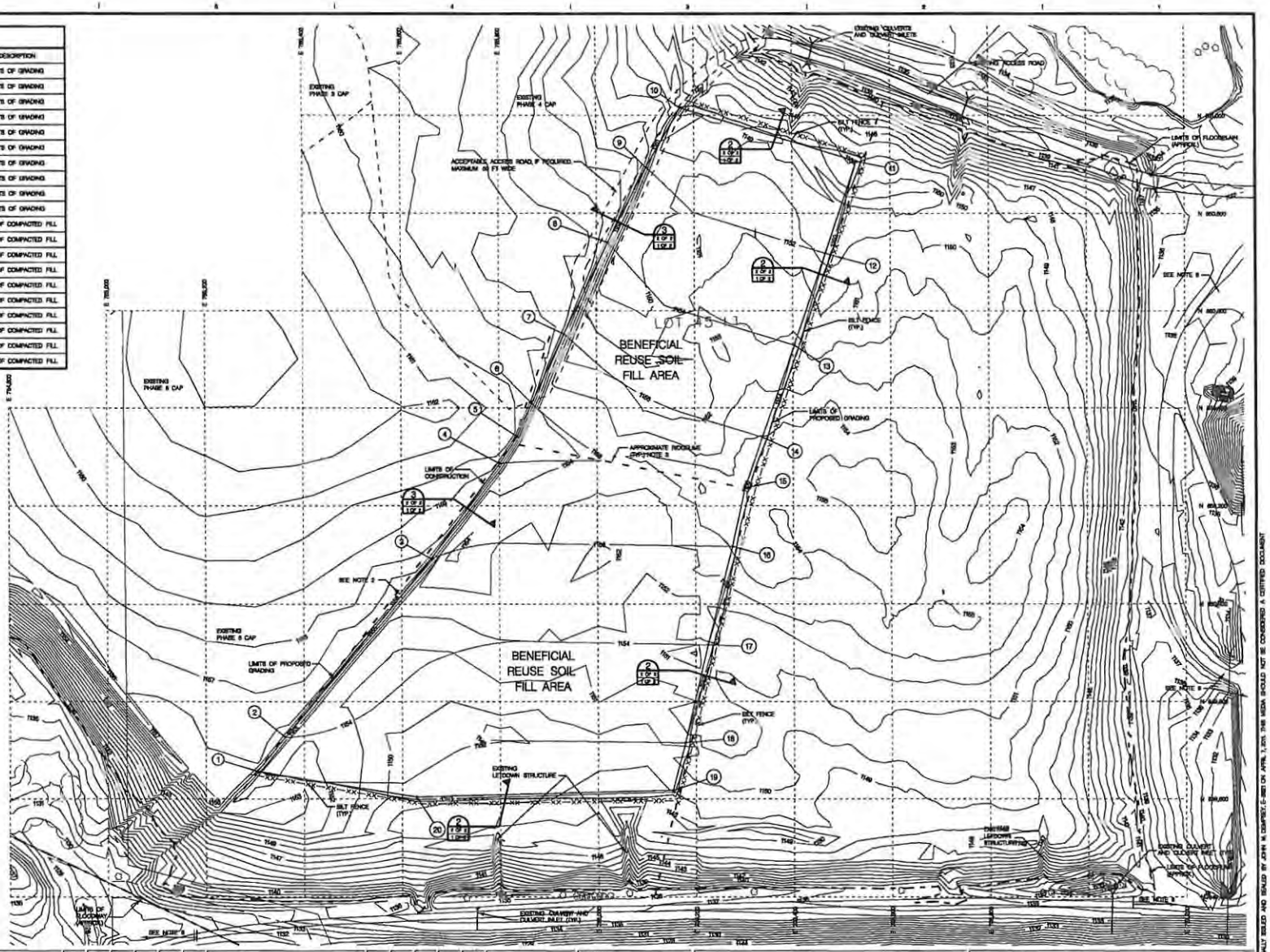
N

SCALE

0 100 200 300

NOTES:

1. SEE SPECIFICATION ON BENEFICIAL SOIL AND CONSTRUCTION AND DEMOLITION WASTE MATERIAL REQUIREMENTS FOR ADDITIONAL INFORMATION.
2. MATCH GRADES FOR BENEFICIAL REUSE SOIL TO BE 2 FEET MINIMUM LOWER THAN EXISTING GRADES IN PHASE 1 AND 2 CAPPING AREAS.
3. CITY MAY DIRECT FILLING PRIORITY NORTH OR SOUTH OF ROSELINE.
4. AVOID CROSS CONTAMINATION OF THE EXISTING PHASE 4 AND 5 AREA CAPS. DO NOT TRACK, OR MOVE SOILS FROM THE PROPOSED FILL FOR BENEFICIAL SOIL REUSE ACROSS THESE AREAS.
5. PROTECT EXISTING GRASSING, VEGETATION, AND EROSION CONTROLS.
6. LIMIT ACTIVITY IN FLOODPLAIN TO THE GREATEST EXTENT POSSIBLE. NO ACTIVITY PERMITTED IN FLOODWAY.
7. ALTERNATE ACCESS ROADS TO BENEFICIAL SOIL REUSE AREA SUBJECT TO CITY APPROVAL.
8. USE OF EXISTING PERIMETER ROAD IN THESE AREAS IS PROHIBITED WITHOUT CITY'S WRITTEN APPROVAL.
9. BACKGROUND TOPOGRAPHY FROM HWS CONSULTING GROUP (3/26/2008)
10. SOILS CONTAINING LEAD ARSENIC AND PETROLEUM HYDROCARBONS AND SIMILAR CONTAMINANTS SHALL NOT BE USED FOR POND MAINTENANCE OR PLACED OUTSIDE BENEFICIAL REUSE SOIL FILL AREAS.
11. SITE COORDINATES ARE BASED UPON MODIFIED STATE PLANE COORDINATE SYSTEM. ELEVATIONS ARE AMSL. ADDITIONAL SURVEY CONTROL DATA IS AVAILABLE FROM CITY OF LINCOLN.



HDR

HDR Engineering, Inc.

1	[illegible]	4/11	

Project Manager: J. DEMPSEY

Drawn By: R. BELL

City of Lincoln, Nebraska
North 48th Street
Beneficial Fill Grading Plan

GRADING PLAN & CONTROL

PROJECT #[illegible] / BENEFICIAL FILL ASSOCIATED WITH JPA PROJECT #[illegible] / INITIAL SITE PREPARATION FOR WEST HAYMARKET INFRASTRUCTURE IMPROVEMENTS

Date: APRIL 2011	Project No.: [illegible]	Drawing No.: 1 of 2	Issue: 1
Scale: AS NOTED	File Name: SHEET01.DWG		

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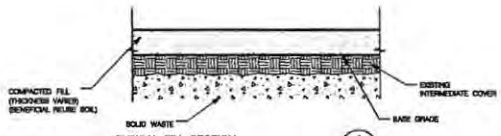
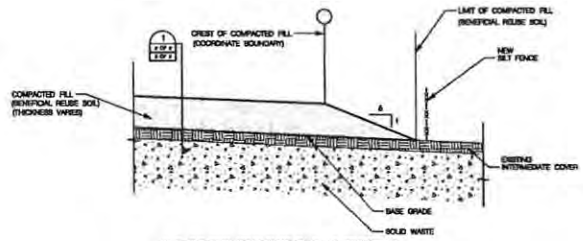
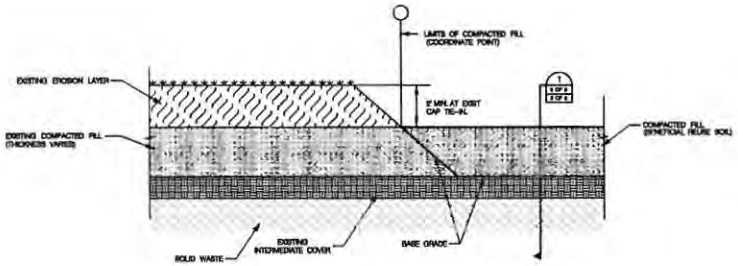


TYPICAL FILL SECTION
NO SCALE
1
2 OF 2
2 OF 2

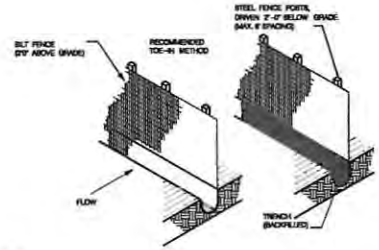


NOTE: THIS DETAIL APPLIES WHERE FILL SOIL IS TERMINATED AT INTERMEDIATE LOCATIONS.

COMPACTED FILL TERMINATION DETAIL
NO SCALE
2
3 OF 3
1 OF 3



EXISTING CAP CONNECTION DETAIL
NO SCALE
3
2 OF 3
1 OF 3



NOTES:
1. SEE SPECIFICATIONS FOR MINIMUM REQUIREMENTS FOR INSTALLATION AND MAINTENANCE.

SILT FENCE DETAIL
NO SCALE
4
2 OF 3
2 OF 3

HDR Engineering, Inc.

Issue No.	Description	Date	Issue No.	Description	Date
1	ISSUED	4/11			

Project Manager: J. DEMPSEY
Checked: R. BELL
Project Engineer:

City of Lincoln, Nebraska
North 48th Street
Beneficial Fill Grading Plan

GRADING AND CONTROL DETAILS

PROJECT #70482 / BENEFICIAL FILL ASSOCIATED WITH JPA, PROJECT #87703 / INITIAL SITE PREPARATION FOR WEST HAYMARKET INFRASTRUCTURE IMPROVEMENTS

Date: APRIL 2011
Scale: AS NOTED
File Name: SHEET02.DGN
Drawing No.: 2 of 2
Issue: 1

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY JOHN M. DOMPESKI, E-SIGN ON APRIL 7, 2011. THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT

ADDENDUM NO. 3

WEST HAYMARKET JOINT PUBLIC AGENCY
HAYMARKET INFRASTRUCTURE IMPROVEMENT
INITIAL HAYMARKET SITE PREPARATION
PROJECT NO. 870703
BID NO 11-079

TO ALL PROSPECTIVE BIDDERS:

1. North 48th Street Site Beneficial Fill SWPP has been added

STORM WATER POLLUTION PREVENTION PLAN

FOR

CONSTRUCTION ACTIVITIES

AT

CITY OF LINCOLN
NORTH 48th STREET SOLID WASTE FACILITY

5101 NORTH 48th STREET
LINCOLN, NEBRASKA

ORIGINAL ISSUED January 2009 for:
Project #701473 / Phase 2 - Construction & Demolition Landfill Capping
Project #701472 / Phase 5 - Landfill West Cover

REVISED ISSUED April 2011 for addition of:
Project #701482 / Beneficial Fill associated with JPA Project #870703 / Initial Site Preparation for West Haymarket Infrastructure Improvements

The undersigned certifies that this plan has been designated in accordance with federal NPDES guidelines and approved erosion, sediment and storm water ordinances, programs, regulations, standards and criteria of the City of Lincoln.

This document was originally issued and sealed by John M. Dempsey, E-5621 on April 7, 2011. This media should not be considered a certified document.

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Figure 1 North 48th Street Solid Waste Facility Location

Figure 2 Project #701482 / Beneficial Fill associated with JPA Project #870703 / Intitial Site Preparation for West Haymarket Infrastructure Improvements

Appendix A Site Plan Sheets, Details and Notes
(NOTE: Plan Sheets for Project #701472 / Phase 5 – Landfill West Cover and Project #701473 / Phase 2 – Construction and Demolition Landfill Cap are not attached to this copy of the revised version of the SWPPP)

STORM WATER POLLUTION PREVENTION PLAN
OWNER AND CONTACT

Owner:	City of Lincoln, Nebraska Wastewater and Solid Waste Operations Division
Owner Address:	2400 Theresa Street Lincoln, NE 68521
Phone:	402-441-7961
ORIGINAL Project:	Project #701473 / Phase 2 - Construction and Demolition Landfill Capping Project #701472 / Phase 5 - Landfill West Cover
ADDED Project:	Project #701482 / Beneficial Fill associated with JPA Project #870703 / Initial Site Preparation for West Haymarket Infrastructure Improvements
Project Address:	5101 North 48th Street
Location:	Lincoln, Nebraska
Owner Type:	Municipal Solid Waste Management Facility

Owner's Contact and Project Manager:

Name:	Ms. Karla Welding
Title:	Superintendent of Solid Waste Operations (Superintendent)
Phone:	Office: (402) 441-7867 Cell: (402) 416-0208

Contractor responsible for storm water pollution prevention for construction activities associated with Project #701482 / Beneficial Fill associated with JPA Project #870703 / Initial Site Preparation for West Haymarket Infrastructure Improvements:

Contractor: _____

Address: _____

Site Contact: _____

Telephone Number: _____

OWNER'S CERTIFICATION

I certify that this document was prepared under my direction in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, and those persons directly responsible for gathering the information, the information in this document is, to the best of my knowledge and belief, true, accurate, and complete.

Owner: _____

Date: _____

Name: _____

Signature: _____

Title: _____

Telephone Number: _____

CONTRACTOR CERTIFICATION

I certify that I understand the terms and conditions of this Storm Water Pollution Prevention Plan (SWPPP) and how to manage storm water discharges associated with construction site activity. I understand that my company is legally required by the contract documents to ensure compliance with the terms and conditions of this SWPPP and the NPDES Construction Stormwater Permit.

Contractor: _____

Date: _____

Name: _____

Signature: _____

Title: _____

Address: _____

_____

_____

Telephone Number: _____

SWPPP DISTRIBUTION LIST

Because revisions to this document are anticipated, document control is necessary. As a result, each copy of this document will have a distribution page that lists the document number and the holder of each copy.

Document No.	Holder
1	
2	
3	

REVISIONS TO THE SWPPP

The Contractor and/or City will make revisions to this plan as a result of periodic visual inspections and observations made during the implementation of daily project activities. If a situation arises that could cause non-compliance with a NPDES permit condition or violates the objective of minimizing the pollutants contacting storm water runoff, a plan revision is warranted. In addition, any project change that affects the project's potential to discharge sediment or other pollutants to the storm water warrants a plan revision to accurately reflect the Site features and operations.

Revision Date	Prepared By	Revision Description	Initials & Affiliation I have completed my review and evaluation of this plan and approve the document and its revisions.	
04/06/2011	City of Lincoln	Added Project #701482 / Beneficial Fill associated with JPA Project #870703 / Initial Site Preparation for West Haymarket Infrastructure Improvements and incorporated general revisions to plan requirements.	Contractor	City

Storm Water Pollution Prevention Plan

1.0 Purpose

This Storm Water Pollution Prevention Plan (SWPPP) identifies the possible sources of pollution and the best management practices to be implemented to minimize the potential for pollutants to impact storm water during project activities related to:

Original: Project #701473 / Phase 2 – Construction and Demolition Landfill Capping
Project #701472 / Phase 5 – Landfill West Cover

Revised: Project #701482 / Beneficial Fill associated with JPA Project #870703 / Initial Site Preparation for West Haymarket Infrastructure Improvements

2.0 Project Location

The City of Lincoln, Nebraska, (City) owns and operates a solid waste facility that is located approximately 4 ½ -miles northeast of downtown Lincoln, Nebraska on land that lies southwest of the intersection of L55x (North 56th Street) and Salt Creek. The facility location is depicted in Figure 1.

3.0 Project Description

The City constructs a cover/cap system at regular intervals on Landfill West and on the Construction and Demolition Waste Landfill. The general purpose of the cover/cap system is to minimize water infiltration and stabilize the land surface. The cover/cap system includes the existing intermediate cover, compacted soil layer, erosion layer and vegetative cover.

The original construction activities for which this SWPPP was prepared included Project #701473 / Phase 2 - Construction and Demolition Waste Landfill Cap (approximately 14 acres) and Project #701472 / Phase 5 - Landfill West Cover (approximately 40 acres). The SWPPP has been revised to include Project #701482 / Beneficial Fill associated with JPA Project #870703 / Initial Site Preparation for West Haymarket Infrastructure Improvements (approximately 26 acres). This project location is depicted graphically in Figure 2.

4.0 Facility Description

The area features of the North 48th Street Solid Waste Facility include: the scale house and maintenance buildings; an active, permitted Construction & Demolition Waste Landfill; a small vehicle solid waste transfer station and customer convenience areas for recycling used oils, scrap metals, spent lead acid batteries, and tires; an appliance demanufacturing facility; locations for brush and yard waste processing; load-out areas for compost and wood chip materials; a multi-material drop-off area for traditional recyclable materials; areas where historic municipal landfilling has occurred, and unused property. The North 48th Street Solid Waste Facility (Site) cumulatively occupies approximately 350-acres of land owned by the City. Less than five-percent of the property consists of impervious surface features, including facility structures, vehicle parking lots, access roads, and material storage areas. The remainder of the property consists of the landfill, marshland and both grassed and non-vegetated land surfaces. The amount of impervious and pervious surface area will experience little change as the planned project activities do not involve the construction of hard surface structures that would generate high velocity sheet flow.

The local topography exhibits little relief as portions of the Landfill West are located in the flood plain of Salt Creek. Landfill West is a covered landfill area that reached planned disposal capacity in 1990 and is situated in the southwest corner of the Site. It has a peak elevation of approximately 1,160-feet sloping downhill to varying elevations of approximately 1,140-feet to 1,150-feet at the perimeter boundary. The surface is poorly drained where recent cover projects have not been undertaken. The area slopes gently at approximately 1 percent grade where recent cover projects have been completed. Landfill West has two primary drainage paths. One area drains to the northwest into an on-site drainage ditch and into Roper Lakes. Roper Lakes is a small surface water body/marshland that acts as an area catch basin except during extremely high water levels when it overflows into Salt Creek. The other drainage path from Landfill West goes southwest into an on-site drainage ditch and into Salt Creek.

The Construction & Demolition Waste Landfill drains to the east into a ditch that parallels L55x to the north for approximately ½ mile before discharging into Salt Creek and into a ditch that discharges into Salt Creek. The Construction & Demolition Waste

Landfill has an elevation of approximately 1,180-feet along its north-south peak (drainage divide) sloping downhill to an elevation of approximately 1,140 at its eastern edge and 1,150 at the western edge.

The Lincoln area receives an annual average precipitation of approximately 30-inches, with the rainfall evenly distributed throughout the year. The 25-year 24-hour storm event for this area is approximately 5.3 inches of precipitation.

5.0 Existing Site Conditions

Landfill West has an existing soil cover that is vegetated with grass. The Construction & Demolition Waste Landfill has both vegetated and non-vegetated land surfaces. Calculation of runoff before and after project related activities indicates that there will be no net increase in peak runoff as a result of the projects.

6.0 Adjacent Areas

The Site is bounded on the north and west by Salt Creek. L55x (North 56th Street) borders the Site along its eastern boundary with light industrial uses on the east side of the road. The south side of the Site also has light industrial parcels and recreational use areas.

7.0 Off-Site Areas

A surface layer of soil will be imported from off-site area and placed upon the rough graded areas defined by each project. These imported soils may originate from various locations in Lancaster County. The surface layer is designed to support the growth of planted grasses and other vegetation.

8.0 Soils

The predominant native soils that characterize the Site include the Kennebec, Nodaway and Zook silt loams that were formed in alluvium of the Salt Creek flood plain. These soils can range widely from moderately well to poorly drained conditions.

9.0 Critical Areas

There are no critical areas within the project boundary that would require set-backs or buffer areas, or if disturbed would require approval from other jurisdictional agencies.

10.0 Construction Schedule

Project #701473 / Phase 2 - Construction & Demolition Landfill Capping and Project #701472 / Phase 5 - Landfill West Cover were initiated in March 2009. Although the placement and grading of soils, and the installation of stormwater conveyance structures for Project #701472 / Phase 5 – Landfill West Cover is complete, the project still requires the establishment of permanent vegetation. Project #701482 / Beneficial Fill associated with JPA Project #870703 / Initial Site Preparation for West Haymarket Infrastructure Improvements is anticipated to begin in May 2011 and continue through the end of 2011. Erosion and sediment controls will be maintained throughout construction. Post-construction stabilization controls will be monitored for successful implementation prior to notification of termination.

11.0 Sequence of Events

The major work elements to be accomplished under this SWPPP are outlined in the below listing. The sequence of events may be altered in order to accommodate a more efficient and effective use of labor and equipment. Major deviations will be reflected via revision to this SWPPP.

1. Install silt fence for sediment control along the downstream perimeter of the construction area prior to any grading activities.
2. Rough grade areas where soils are to be placed.
3. Place and compact imported soils in accordance with the project specifications and grading plan.
4. Provide dust control measures whenever conditions require.
5. Conduct routine site evaluations and implement additional or revise existing Best Management Practices (BMPs) as necessary.
6. Repair and maintain erosion and sediment control systems.
7. Plant temporary and permanent vegetative cover.

The City will file a Notice of Termination with the Nebraska Department of Environmental Quality (NDEQ) and Lower Platte South Natural Resources District (LPSNRD) when the project areas have been adequately stabilized and temporary erosion and sediment control systems have been removed.

12.0 General Best Management Practices (BMPs)

Best Management Practices are physical, structural and/or managerial practices used to prevent or reduce storm water pollution from construction activities. The BMPs for areas disturbed as the result of construction activities are intended to accomplish the following objectives:

1) Unless otherwise indicated, all structural and vegetative erosion and sediment control practices and storm water management practices will be constructed and maintained according to the minimum standards and specifications of the LPSNRD Manual of Erosion and Sediment Control and Stormwater Management Standards, dated 1994 and approve supplements.
2) The physical erosion and sediment control practices shall comply with Title 28 – Stormwater Quality and Erosion and Sediment Control of the Lincoln Municipal Code, including all current provisions of the City's Design Standards, and the City's Drainage Criteria Manual.
3) Permanent or temporary stabilization shall be completed within seven (7) calendar days to any other disturbed or graded areas which are not being used for material storage or on which actual earth moving activities are being performed.
4) Protect excavated and filled areas with erosion and sediment controls so that no storm water is allowed to discharge without passing through a control system. Erosion and sediment controls will be installed prior to the beginning of construction, to the extent possible, and will be maintained until final stabilization has occurred.
5) Preserve existing vegetation to the maximum extent possible.
6) Delineate the project area perimeter to prevent disturbing areas outside of the project limits and to ensure disturbance is limited to the smallest area possible.
7) Perform activities and store all materials and wastes in a manner that prevents potential pollutants from coming in contact with storm water.
8) Minimize the transport of sediment by vehicular tracking where construction vehicle access routes intersect paved public roads.
9) Clean sediment carried by construction vehicles onto paved road surfaces by scraping/shoveling or sweeping as required, but no less than once per day.

13.0 Structural Best Management Practices (BMPs)

13.1 Erosion Control

Erosion controls serve as a source control designed to prevent sediment from becoming suspended in the storm water runoff.

1) Install compost filter sock barrier(s) to interrupt the slope length and thereby minimize erosion from sheet flow.
2) Construct final grades with smooth slopes and uniform surfaces to connect drainage from the construction area to existing drainage patterns.

13.2 Sediment Control

Sediment controls are structural measures that are intended to compliment the erosion control measures.

1) Install silt fence at the downstream perimeter of disturbed area to intercept and detain small amounts of sediment.
2) Install sediment protection around all culverts and inlets receiving runoff from the construction area to prevent eroded sediment from discharging to drainage ditches.

14.0 Vegetative Best Management Practices

Final stabilization features include permanent vegetation across the disturbed areas to slow the discharge velocity of storm water and to minimize damage from erosion.

1) Stabilize the disturbed areas as soon as practical with an appropriate mixture of quick germinating grasses/seed crops and perennial grasses both as temporary and permanent vegetation, applying mulch, as necessary, immediately after seeding.
2) Install erosion matting, as necessary, to defined drainage pathways and ditches.

15.0 Material Management Best Management Practices

Best Management Practices may be applicable if chemicals, fuels, lubricants, liquid and solid wastes are used, handled, generated or managed on-site.

<u>Material Delivery and Storage</u>

1) Chemical storage containers or tanks must include or be placed in a secondary containment structure that is sufficiently impermeable to seepage and provides

enough capacity for the volume of the tank plus 5.3 inches of free-board for a 25-year 24-hour storm event.

2) Locate material storage areas as far away from drainage paths as possible.

Vehicle & Equipment Refueling

1) Locate refueling areas on level ground and as far away from drainage paths as possible.
2) Provide spill response materials at all vehicle and equipment refueling locations.
3) Fueling nozzles must automatically shutoff when the fuel level in the tank reaches the nozzle.
4) Construct a berm around refueling areas so that spills can be contained and impacted soils/materials easily cleaned up.

Vehicle & Equipment Maintenance

1) Perform all vehicle and equipment maintenance activities at off-site locations, when possible.
2) Construct a berm around the vehicle or equipment to contain spills if on-site maintenance must be performed.

Solid Waste Management

1) Collect and properly dispose of any solid wastes generated as a result of project related activities.

Sanitary Waste Management

1) Locate sanitary facilities (portable toilets) on level ground and away from any drainage pathways.
2) Secure sanitary facilities to the ground surface to prevent tipping or toppling.
3) Regularly pump septage and/or replaced with clean units.

16.0 Material Inventory

Materials typically consumed or generated during project related activities have been identified and evaluated for their potential to contribute pollutants to the storm water. Table 16-1 identifies an inventory of potentially exposed materials and activities that could impact storm water. Visual monitoring of the discharge points, the sediment and

erosion control devices and containment areas is required throughout the project. Chemical analysis of the storm water discharges from the project areas is not anticipated, but may become necessary if spills are observed during visual inspections or during daily activities.

TABLE 16-1
POTENTIALLY EXPOSED MATERIALS AND ACTIVITIES

Note: This table is for example purposes only and presents an inventory of materials that are typical for this type of project. The table must be modified to correctly and accurately reflect potential pollutants and material management practices specific to the work being performed.

Material	Purpose	Quantity Exposed (units)	Affected Drainage Area(s)	Location	Material Management Practice
Diesel & Gasoline	Vehicle & equipment refueling	Exposure only if an accidental release occurs.	Various	Designated refueling areas	Earthen containment berms or secondary containment tanks around the fuel handling areas.
Lubricants and Oils	Vehicle and equipment operation	Exposure only if an accidental release occurs.	Various	Designated vehicle and equipment maintenance, parking/staging and material storage areas	Earthen containment berms or other method of secondary containment around the vehicle and equipment maintenance and material handling areas, and drip pans in vehicle and equipment parking/staging areas.
Sediment from Clearing, Grubbing, and Grading	None	Not Available	Various	Designated project area	Install silt fence and other sediment and erosion control practices around the disturbed and impacted areas.
Solid Waste	None	Not Available	Various	Designated project area	Collect and remove solid wastes.
Construction Waste	None	Not Available	Various	Designated project area	Collect and remove general construction wastes.
Sanitary Waste	None	Not Available	Various	Portable toilet locations	Secure portable toilets to level ground and away from drainage path.

17.0 Maintenance and Inspection

All sediment and erosion control systems will be inspected by responsible personnel at least once every seven (7) calendar days and after any storm event of greater than 0.5 inches of precipitation during any 24-hour period. Any necessary repairs or sediment removal to maintain the effectiveness of the best management practices shall be made immediately. If installation, repair or maintenance of sediment and erosion control systems are impractical prior to a storm event, the situation shall be documented in the SWPPP and alternative best management practices (BMPs) drafted and implemented as soon as possible.

All erosion and sediment control systems shall be maintained in accordance with the requirements specified in the City of Lincoln Drainage Criteria Manual, 2000 or the LPSNRD Manual of Erosion and Sediment Control and Stormwater Management Standards, dated 1994, and approved supplements.

18.0 Spill Plan

Other than sediment, potential pollutants may include (but are not limited to) fuel, lubricants, or chemicals. Materials that have the potential to impact storm water will be stored, managed, used, and disposed of in a manner that minimizes the potential for releases to the environment and especially into storm water. General response activities:

1) Post storage, cleanup and spill reporting instructions in a conspicuous and accessible location.
2) Respond quickly to a spill, release or incidental leakage from vehicles or equipment to stop the flow of product and prevent the material from reaching the drainage ways and ditches.
3) Remove and properly dispose of all spilled or leaked product and any contaminated soils or other media.
4) Document the incident and the response actions taken, including any notifications made to regulatory agencies, and report immediately to the City.
5) Modify the SWPPP within 14-days of an incident to describe the release, the circumstances leading to the release, and steps taken to prevent another occurrence.

18.1 Spill Response

The actions outlined in Table 18-1 will be executed in a timely manner if a leak, spill, or accidental release of pollutants imminently threatens storm water.

Table 18-1

SPILL RESPONSE ACTIONS AND NOTIFICATION PROCEDURES

Actions	Notes
Notify the On-Site Project Superintendent	Contact immediately if a leak, accidental release or spill is discovered.
Notify City's Project Manager and/or the Superintendent of Solid Waste Operations	The City's Project Manager and/or Superintendent of Solid Waste Operations will assess the situation and facilitate any additional response actions and notifications.
Shut Off Ignition Sources	Shut off electrical circuits and motors, and remove sources of open flame or heat from the spill area.
Stop the Flow of Product	Initiate procedures to stop the release if there is reasonable certainty that the origin of the leak is not a hazardous substance and the release can be stopped near its source with no danger to human health or safety. Only members of a response team with training in EPA/OSHA spill response and the use of personal protective equipment (PPE) are allowed to respond to a spill or accidental release of a hazardous substance.
Identify the Material Released	Identify the material released from container labels or tank placards. If the material cannot be identified, consult the MSDS for the name of the released material, its characteristics and the appropriate PPE to be worn while responding.
Warn Personnel	Enforce safety and security measures and warn employees and visitors of the spill condition.
Contain the Release	Contain the release using absorbent materials, temporary earthen berms, drain inlet covers, or other appropriate measures to minimize the spread of material to the environment.
Clean Up Spilled Material	Clean up spilled material in an appropriate manner (i.e., vacuum pump for liquids, shovels and/or brooms for spent absorbent or solid materials, or as outlined in the MSDS).
Dispose of Cleanup Materials	Place cleanup materials in proper containers, segregating solids from liquids and appropriately label for storage and disposal. Dispose of materials in accordance with state and local requirements.

Table 18-1 (cont'd)

SPILL OR RELEASE NOTIFICATION LIST

Name/Title	Phone	Notes
City's Project Manager and/or Superintendent of Solid Waste Operations	Office: 402-441-7867 Cell: 402-416-0208	Facilitate follow-up response actions and notification procedures, if needed.
Nebraska Department of Environmental Quality (NDEQ) Release Assessment Program 8:00 am – 5:00 pm Monday thru Friday Nebraska State Patrol (After-hours, holidays and weekend contact)	1-877-253-2603 1-402-471-4545	On-Site Project Superintendent to notify NDEQ immediately when: • An oil or petroleum product spilled onto the bare ground is in excess of 25 gallons; or • An oil or petroleum product spill of any amount that could potentially reach waters of the state or produce a visible sheen; or • Any chemical spilled outside of secondary containment that reaches the environment in an amount that exceeds its reportable quantity or 100 pounds, whichever is less.
EPA National Response Center	800-424-8802	On-Site Project Superintendent to notify the NRC immediately if: • An oil or petroleum product spill of any amount that could potentially reach waters of the state, produce a visible sheen or violate water quality standards; or • A release of more than the reportable quantity of a hazardous substance as identified in 40 CFR 116.
Lincoln Fire and Rescue Hazardous Materials Response Team/Unit Lincoln/Lancaster County Health Department / Emergency Response	911 Will be dispatched via 911 call center	Notify immediately in the event of a release of a hazardous substance that may be a threat to human health or the environment, or if assistance is required to contain a release or complete a cleanup.

SPILL OR RELEASE NOTIFICATION INFORMATION

Information to Provide
1) The name and telephone number of the On-Site Project Superintendent.
2) The exact address of the facility, and the location at the facility where the spill or release occurred.
3) The date, time and cause of the discharge.
4) The chemical name of the material discharged.
5) The source of the discharge.

6)	An estimate of quantity discharged and the duration of the incident.
7)	Name of nearest waters involved and all affected media.
8)	Response actions being used to stop, contain, remove and clean up the discharge.
9)	The extent of injuries if any, precautions being taken and any known health risks associated with the incident.
10)	Evacuation area, if required.
11)	Identity of governmental and/or private sector representatives who have been notified or are responding on-scene.
Information to Ask For	
1)	Name of agency official receiving call.
2)	Spill or incident number.
3)	Agency intentions or plans.
4)	Any emergency procedures considered necessary.
5)	Address for submitting written report.

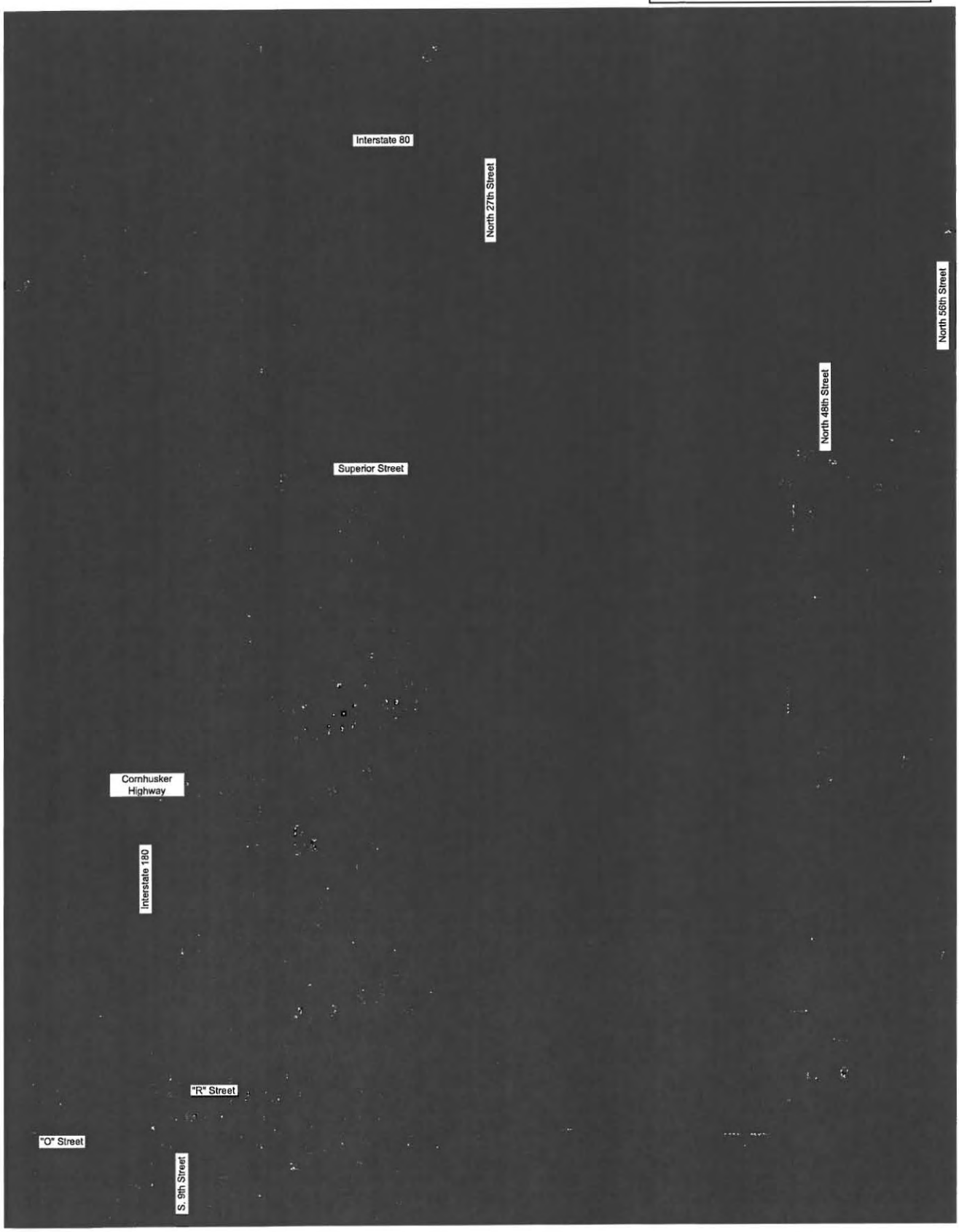
INCIDENT REPORTING

A spill or release that requires state agency notification may also require a follow-up report. The NDEQ may require that the On-Site Project Superintendent or their designee prepare and transmit the appropriate agency reports within 15-days of the incident (NDEQ Title 126). Reports will be sent to the Nebraska Department of Environmental Quality, 1200 "N" Street, Suite 400, PO Pox 98922, Lincoln, Nebraska 68509.

If the facility has a spill that discharges more than 1,000-gallons in a single event to waters of the U.S., or more than 42-gallons in each of two discharges occurring within any 12-month period, the On-Site Project Superintendent or their designee will prepare and transmit the appropriate reports to the EPA Regional Administrator and the NDEQ within 60-days of the qualifying incident. The report contents are specified in 40 CFR 112.4.

FIGURES

SWPPP Figure 1



North 48th Street Solid Waste Facility

Project #701482 / Beneficial Fill associated with JPA Project #870703 / Initial Site Preparation for West Haymarket Infrastructure Improvements

Project #701742
Phase 2 - Construction and Demolition Landfill Cap

Fletcher Street
or
"Back Gate"

Phase 4
Completed

Phase 3
Completed

Permitted Construction and Demolition Debris Landfill

North 56th Street

Project # 701472
Phase 5 - Landfill West Cover

Transfer Station
and
Gatehouse

North 48th Street

Appendix A

COORDINATE TABLE				
POINT ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	849895.309	785304.738	7152.5	LIMITS OF GRADING
2	849705.684	785281.209	7154.0	LIMITS OF GRADING
3	850081.479	785852.838	7158.0	LIMITS OF GRADING
4	850281.749	785905.883	7158.0	LIMITS OF GRADING
5	850541.138	785937.338	7158.0	LIMITS OF GRADING
6	850408.287	786987.050	7158.0	LIMITS OF GRADING
7	850681.707	786933.171	7156.0	LIMITS OF GRADING
8	850740.323	786203.085	7154.0	LIMITS OF GRADING
9	850894.703	786161.785	7152.0	LIMITS OF GRADING
10	851076.481	786171.848	7150.0	LIMITS OF GRADING
11	850907.575	786836.867	7150.0	CREST OF COMPACTED FILL
12	850716.280	786487.344	7152.0	CREST OF COMPACTED FILL
13	850978.658	786463.465	7154.0	CREST OF COMPACTED FILL
14	850936.848	786327.732	7156.0	CREST OF COMPACTED FILL
15	850736.244	786850.740	7158.0	CREST OF COMPACTED FILL
16	850117.670	786276.776	7158.0	CREST OF COMPACTED FILL
17	849915.547	786235.341	7154.0	CREST OF COMPACTED FILL
18	849795.651	786127.771	7152.0	CREST OF COMPACTED FILL
19	849522.852	786128.825	7151.0	CREST OF COMPACTED FILL
20	849503.753	786028.242	7151.0	CREST OF COMPACTED FILL

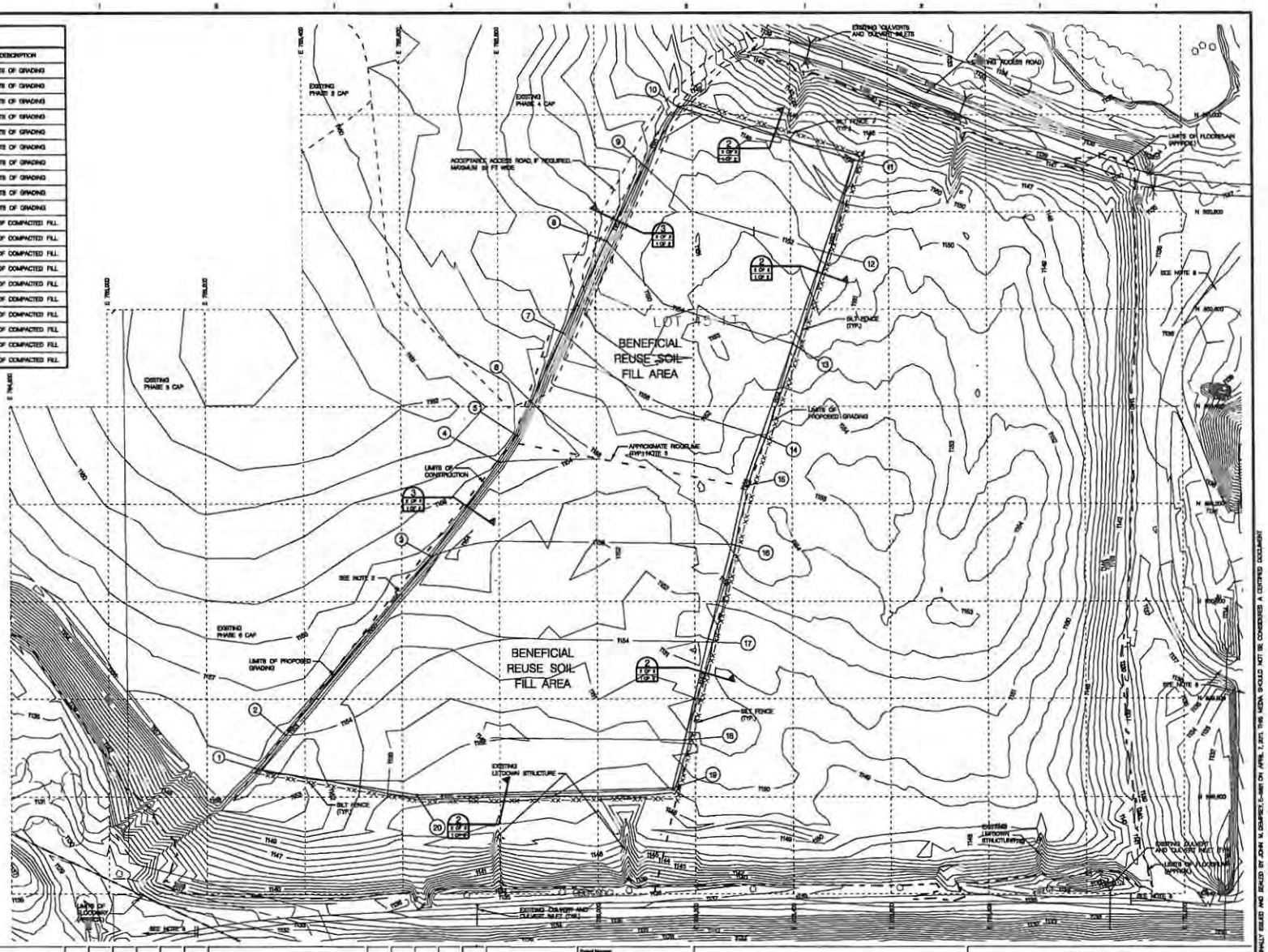
N

SCALE

0 100 200 300

NOTES:

1. SEE SPECIFICATION ON BENEFICIAL SOIL AND CONSTRUCTION AND DEMOLITION WASTE MATERIAL REQUIREMENTS FOR ADDITIONAL INFORMATION.
2. MATCH GRADES FOR BENEFICIAL REUSE SOIL TO BE 2 FEET MINIMUM LOWER THAN EXISTING GRADES IN PHASE 4 AND 6 CAPPING AREAS.
3. CITY MAY DIRECT FILLING PRIORITY NORTH OR SOUTH OF RIDGELINE.
4. AVOID CROSS CONTAMINATION OF THE EXISTING PHASE 4 AND 6 AREA CAPS. DO NOT TRACK OR MOVE SOILS FROM THE PROPOSED FILL FOR BENEFICIAL SOIL REUSE ACROSS THESE AREAS.
5. PROTECT EXISTING GRASSING VEGETATION, AND EROSION CONTROLS.
6. LIMIT ACTIVITY IN FLOODPLAIN TO THE GREATEST EXTENT POSSIBLE. NO ACTIVITY PERMITTED IN FLOODWAY.
7. ALTERNATE ACCESS ROADS TO BENEFICIAL SOIL REUSE AREA SUBJECT TO CITY APPROVAL.
8. USE OF EXISTING PERIMETER ROAD IN THESE AREAS IS PROHIBITED WITHOUT CITY'S WRITTEN APPROVAL.
9. BACKGROUND TOPOGRAPHY FROM HWS CONSULTING GROUP (02/26/2009)
10. SOILS CONTAINING LEAD ARSENIC AND PETROLEUM HYDROCARBONS AND SIMILAR CONTAMINANTS SHALL NOT BE USED FOR ROAD MAINTENANCE OR PLACED OUTSIDE BENEFICIAL REUSE SOIL FILL AREAS.
11. SITE COORDINATES ARE BASED UPON MODIFIED STATE PLANE COORDINATE SYSTEM. ELEVATIONS ARE NGVD. ADDITIONAL SURVEY CONTROL DATA IS AVAILABLE FROM CITY OF LINCOLN.



HDR

HDR Engineering, Inc.

Issue No.	Description	Date	Issue No.	Description	Date
1	ISSUED	4/11			

Project Manager: J. DEMPSEY
Architect: NO Version
Civil: FL BELL
Mechanical
Structural
Electrical
Project Engineer
Drawn By

City of Lincoln, Nebraska
North 48th Street
Beneficial Fill Grading Plan

GRADING PLAN & CONTROL

PROJECT #70489 / BENEFICIAL FILL ASSOCIATED WITH JPA PROJECT #60703 / INITIAL SITE PREPARATION FOR WEST HAYMARKET INFRASTRUCTURE IMPROVEMENTS

Date	Project No.	Drawing No.	Sheet
APRIL 2011	60309	1 of 2	1
Scale: AS NOTED	File Name: SHEET01.DGN		

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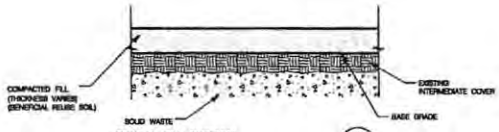
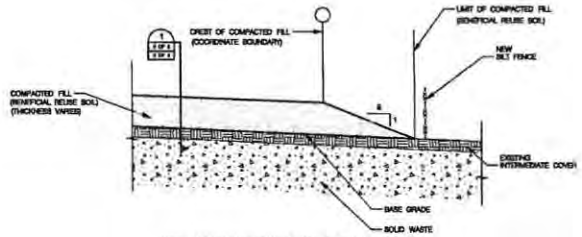
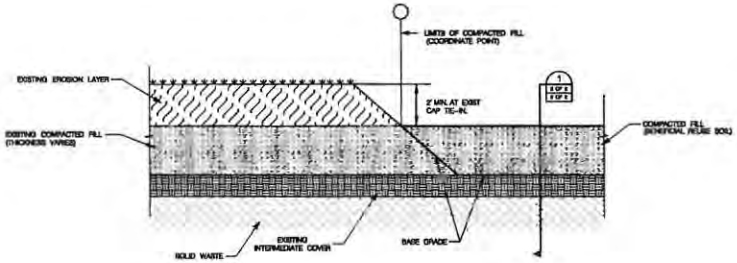


TYPICAL FILL SECTION
NO SCALE
1
2 OF 2
2 OF 2

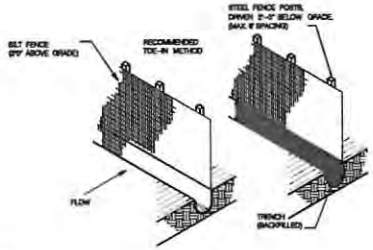


NOTE: THIS DETAIL APPLIES WHERE FILL SOIL IS TERMINATED AT INTERMEDIATE LOCATIONS.

COMPACTED FILL TERMINATION DETAIL
NO SCALE
2
2 OF 2
1 OF 2



EXISTING CAP CONNECTION DETAIL
NO SCALE
3
2 OF 2
1 OF 2



NOTES:
1. SEE SPECIFICATIONS FOR MINIMUM REQUIREMENTS FOR INSTALLATION AND MAINTENANCE.

SILT FENCE DETAIL
NO SCALE
4
2 OF 2
2 OF 2

HDR

HDR Engineering, Inc.

Issue No.	Description	Date
1	ISSUED	4/11

Issue No.	Description	Date

Project Manager: J. DEMPSEY
Author: | QC Reviewer:
Cad: R. BELL | Submitted:
Checked: | Reviewed:
Project Engineer: | Drawn By:

City of Lincoln, Nebraska
North 48th Street
Beneficial Fill Grading Plan

GRADING AND CONTROL DETAILS

PROJECT #701492 / BENEFICIAL FILL ASSOCIATED WITH JPA PROJECT #87010 / INITIAL SITE PREPARATION FOR WEST HAYMARKET INFRASTRUCTURE IMPROVEMENTS

Date	Project No.	Drawing No.	Sheet
APRIL, 2011	87010	2 of 2	1
Scale: AS NOTED	File Name: SHEET02.DGN		

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ADDENDUM NO. 4

WEST HAYMARKET JOINT PUBLIC AGENCY
HAYMARKET INFRASTRUCTURE IMPROVEMENT
INTITIAL HAYMARKET SITE PREPARATION
PROJECT NO. 870703
BID NO. 11-079

Addenda are instruments issued by the Purchasing Office prior to the date or time for receipt of offers which will modify or interpret the specifications document by addition, deletion, clarification or correction.

Please acknowledge receipt of this addendum in the space provided in the Attribute Section.

Please be advised of the following changes and clarifications to the City's specification and bidding documents:

1. The bid form and the Summary of Quantities, Sheets 2 and 3 in the plans have been updated as follows:

The following bid items have been deleted:

22.0700	Standard MH Type "S"	1 EA
22.0710	Standard MH Type "S" 2	11.3 LF
50.0010	Excavation of Construction and Demolition Waste	1,000 CY
50.0010	Stockpiled Soils, Construction and Demolition Waste	500 CY

The following bid items have been added:

22.0720	Standard MH Type "R"	1 EA
22.0730	Standard MH Type "R" 2	15.6 LF
50.0001	24'-0" Wide Double Swing Gate	1 EA
50.0005	24" CMP Storm Sewer	115 LF
50.0035	Excavation of Construction and Demolition Waste	1,700 TON
50.0035	Stockpiled Soils, Construction and Demolition Waste	850 TON
50.0035	Disposal of Petroleum Contaminated Soils	1,000 TON

The following bid quantities have been revised to reflect the quantities as shown below:

01.0100	Pavement and Sidewalk Removal	941 CY
01.0210	Sawing, Type "A"	287 LF
02.0601	Earthwork Measured in Embankment	102,426 CY
10.0010	Crushed Rock Surfacing (In Place)	9,580 CY
14.0201	Relocate Sign and Post	2 EA

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21.0090	RCP Storm Sewer Class III	124 LF
21.0940	Conc for Collars, Elbows & Hdwls (In Place)	3.52 CY
21.0950	Reinf Steel for Collars, Elbows & Hdwls (In Place)	379 LBS
21.2090	Geotextile Filter Fabric (In Place)	8,756 SY
22.0070	Sanitary Sewer Pipe, 10"	20 LF
50.0040	Temporary Surfacing	576 SY

2. Refer to Addendum No. 1, "Earthwork Construction" Special Provision.

   Add the following statement to end of the subsection on "Excavation of Beneficial Reuse Soils" and to the end of the subsection on "Stockpiled Soils for Beneficial Reuse":

   > "If petroleum contaminated soils are encountered during completion of this work, refer to the Special Provision on Contaminated Soils for additional information on management and disposal of the petroleum contaminated material."

   Refer to the subsection on Excavation of Construction and Demolition Waste. Replace the first sentence of the second paragraph in this subsection with the following:

   > "Payment for excavation of soils that do not meet the requirements for beneficial reuse soils but is considered as Construction and Demolition Waste material shall be made at the contract unit price bid per ton for the pay item "Excavation of Construction and Demolition Waste".

   Refer to the subsection on Stockpiled Soils,Construction and Demolition Waste. Replace the first sentence of the second paragraph in this subsection with the following:

   > "Payment for stockpiled soils that do not meet the requirements for beneficial reuse soils but is considered as Construction and Demolition Waste material shall be made at the contract unit price bid per ton for the pay item "Stockpiled Soils, Construction and Demolition Waste".

3. Refer to the Special Provisions, page 21, "Dewatering".

   Add the following statement at the end of this Special Provision:

   "The Contractor will be required to sign a Certification of Compliance to abide by the requirements of the Dewatering Permit for the Project."

   The attached Contractor Certification of Compliance NPDES Dewatering Discharge Permit No. NEG671000 document is attached to these contract specifications.

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In addition, a copy of the Dewatering NOI and respective letter correspondence from the NDEQ are attached to these contract documents. The Contractor shall abide by all requirements included in the project dewatering permit as supplemented by the project specific requirements outlined in the attached NDEQ correspondence.

4. Refer to the Special Provisions.

   Add the following new Special Provisions attached to this addendum to the contract documents:

   Contaminated Soils

   Chain Link Fence Swing Gate

5. Refer to the plans, Sheet No. 6, General Notes, "Earthwork Summary Table".

   Delete the table shown in the existing plans and replace with the attached revised Earthwork Summary table and notes.

6. Refer to the plans, Sheet 11, Details

   Replace the Sheet with the revised sheet to show details for the double swing fence gate.

7. Refer to the plans, Sheet 13, Horizontal and Vertical Control.

   Replace the Sheet with the revised sheet attached to this addendum.

8. Refer to the plans, Sheet 7, Haul Route Plan.

9. Replace the sheet to update the notes pertaining to the entrance and haul routes to the stockpile sites as shown on the attached plan. These changes identify additional drainage pipe construction, earthwork construction, crushed rock for construction entrances, geotextile filter fabric and installation of a double swing gate at this location. The plan quantities and bid items have been revised as part of this addendum to reflect this additional work.

10. Refer to the plans, Sheet 63, Sanitary Sewer Plan and Profile.

    Replace the Sheet with the revised sheet attached to this addendum.

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11. Refer to the attached plan sheet labeled "Phase IA, 9th and "N" Street Work".

    Attach this plan sheet to the phasing plans to show additional work required at the intersection of 9th and "N" Street. The plan quantities and bid items have been revised as part of this addendum to reflect this additional work.

12. Refer to the minutes from the Pre-Bid Meeting. These minutes along with the BNSF Temporary Shoring Guidelines are attached to the contract documents as part of this addendum.

13. Refer to the attached questions from prospective bidders and the responses to those questions.

Dated this 15th day of April, 2011.

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Questions received from Prospective Bidders for the Initial Haymarket Site Preparation Project.

1. Since the unit price for " Grading for North 48th Street Site" is a fixed $ 1.25 / CY, under which line item should the contractor account for cost associated with clearing & grubbing the north 48th street site, discing, haul road maintenance, dust control, tire repair and management?

Response: The fixed unit price of $1.25 per cubic yard for the bid item "Grading for North 48th Street Site" was determined based upon research of historic bid and contract information for placing of beneficial reuse soils at the North 48th Street location. These previous prices included the costs associated with the clearing & grubbing, haul road maintenance, dust control, erosion and sediment control, staking, tire repair and other management items as outlined in the Special Provision for Work at the North 48th Street Solid Waste Facility. If prospective bidders believe that the $1.25 per cubic yard cost does not cover all of these costs than those additional costs can be considered to be subsidiary to the bid items for the "Excavation for Beneficial Reuse Soils" and the bid item for the "Stockpiled Soils for Beneficial Reuse". The total estimated volume of work for the "Grading for the North 48th Street Site" is directly tied to the quantities for the aforementioned bid items.

2. For line item number 143 "Excavation of construction and demolition waste" and line item number 145 "stockpiled soils, construction and demolition waste", can this be paid by the ton instead of by the cubic yard because that is how the landfill will charge and it will be easier to quantify it based on scale tickets from the North 48th street landfill than to survey it? Then no one is trying to guess the weight and moisture contents of the soil and waste mixture we will be disposing of.

Response: The bid proposal has been revised to change the quantity and unit of measurement and payment for these items from cubic yard to Ton. The Earthwork Construction Special Provision issued as part of Addendum No. 1 has also been revised as part of this addendum to reflect this change. Final measurement and payment will be based upon the total tonnage as substantiated by the scale tickets from the North 48th Street landfill. All scale tickets shall be promptly provided to the JPA's on-site inspector after delivering the material to the North 48th Street site.

3. Where does the contractor obtain a fugitive dust control permit as outlined in the special provisions under permits and licenses, sheets 9 & 10? What is the cost of this permit?

Response: The Lincoln /Lancaster County Health Department has Air Pollution Regulations that provide requirements for dust control that need to be followed by contractors working on the project. No dust that is generated by the construction activities shall be allowed to migrate off the site onto adjacent properties. This will require the Contractor to provide some means for dust control at the site at all time during the work. These requirements apply to work not only at the Haymarket site but also at any off-site borrow pits where material would be loaded and along any routes used to haul the material to the site. At this time there is not a permit required by this agency for a fugitive dust control permit. The following is a portion of the regulations pertaining to dust control:

SECTION 32. DUST -- DUTY TO PREVENT ESCAPE OF.

(A) Handling, Transportation, Storing. No person may cause or permit the handling, transporting or storage of any material in a manner which may allow particulate matter to become airborne in such quantities and concentrations that it remains visible in the ambient air beyond the premises where it originates.

(B) Construction, Use, Repair, Demolition. No person may cause or permit a building or its appurtenances or a road, or a driveway, or an open area to be constructed, used, repaired or demolished without applying all such reasonable measures to prevent particulate matter from becoming airborne so that it remains visible beyond the premises where it originates. The Director may require such reasonable

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measures as may be necessary to prevent particulate matter from becoming airborne, including but not limited to paving or frequent cleaning of roads, driveways and parking lots; application of dust-free surfaces; application of water; and the planting and maintenance of vegetative ground cover.

(C) Notwithstanding any other provisions of this section, the Department shall not regulate emissions from normal farming practices, farm crop drying and handling, or animal feeding activities, provided that reasonable and practical measures to limit particulate matter from such sources are utilized.

Ref: Title 129, Chapter 32, Nebraska Department of Environmental Quality

4. For line item 164- "Geotextile for subgrade stabiliztion" can you clarify if Mirafi 600 X or BX 1100 is to be used below the rock and what is to be used above the rock? The geotechnical report leaves it up to the contractor based on what size of rock we are using? Please provide a detail section showing what is expected of the contractor for installation for installation of the rock/geogrid & geotextile fabric.

Response: The geotechnical engineering report provides several options for subgrade stabilization that a Contractor could consider using on this grading project. This response to Gana Trucking's question presented above is provided assuming that **Alternative B. Stabilization with a Geotextile and Granular Materials.** is the stabilization method that all Contractors should assume for bidding purposes. The Contractor shall assume that the "Stabilization Material" shall consist of the "well-graded" crushed rock material recommended in **TABLE 9 - GRADATION REQUIREMENTS FOR "WELL-GRADED" STABILIZATION MATERIAL** (i.e., NDOR Foundation Course Mixture) presented on page 14 of Benesch's **December 29, 2010 GEOTECHNICAL ENGINEERING REPORT --- Proposed Arena and Parking Garage; West Haymarket Project; Lincoln, NE.** It shall be assumed that the Contractor will need to place a layer of "geogrid" (either Mirafi BXG11, Tensar BX1100, or industry equivalent) on the grade before placement of the crushed rock stabilization materials. The Contractor shall place the geogrid in accordance with the Geogrid Fabricator's installation and overlapping recommendations. A lift of stabilization rock 12-inches in depth (after compaction) shall be pushed out in advance of light-size construction equipment. The crushed rock stabilization material shall be compacted using light-sized construction equipment and shall at least achieve 98% compaction as determined using ASTM D 698. The Contractor shall assume that the first couple lifts of compacted soil placed atop the crushed rock stabilization material will need to be placed and compacted using the same installation technique discussed above for the crushed rock stabilization material (i.e., by pushing each lift of soil out in front of light-sized construction equipment and compacted using light- to moderate-sized construction equipment). It shall be the total responsibility of the Contractor to select the size of construction equipment that will be required to place and compact the crushed-rock stabilization materials and first several lifts of compacted fill materials while avoiding disturbance of the underlying natural subsurface materials. A layer of "geotextile fabric" (i.e., such as Mirafi 600X, Trevira 011/450, or industry equivalent) will not be required in addition to the geogrid required specified above, given the gradation of the crushed rock stabilization material specified.

5. For line item 160 – "Granular Material for Subgrade Stabilization" will granular material for subgrade stabilization be required to meet table 9 of the geotechnical report? If not give any other acceptable gradation and material specification. Does this rock have to be limestone or can it be crushed concrete? Please provide a detail section showing what is expected of the contractor for installation of the rock/geogrid & geotextile fabric.

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Response: Yes the granular materials for subgrade stabilization will be required to meet the gradation requirements presented in Table 9 of the geotechnical report. The stabilization rock can either be fabricated from limestone or crushed concrete. However, it must be noted that the material utilized to fabricate the stabilization material shall meet the gradation specified in Table 9 of the geotechnical engineering report for the project and shall be clean (i.e., not containing any deleterious-soil materials as specified by the State of Nebraska requirements for NDOR Foundation Course Mixture). The geogrid would be placed on top of the subgrade at the bottom of the over-excavated area and the granular material would be placed above on top of the geogrid. This is fairly straight forward construction and a detailed section is not being provided.

6. Are weather delays considered approved extensions of time when considering liquidated damages? How will the determination be made if weather is deserving of a time extension or not?

Response: The development of the project schedule has been based upon the assumption that typical weather conditions will prevail during the duration of the construction. If weather conditions differ substantially from the average weather conditions per month as determined by the State Climatologist and/or the National Weather Service then consideration will be given for an extension.

7. Can the requirement of re-establishment of the grade if settlement or erosion occurs at the North 48th street site be waived for this project as stated under the N.48th street landfill section of the specification issued in addendum # 1?

Response: No, the Contractor will be required to leave the site in accordance with the lines and grades as shown in the Grading Plan for the North 48th Street Site and per the requirements outlined in the Special Provision for work at the North 48th Street Solid Waste Facility. The Contractor would not be expected to return months after the project had ended to correct deficiencies such as settlement and erosion if the contractor had complied with the specifications during the completion of the work and the JPA had previously accepted the work for final payment.

8. Please clarify that every operator, truck driver, laborer or worker of any type on the West Haymarket Arena site will need to be BNSF E-Rail Safe and has gone through the Contractor Orientation? Please state process and cost associated with obtaining both of these?

Response: All Contractor employees that will be involved with work within the area bounded by the existing BNSF railroad tracks as well as the area at the northeast portion of the site for construction of the temporary road to connect with the new roadway at 8th and "U" Street will need to be certified through the BNSF E-Rail Safe program and shall have the required BNSF Contractor Safety Orientation as outlined in the BNSF Special Provisions. This would include employees working on any utility borings/jacking under the railroad tracks. Contractors employees that are working solely on the pavement reconstruction at "R" Street to the east of the BNSF property would not require these certifications if the Contractor can substantiate that they will not cross onto BNSF owned property during the course of the construction. Refer to the BNSF Special Provision Section 1.02 for the requirements for the Contractor Safety Orientation. Refer to https://www.e-railsafe.com/ev/servlet/hr.utilities.HRInfo for requirements on the BNSF E-Rail Safe certification.

9. What will be expected of the contractor for cleaning of equipment and trucks leaving the N. 48th street or Bluff Road landfill site to abide by specification section- N. 48th street solid waste facility- Beneficial soils and Construction and Demolition Waste Material requirements – Part 1.3- Paragraph

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D subpart 3A. That was issued in addendum # 1.

Response: If the Contractor were to encounter hazardous wastes at the North 48th Street Solid Waste Facility, the minimum requirements for cleaning and decontaminating vehicles and equipment would include, but not be limited to, washing contaminated vehicles and equipment with clean water.

10. Does specification section -N. 48th street solid waste facility- Beneficial soils and Construction and Demolition Waste Material requirements Part 1.5 submittals – apply to this project and will it be required?

Response: Yes. The Contractor will be required to submit the information as outlined in this section to the JPA and the City's Solid Waste Management staff information regarding their proposed work plan for approval. This would include erosion and sediment control, haul routes, traffic control plan, proposed equipment to use in placing and compacting the material, a drawing of the work area as stipulated and a schedule for completing the work at the North 48th Street Solid Waste Facility.

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Contractor Certification of Compliance
NPDES Dewatering Discharge Permit No. NEG671000

In accordance with the provisions of the Federal Water Pollution Control Act (33 U.S.C. § 1251 *et. seq.*, as amended), the Nebraska Environmental Protection Act (Neb. Rev. Stat. § 81-1501 *et. seq.*, as amended), and the Rules and Regulations promulgated thereunder, the West Haymarket Joint Public Agency (JPA) has submitted a site-wide Dewatering Notice of Intent (DW-NOI) for dewatering discharges authorization under the General NPDES Permit NEG671000, attached as Exhibit A and incorporated as if fully set forth herein, for the West Haymarket Redevelopment Site. The JPA is designated as an "Owner" and the Contractor, including any selected subcontractor conducting the dewatering activities, is designated as an "Operator" of the dewatering activity conducted under the permit.

As such, I certify that:

I, or qualified members of my staff, have reviewed and understand the terms and conditions of the NPDES General Permit Number NEG671000 and I understand that the submission of this "Contractor Certification of Compliance" obligates the Contractor as the operator responsible for conducting dewatering activities, to comply with all said terms and conditions of the permit.

_____ _____
Operator's Signature Date

_____
Title

_____
Company

_____
Business Address

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CONTAMINATED SOILS

During the prosecution of the work on this project it is anticipated that the Contractor may encounter some contaminated soils. If contaminated soils are encountered and it is determined that they cannot be used as backfill for the utility trenches or other excavations, then the Contractor shall be required to dispose of the soils offsite in accordance with all Federal, State and Local regulations. No material shall be removed from the site without the approval of the West Haymarket Environmental Team.

The Contractor shall immediately report the discovery of any contaminated soils or potentially contaminated soils to the West Haymarket Environmental Team for resolution on how to manage the soil. Typical indications of potential contaminated soils would include discoloration of the soil or odors associated with soils removed as part of the excavation or trenching work. The Contractor shall temporarily stockpile potential contaminated soils on site as directed by the West Haymarket Environmental Team for further testing to determine the extent of potential contamination and the method for disposal. All excavated soils that may be contaminated shall be kept separated from clean soils encountered during the excavation or trenching work.

During the handling and managing of contaminated soils the Contractor shall comply with all OSHA regulations for worker safety as well as all other Federal, State or Local Health Department requirements.

If analysis of the soil indicates that the contamination is petroleum related and it is determined that the soil can be accepted by the City of Lincoln's Bluff Road Landfill, then the Contractor will be directed by the West Haymarket Environmental Team to haul the material to the Bluff Road Landfill for disposal. Disposal of petroleum contaminated soils shall be measured and paid for by the ton in accordance with the contract bid item "Disposal of Petroleum Contaminated Soil". Said payment shall include all labor, equipment, materials and incidentals required to haul and dispose of the soil at the Bluff Road Landfill including all necessary landfill fees, permits and all other incidental items associated with hauling and disposal of the soil. The Contractor shall provide copies of all load tickets from the landfill to substantiate the quantity of contaminated soil for final payment.

If it is determined that the contaminated soils cannot be disposed of at a the Bluff Road Landfill then disposal of the soil will be paid for on an "Extra Work" Basis based upon the final determination of the disposal site and the associated costs for the hauling, landfill/waste facility fees, permits and other incidental items associated with the disposal of the contaminated soil.

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CHAIN LINK FENCE SWING GATES

The Contractor shall construct galvanized chain link fence swing gates at the locations shown on the plans or as directed by the Engineer. The chain link fence swing gate shall be 8'-0" high and shall have a clear width when opened as shown on the plans. Removal of existing fence and posts along with installation of new gate posts and concrete foundations shall be considered subsidiary to the cost of the chain link fence swing gate. Construction of the chain link fence swing gate shall be completed in accordance with the details shown on the plans and the requirements outlined in Chapter 9.00 of the City of Lincoln Standard Specifications for Municipal Construction. All gates shall be furnished with a locking mechanism and a commercial grade padlock to secure the gate during non-work hours.

Measurement and payment for furnishing and installation of fence gates shall be measured and paid for per each in accordance with the contract bid item "24'-0" Wide Double Swing Gate". Said payment shall be full compensation for furnishing all labor, equipment, materials and incidentals required to install the gates at the locations shown on the plans including removal of existing fence and posts as necessary to complete the installation and in accordance with the requirements outlined in Chapter 9.00 of the City Standard Specifications for Municipal Construction.

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MEETING AGENDA- PRE-BID
West Haymarket Joint Public Agency
Haymarket Infrastructure Improvement
Initial Haymarket Site Preparation – Project 870703
Bid Number 11-079
USPS Parking Lot Reconstruction – Project 870303
Bid Number 11-080

DATE/TIME: April 12, 2011, 1:00 pm - 3:00 pm

LOCATION: City of Lincoln Municipal Services Center, 901 West Bond

I. Project Overviews

A. Initial Site Preparation Project

An overview of the Site Preparation Project was provided. This project will prep the site for the initial arena construction and includes earthwork, site clearing and demolitions and site utility work.

The prospective bidders were referred to Addendum No. 1 which included additional geotechnical information on the stockpiled soils, asbestos reports for the buildings to be demolished as well as revised special provisions for Earthwork Construction and the North 48th Street Work at the Solid Waste Facility. Addendum No. 2 was issued and included the grading plan at the North 48th Street site for beneficial reuse soils and the geotechnical report for the area at the Haymarket site between "O" and "R" Streets. The SWPPP for the North 48th Street site was inadvertently omitted from Addendum No. 2 and it was issued with Addendum No. 3.

Bid Opening Date: 12:00PM, Wednesday, April 20, 2011
Anticipated Notice to Proceed: Monday, May 9, 2011
Davis Bacon Wages Apply

B. USPS Parking Lot Reconstruction

An overview of the USPS Parking Lot Reconstruction was provided. This project will construct a portion of "R" Street between 7th and 8th Street and this project is tied with the Initial Haymarket Site Preparation Project.

Bid Opening Date: 12:00PM, Wednesday, April 20, 2011
Anticipated Notice to Proceed: Tuesday, May 31, 2011

II. Discussions Topics

A. Construction/Contract Phasing

i. Critical Dates

1. NTP: May 9, 2011
The Site Preparation Project is currently on schedule for a NTP on May 9, 2011. This initial work can include site clearing, demolitions, utility work (sanitary and storm sewers) and excavation and over-excavation work at the site. Not off-site fill can be brought in until the Remedial Action Plan (RAP) has been approved by NDEQ. A key item will be jacking the new storm sewer pipes and water main casing under the BNSF tracks.

2. RAP approval, off-site fill can be placed: May 23, 2011

3. BNSF communication tower relocated: June 12, 2011
The Contractor will need to keep the existing overhead BNSF line that runs across the west side of the site to the existing tower in place until the new tower is complete and in operation.

4. Site Project Contract Phase A Completion: September 15, 2011.
This is the substantial completion date for all of the work at the site north of "R" Street where the new arena will be built and includes all work along "R" Street. It is critical that this date is met so as not to delay the overall completion of the arena construction. Substantial liquidated damages will be applied if this completion date is not attained.

5. Site Project Contract Phase B Completion: November 11, 2011
This is the substantial completion date for the remaining site work between "O" and "R" Street.

6. USPS Contract Substantial Completion: September 2, 2011.
This is the substantial completion date for all work associated with the USPS Project and as such the work on

WEST HAYMARKET INFRASTRUCTURE TEAM
1111 LINCOLN MALL | SUITE 111
LINCOLN, NE | 68508

the Site Preparation Project shown in Phase IC would also need to be completed at this time as well.

7. Site Project Final Completion: December 9, 2011

8. USPS Parking Lot Final Completion: October 21, 2011

Several questions were asked regarding the critical dates as follows:

When will the surcharge need to be in place?

Settlement plates will be used and the surcharge will be monitored by the geotechnical engineer to determine when it can be removed. The estimated time for the surcharge to remain in place is 30 days. The Contractor's will need to determine the time required to remove the surcharge and finalize the grading at the arena or District Energy Corp Plant site and back this up from the completion date for the respective phases to determine the critical date for completion of the surcharge.

When can the USPS wall be removed?

The USPS wall is on the Post Office property and is proposed to be removed as part of the USPS Parking Lot Project. The JPA is currently working with the USPS to acquire the property and it is anticipated that this property will not be acquired until the end of May. The anticipated NTP for work at the USPS property is May 31, 2011.

B. Status of Utilities

i. Site Preparation Project

The Site Preparation Project includes sanitary sewer, water main and storm water construction. Construction of the new 60" and 54"storm sewers as well as the 12" sanitary sewer at the northwest corner of the USPS property are critical early items to accommodate grading work at the arena site.

It was noted that the contractor will be required to provide temporary shoring along the BNSF Passenger Mains and the BNSF yard tracks to construct the new sanitary sewer along the future "Q" Street corridor. The contractor is responsible for providing design of the shoring sealed by a licensed engineer for submittal to the BNSF Railway for review and approval. All submittals shall go through Gerald Maczuga the BNSF Project Contact for all Haymarket Projects. The BNSF has a guidance document for shoring design adjacent to their tracks and this will be attached to these meeting minutes. All

requirements outlined in the document must be strictly adhered to unless approved otherwise by the BNSF. The selected contractor shall allow at least 30 days for BNSF review of the shoring calculations.

It was noted that the existing yard tracks along the west side will be removed in approximately 15 months so the BNSF has granted a variance to allow sewer and water main to be bored under these tracks without using casing pipes. A casing pipe is required for the water main that will cross the BNSF Passenger mains.

The prospective bidders shall anticipate that the yard tracks as well as the passenger mains will have trains on them at various times during the construction and a BNSF flagger will need to be present during completion of the work. All of the boring and directional drilling shall be coordinated with the BNSF and their respective flagger.

ii. USPS Parking Lot Reconstruction

LES and Black Hills Energy will be installing new facilities concurrently with the project along the "R" Street corridor between the Haymarket site and 8th Street. The selected contractor will be required to coordinate their work with the public and private utilities.

It was noted that the USPS will most likely be contacting the selected contractor to reconstruct their water service all the way into the building during construction of the project. The work as outlined on the Site Preparation Project calls for a new water service to be constructed from the new main at 7th and "R" Street to the ROW line at the USPS property. This work will be completed during Phase IC of the Site Preparation Project which coincides with Phase I of the USPS Project which covers the western portion of the USPS parking lot.

C. Coordination with Others

The contract special provisions identify a number of different stakeholders that the selected contractor will need to coordinate throughout the project. These include the BNSF (with daily coordination with the on-site BNSF flagman), public/private utilities, the USPS local Postmaster, City Parking (Ken Smith) and the Arena's Construction Manager.

Access to the USPS for customer parking, employee parking and access to the building shall be maintained at all times so the selected contractor will need to schedule their work accordingly.

The selected contractor will be required to enter into an agreement (shown as C-1 in the BNSF requirements included in the Special Provisions) with the BNSF and will need to provide the railroad the required insurance certificate. The City has executed a master agreement with the BNSF that stipulates these requirements need to be included in construction projects where work will cross or fall within BNSF property.

The selected contractor will be required to have all personnel who will work at the Haymarket site to be certified through the BNSF E-rail Safe Program and their Safety Training program. This is required because it will be necessary for workers to cross the BNSF property to access the site. Refer to the BNSF Special Provisions. Workers who will not cross the Passenger mains or enter onto BNSF owned property (workers solely working on the USPS Project and work on "R" Street to east of the BNSF property would not require this training/certification.

D. BNSF Railway Special Provisions

Discussion on this is included in the Coordination Section above.

E. Project Phasing

i. Phase IA Site Project

This includes the initial site clearing, building demolitions, utility construction and excavation/over-excavation work at the area from "R" Street to the north. Critical early work items are the storm sewer construction for the 60", 54", 42" and 24" pipes (this includes the jacked pipes under the BNSF passenger mains) and the reconstruction of the sanitary sewer pipe at the northwest corner of the USPS building. It was noted that the selected contractor will need to schedule the work so that access is provided to the USPS employee parking along the west side of the Post Office building from either the north or the south end (through the City's Iron Horse Parking Lot) at all times.

Initial access to the site will be from 6th and "N" Street. A north access to 8th and "T" Street will be available after May 27, 2011. The primary access point for all loaded trucks will be 6th and N Street. The north access will be limited to unloaded trucks leaving the site unless otherwise approved by the Engineer.

ii. Phase IB Site Project

This phase is generally construction of the fills and surcharge at the arena pad site.

iii. Phase IC Site Project

This includes the Site Preparation Project work in the "R" Street corridor and is to be completed concurrently with work on Phase I for the USPS Project. Need to maintain access to the USPS for customer parking, access to main doors for customers as well as access to USPS drop box at 7th Street at all times.

iv. Phase II Site Project

This will include construction of the remaining portions of the Site Prep Project work between "O" Street and "R" Street. At the completion of the embankment construction a finished crushed rock access road and parking area will be constructed as shown on the plans. It was noted that the crushed rock access roads for the earlier phases will be removed as the new fill and embankment construction work proceeds to the south. The selected contractor may begin work on portions of the Phase II work concurrently with the Phase I work.

v. Phase I and II USPS Parking Lot Project

The USPS Parking Lot Project will generally be constructed in two phases with Phase I being the west portion of the new lot and Phase II the east portion. Phase II will include construction on "R" Street between 7th and 8th Street. There will be a temporary drive constructed at 8th and "S" Street for access into the USPS property during Phase II and the selected contractor will be required to restripe the parking along the east parking area to provide 90 degree stalls.

F. Environmental Requirements

Frank Uhlarik with the West Haymarket Environmental Team provided a synopsis of material; contaminated groundwater, petroleum impacted soil (geotechnically unsuitable) and other environmental concerns at the site. He indicated that pre-screening of the material is being completed to verify where the unsuitable material can be taken. Frank indicated that per their discussions with NDEQ, and the known contamination that may

exist at the site that they need to be able to account for every cubic yard of material removed and where it's going.

i. Environmental Contingency Plan

This plan is included as an attachment to the contract documents. The Contractor shall familiarize themselves with the plan and the requirements. The selected contractor will be required to sign a certification that they are familiar with the requirements outlined in the plan and will follow those requirements during completion of the work.

ii. Dewatering Requirements

It is anticipated that dewatering will be required for portions of the work on the project. All dewatering effluent will need to be containerized and tested prior to discharge. Frank provided some information on the dewatering for the Title 200 Project that is currently being completed. The excavation was approximately 16 foot deep, 200 ft. by 200 ft. and they utilized two 20,000 gallon Baker Tanks to hold the dewatering effluent. He estimated that they had a total of approximately 80,000 gallons. The final disposal of the dewatering effluent went to the sanitary sewer.

A question was asked about storm water/rainfall that would enter the excavations or trenches. Further follow-up with the West Haymarket Environmental Team indicates that any water that is pumped out from an excavated area or trench will need to be containerized and tested to determine the method of disposal. If the groundwater being pumped at the specific location has already been tested and approved by the West Haymarket Environmental team and they have determined that it is acceptable for discharge to either the storm sewer under the site-wide NPDES Dewatering Permit or to the sanitary sewer under their respective limitations than it most likely can be safely assumed that it will only be diluted and they can continue to discharge where they have already been authorized to do so. However, if this authorization has not been provided in advance, the pumped water shall be containerized and tested. It is anticipated that the selected contractor will manage the site to prevent any storm water run-off from entering the excavations or trenches such that any potential storm water that would need to be pumped would be limited to what falls directly on the excavation or trench.

A question was asked regarding the pay items for the containers to temporarily store the dewatering effluent. The bid proposal shows 4 containers which may be required to be on site for the dewatering. Based upon the selected contractor's plan for the work not all 4 containers may be on site at the beginning of the work. In addition to the payment for each container, there is an additional payment per day that the containers are on site. The intent is such that once it is determined that a container is required at the site to support dewatering activities that the container would remain on site until the completion of the work requiring the dewatering. It is anticipated that all work requiring dewatering would be completed by the middle part of September.

iii. Beneficial Reuse Soils

The beneficial reuse soils will come from the excavation of geotechnically unsuitable materials or geotechnically unsuitable stockpiled material.

A question was asked whether this material needed to be stockpiled on site and Frank Uhlarik clarified that the West Haymarket Environmental Team is doing pre-screening of the soils to verify that they can be loaded directly and removed from the site for beneficial reuse. However, the on-site construction representative will closely monitor the soil being removed and anything that looks like it differs from the characteristics of the previously tested soils will need to be stockpiled on site for further testing and determination on disposal method.

It was noted that the name of this pay item was revised as part of the new Earthwork Construction Special Provision included in Addendum No. 1. This was formerly called Excavation – Disposal. The former pay item did not properly describe the actual material and proposed use as beneficial fill and was revised to clarify that this was not waste material.

iv. Other Environmental Discussion/Requirements

There were no other questions on the environmental requirements.

G. Geotechnical Requirements

i. Constructions requirements

The construction requirements and recommendations for the earthwork construction on the project are included in the geotechnical reports which have been attached to the contract documents. These include the report for the arena site, the area between "O" Street and "R" Street and the evaluation of the stockpiled soils to be reused in the embankment construction. The Contractor's will need to familiarize themselves with the information in these reports and the requirements for the earthwork construction. A minimum of 98% of standard proctor density will be required for all earthwork construction on the project (this is greater than that shown in the City Standard Specifications).

ii. Over-excavation work

This is the work associated with removal and reworking of the subgrade soils below the layer of unsuitable soils that is proposed to be removed for beneficial reuse soils. The selected contractor will be required to amend these soils as required to attain the proper moisture content to achieve the desired compaction.

iii. Subgrade Stabilization

This includes work involved with stabilizing the subgrade at the bottom of the over-excavation work. It involves placement of a geotextile overlaid with a layer of granular material as specified in the geotechnical report. It was assumed that approximately 20 percent of the area below the over-excavation work will need to be stabilized.

iv. Stockpiled Soils for Reuse

Goal is to reuse as much of this material as possible, realizing some may not be suitable from a geotechnical perspective.

v. Surcharge Embankments and reuse

Intent is to reuse surcharge material as part of the fills and embankment construction for the Phase II work. We do not want to bring off-site soils onto the site and then have to haul

them off. Any soil that we bring in would have to be tested if it was going to be hauled back off the site.

H. Questions

What is the last day for questions?

All questions should be sent to the Purchasing Agent by Thursday, April 14, 2011 at 4:00 pm.

How will measurement of the various earthwork quantities be controlled?

The quantities for the Excavation of Beneficial Reuse Soils and Over-excavation have been based upon the recommended depths provided at the various boring locations and the associated lines developed from these depths as shown on the cross sections. If during the course of the work the field representative identifies the need to adjust these depths, the changes will be noted on the cross sections and these will be used for determination of the final pay quantities. The stockpiled soils will be cross sectioned before and after to determine these quantities. The earthwork measured in embankment will be adjusted accordingly based upon any field changes to the depths and lines shown for the Excavation of Beneficial Reuse Soils or Over-excavation as made by the JPA's field representatives.

Is the volume shown for the stockpile a loose yard count and how was this established?

The stockpile volume was estimated based upon the grading plans that were completed for the BNSF Railroad Track Relocation Project. This volume is a loose yard count and does not take into consideration a compaction factor. Refer to the plans and special provisions for the assumed compaction factor that was applied to these soils to determine the in-place volume. As noted earlier the stockpiles will be cross sectioned before and after to determine the actual volume of soil used.

There was also a clarification regarding all excavation work and the monitoring of all beneficial reuse soils. The JPA will have on-site construction observation staff to monitor all material be excavated or removed from the site for beneficial reuse at the North 48th Street Solid Waste Facility to ensure that the material meets the requirements outlined for the beneficial reuse soils.

WEST HAYMARKET INFRASTRUCTURE TEAM
1111 LINCOLN MALL | SUITE 111
LINCOLN, NE | 68508

Type and/or Topic

Date: Annual Meeting

Location

Chair (Staff Representative)

Secretary

MEETING ATTENDANCE

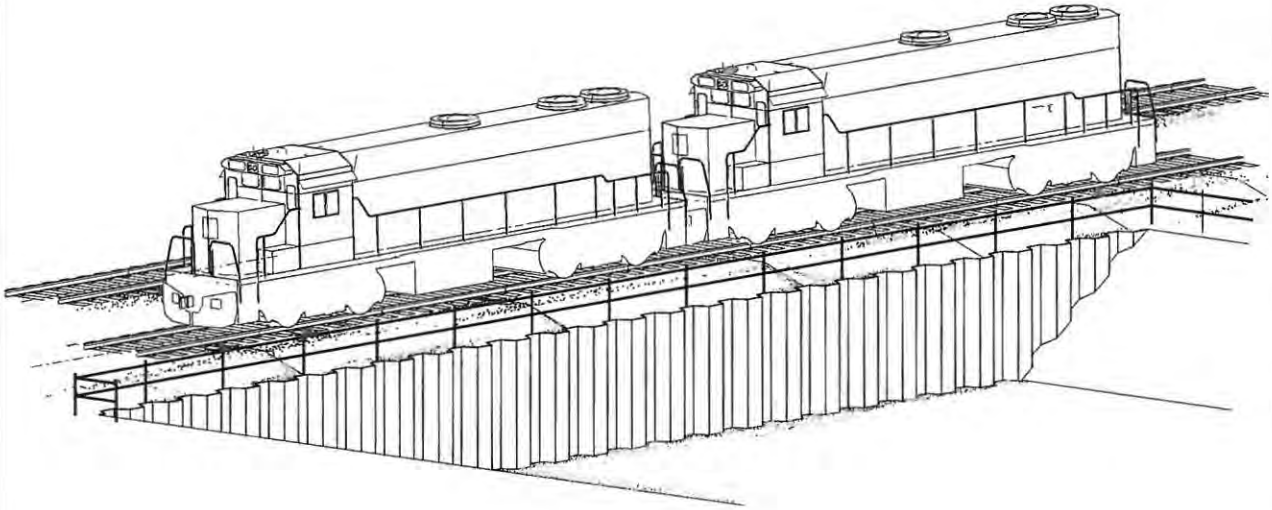
Type/Board or Topic:

Date & Time of Meeting:

Chair/Staff Representative:

Location:

GUIDELINES FOR TEMPORARY SHORING



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GUIDELINES FOR TEMPORARY SHORING

1. SCOPE

The scope of these guidelines is to inform public agencies, design engineers, contractors and inspectors of current Railroad standards and requirements concerning design and construction of temporary shoring.

1. The term **Railroad** refers to the Burlington Northern & Santa Fe Railway (BNSF) and/or the Union Pacific Railroad (UPRR). The term **Contractor** is defined as any party gaining access to work on Railroad right-of-way or other Railroad operating locations.

2. These guidelines are provided as a reference and may not be taken as authority to construct without prior review and written approval of the Railroad. These guidelines supersede all previous guidelines for temporary shoring and are subject to revision without notice.

3. These guidelines supplement the current, American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual of Recommended Practice. The 2002 AREMA Manual was utilized in developing this guideline. The AREMA Manual is available from:

   American Railway Engineering and Maintenance-of-Way Association
   8201 Corporate Drive, Suite 1125
   Landover, MD 20785-2230
   Phone: (301) 459-3200
   FAX: (301) 459-8077
   www.arema.org

4. The specific requirements for temporary shoring addressed in this document shall be followed for all locations where the Railroad operates, regardless of track ownership.

5. Any items not covered specifically herein shall be in accordance with the AREMA Manual and subject to the review and approval of the Railroad. Where conflicts exist, the most stringent specification should be applied.

6. All excavations shall also be governed by Railroad requirements, Federal, State and Local laws, rules, and regulations concerning construction safety.

7. Safe rail operations shall be required for the duration of the project. All personnel, railroad tracks and property shall be protected at all times.

8. To expedite the review process of the temporary shoring plans, drawings submitted by the Contractors are required to adhere to the project specifications, AREMA and other Railroad requirements.

2. GENERAL CRITERIA

The Contractor must not begin construction of any component of the shoring system affecting the Railroad right-of-way until written Railroad approval has been received.

1. All excavations shall be in compliance with applicable OSHA regulations and shall be shored where there is any danger to tracks, structures or personnel regardless of depth.

2. The Contractor is responsible for planning and executing all procedures necessary to construct, maintain and remove the temporary shoring system in a safe and controlled manner.

3. Emergency Railroad phone numbers are to be obtained from the Railroad representative in charge of the project prior to the start of any work and shall be posted at the job site.

4. The Contractor must obtain a valid right of entry permit from the Railroad and comply with all Railroad requirements when working on Railroad property.

5. The Contractor is required to meet minimum safety standards as defined by the Railroad.

6. All temporary shoring systems that support or impact the Railroad's tracks or operations shall be designed and constructed to provide safe and adequate rigidity.

7. The Railroad requirements, construction submittal review times and review criteria should be discussed at the pre-construction meeting with the Contractor.

8. A flagman is required when any work is performed within 25 feet of track centerline. If the Railroad provides flagging or other services, the Contractor shall not be relieved of any responsibilities or liabilities as set forth in any document authorizing the work. No work is allowed within 50 feet of track centerline when a train passes the work site and all personnel must clear the area within 25 feet of track centerline and secure all equipment when trains are present.

9. Appropriate measures for the installation and protection of fiber optic cables shall be addressed in the plans and contract documents. For specific Railroad requirements and additional information refer to:

   www.bnsf.com or call 1-800-533-2891.

   www.uprr.com, call 1-800-336-9193 or refer to UPRR Fiber Optic Engineering, Construction and Maintenance Standards.

10. Relocation of utilities or communication lines not owned by the Railroad shall be coordinated with the utility owners. The utility relocation plans must then be submitted to the Railroad utility representative for approval. The shoring plans must include the correct contact for the Railroad, State or Local utility locating service provider. The Railroad will not be responsible for cost associated with any utility, signal, or communication line relocation or adjustments.

3. CONTRACTOR RESPONSIBILITIES

The Contractor shall be solely responsible for the design, construction and performance of the temporary structure. **(AREMA 8.28.1.3)**

1. The Contractor's work shall in no way impede the train operations of the Railroad and must be coordinated with the local Railroad operating department.

2. The Contractor shall develop a work plan that enables the track(s) to remain open to train traffic at all times.

3. The Contractor shall comply with all State and Federal Laws, county or municipal ordinances and regulations which in any manner affect the work.

4. All removed soils will become the responsibility of the Contractor and shall be disposed of outside the Railroad right-of-way according to the applicable Federal, State and Local regulations.

5. The Project Engineer and the Contractor shall evaluate the quality of materials furnished and work performed.

6. The Contractor is responsible to protect the Railroad ballast and subballast from contamination.

7. The Contractor must monitor and record top of rail elevations and track alignment for the duration of the project. The movement shall be within the limits defined in **Table 1, Deflection Criteria** on page 10. Displacements exceeding the limits defined in **Table 1** must be immediately reported to the Railroad. All work on the project must stop and the Railroad may take any action necessary to ensure safe passage of trains. The Contractor must immediately submit a corrective action plan to the Railroad for review and approval. The Railroad must review and approve the proposed repair procedure. The repair must be inspected by the Railroad before the track can be placed back in service.

8. Any damage to Railroad property such as track, signal equipment or structure could result in a train derailment. All damage must be reported immediately to the Railroad representative in charge of the project and to the Railroad Manager of Track Maintenance (MTM).

4. INFORMATION REQUIRED

Plans and calculations shall be submitted, signed and stamped by a Registered Professional Engineer familiar with Railroad loadings and who is licensed in the state where the shoring system is intended for use. Shoring design plans and calculations shall be in English units. If Metric units are used, all controlling dimensions, elevations, design criteria assumptions, and material stresses shall be expressed in dual units, with English units to be in parentheses. Information shall be assembled concerning right-of-way boundary, clearances, proposed grades of tracks and roads, and all other factors that may influence the controlling dimensions of the proposed shoring system. See section 10 for additional requirements.

1. Field Survey.

   Sufficient information shall be shown on the plans in the form of profiles, cross sections and topographical maps to determine general design and structural requirements. Field survey information of critical or key dimensions shall be referenced to the centerline of track(s) and top of rail elevations. Existing and proposed grades and alignment of tracks and roads shall be indicated together with a record of controlling elevation of water surfaces or ground water. Show the location of existing/proposed utilities and construction history of the area which might hamper proper installation of the piling, soldier beams, or ground anchors.

2. Geotechnical Report shall provide:
   a. Elevation and location of soil boring in reference to the track(s) centerline and top of rail elevations.
   b. Classification of all soils encountered.
   c. Internal angle of soil friction.
   d. Dry and wet unit weights of soil.
   e. Active and passive soil coefficients, pressure diagram for multiple soil strata.
   f. Bearing capacity and unconfined compression strength of soil.
   g. Backfill and compaction recommendations.
   h. Optimum moisture content of fill material.
   i. Maximum density of fill material.
   j. Minimum recommended factor of safety.
   k. Water table elevation on both sides of the shoring system.
   l. Dewatering wells and proposed flownets or zones of influence.
   m. In seismic areas, evaluation of liquefaction potential of various soil strata.

3. Loads.

All design criteria, temporary and permanent loading must be clearly stated in the design calculations and on the contract and record plans. Temporary loads include, but are not limited to: construction equipment, construction materials and lower water levels adjoining the bulkhead causing unbalanced hydrostatic pressure. Permanent loads include, but are not limited to: future grading and paving, Railroads or highways, structures, material storage piles, snow and earthquake. The allowable live load after construction should be clearly shown in the plans and painted on the pavements behind the bulkheads or shown on signs at the site and also recorded on the record plans. Some of the loads are:

a. Live load pressure due to E80 loading for track parallel to shoring system.
b. Live load pressure due to E80 loading for track at right angle to shoring system.
c. Other live loads.
d. Active earth pressure due to soil.
e. Passive earth pressure due to soil.
f. Active earth pressure due to surcharge loads.
g. Active pressure due to sloped embankment.
h. Dead load.
i. Buoyancy.
j. Longitudinal force from live load.
k. Centrifugal forces.
l. Shrinkage.
m. Temperature.
n. Earthquake.
o. Stream flow pressure.
p. Ice pressure.

4. Drainage. **(AREMA 8.20.2.4)**

   a. The drainage pattern of the site before and after construction should be analyzed and adequate drainage provisions should be incorporated into the plans and specifications. Consideration should be given to groundwater as well as surface drainage.

   b. Drainage provisions for backfill should be compatible with the assumed water conditions in design.

5. Structural design calculations.

   a. List all assumptions used to design the temporary shoring system.

   b. Determine E80 live load lateral pressure using the Boussinesq strip load equation. See **Figure 2** which illustrates Plan Number **710001 "LIVE LOAD PRESSURE DUE TO COOPER E80"**.

   c. Computerized calculations and programs must clearly indicate the input and output data. List all equations used in determining the output.

   d. Example calculations with values must be provided to support computerized output and match the calculated computer result.

   e. Provide a simple free body diagram showing all controlling dimensions and applied loads on the temporary shoring system.

   f. Calculated lateral deflections of the shoring and effects to the rail system must be included. See section 8, Part 6. Include the elastic deflection of the wall as well as the deflection due to the passive deflection of the resisting soil mass.

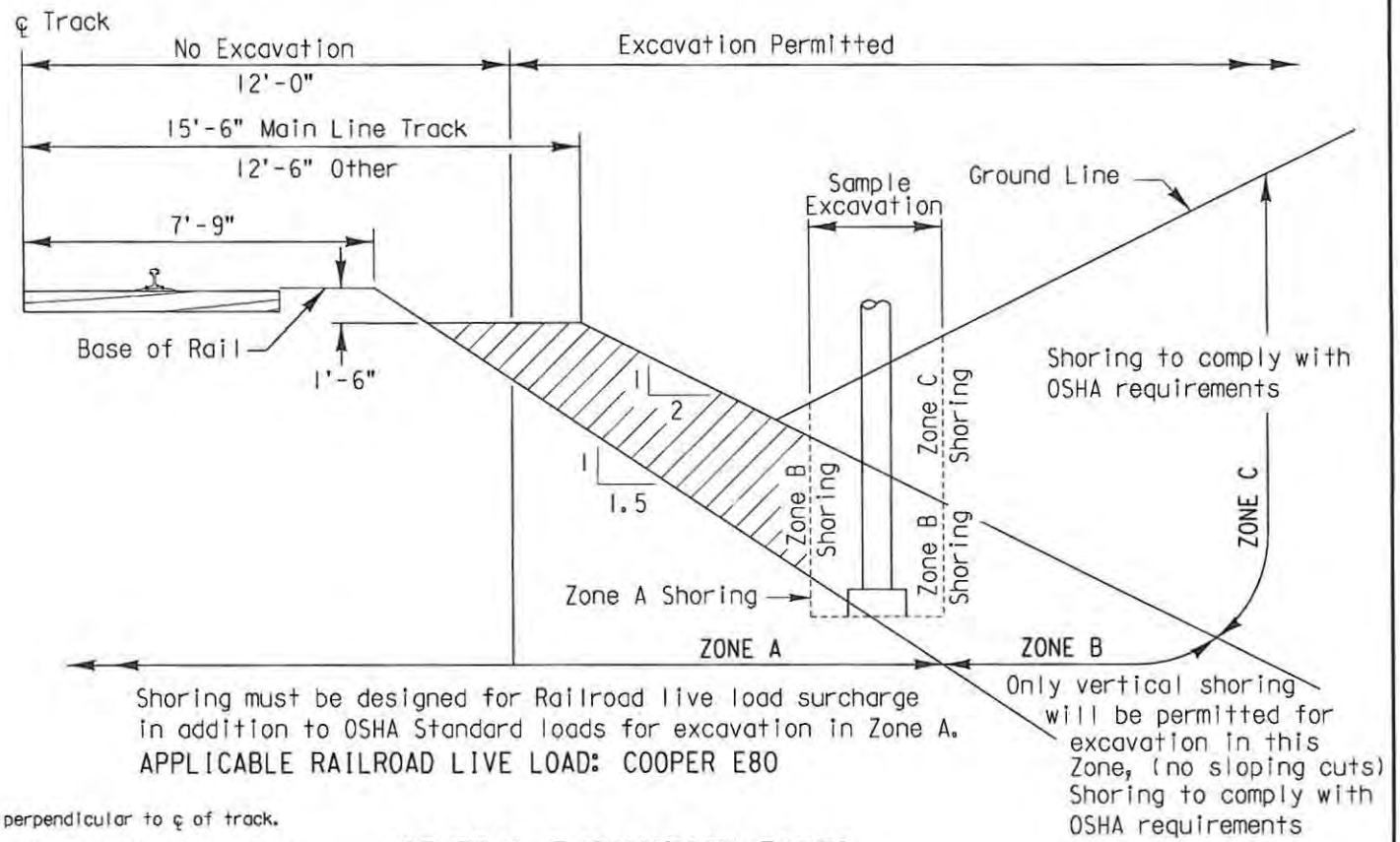
   g. Documents and manufacturer's recommendations which support the design assumptions must be included with the calculations.

5. TYPES OF TEMPORARY SHORING

1. A shoring box is a prefabricated shoring system which is installed as the excavation progresses. This shoring system is not accepted by the Railroad. This system is allowed in special applications only, typically where Railroad live load surcharge is not present. The shoring box is moved down into the excavation by gravity or by applying vertical loading from excavation equipment.
2. Anchored systems with tiebacks are discouraged. The tiebacks will be an obstruction to future utility installations and may also damage existing utilities. Tiebacks must be removed per Railroad direction. Removal of tieback assemblies is problematic.
3. An anchored sheet pile wall is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the sheet pile is embedded and the tensile resistance of the anchors.
   a. For purposes of these guidelines, ground anchors shall be cement-grouted tiebacks designed, furnished, installed, tested and stressed in accordance with the project specifications and AREMA requirements.
4. An anchored soldier beam with lagging wall is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the soldier beam is embedded and from the tensile resistance of the ground anchors.
   a. Anchored soldier beam with lagging walls are generally designed as flexible structures which have sufficient lateral movement to mobilize active earth pressures and a portion of the passive pressure.
   b. For purposes of these specifications, soldier beams include steel H-piles, wide flange sections or other fabricated sections that are driven or set in drilled holes. Lagging refers to the members spanning between soldier beams.
5. A cantilever sheet pile wall is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the sheet pile is embedded. If cantilever sheet pile is used for shoring adjacent to an operating track, the shoring system shall be at least 12'-0" away from the centerline of track. Cantilever sheet pile walls shall be used only in granular soils or stiff clays.
6. A cantilever soldier beam with lagging wall is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the soldier beam is embedded.
7. A braced excavation is a structure designed to provide lateral support for a soil mass and derives stability from passive resistance of the soil in which the vertical members are embedded and from the structural capacity of the bracing members.
   a. For purposes of these guidelines, the vertical members of the braced excavation system include steel sheet piling or soldier beams comprised of steel H-piles, wide flange sections, or other fabricated sections that are driven or installed in drilled holes. Wales are horizontal structural members designed to transfer lateral loads from the vertical members to the struts. Struts are structural compression members that support the lateral loads from the wales.
8. A cofferdam is an enclosed temporary structure used to keep water and soil out of an excavation for a permanent structure such as a bridge pier or abutment or similar structure. Cofferdams may be constructed of timber, steel, concrete or a combination of these. These guidelines consider cofferdams primarily constructed with steel sheet piles.

6. GENERAL SHORING REQUIREMENTS

For general shoring requirements and specific applications of the following items refer to **Figure 1** on the next page which illustrates Plan Number **710000 "GENERAL SHORING REQUIREMENTS"**.



GENERAL NOTES:

All dimensions are measured perpendicular to ℄ of track.

Prior to commencing any work, the contractor shall submit for approval by the Railroad detailed plans indicating the nature and extent of the track protection shoring proposed. The contractor shall install the temporary shoring system per the approved plans. Design of the temporary shoring system to comply with **GUIDELINES FOR TEMPORARY SHORING.**

For excavations which encroach into zone A or B, shoring plans shall be accompanied by design calculations. Plans and calculations must be signed and stamped by a Professional Engineer registered in the state where the work will be performed.

GENERAL EXCAVATION ZONES

SCALE: (NOT TO SCALE)

REVISIONS		
DATE	LTR.	DESCRIPTION
5/03	1	FORMERLY UPRR C.E. 106613
/		
/		
/		
/		
/		

DESIGN BY: PGP | DRAWN BY: JFS | CHECKED BY: AA

APPROVED:

K.H. Jennison

BNSF - ASSISTANT DIRECTOR STRUCTURES DESIGN

George J. Mayer 9-1-04

UPRR - MGR SPECIAL PROJECTS STRUCTURES DESIGN

BRIDGE STANDARDS

GENERAL SHORING REQUIREMENTS

FILE OWNER: UPRR | DATE: 5-8-03

PLAN NO.: 710000 | SHEET: 1 OF 1

PLOTTED: $$$$DATE$$$ $TIME

Figure 1

1. No excavation shall be permitted closer than 12'-0" measured at a right angle from the centerline of track to the trackside of shoring system. If existing conditions preclude the installation of shoring at the required minimum distance, the shifting of tracks or temporary removal of tracks shall be investigated prior to any approval. All costs associated with track shifting or traffic interruption shall be at Contractor's expense.

2. Evaluate slope and stability conditions to ensure the Railroad embankment will not be adversely affected. Local and global stability conditions must also be evaluated.

3. All shoring within the limits of Zone A or Zone B must be placed prior to the start of excavation.

4. Lateral clearances must provide sufficient space for construction of the required ditches parallel to the standard roadbed section. The size of ditches will vary depending upon the flow and terrain and should be designed accordingly.

5. The shoring system must be designed to support the theoretical embankment shown for zones A and B.

6. Any excavation, holes or trenches on the Railroad property shall be covered, guarded and/or protected. Handrails, fence, or other barrier methods must meet OSHA and FRA requirements. Temporary lighting may also be required by the Railroad to identify tripping hazards to train crewmen and other Railroad personnel.

7. The most stringent project specifications of the Public Utilities Commission Orders, Department of Industrial Safety, OSHA, FRA, AREMA, BNSF, UPRR or other governmental agencies shall be used.

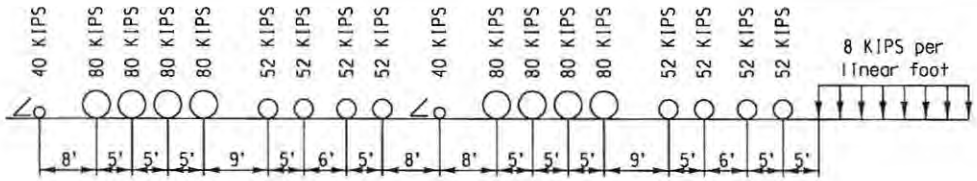
8. Secondhand material is not acceptable unless the Engineer of Record submits a full inspection report which verifies the material properties and condition of the secondhand material. The report must be signed and sealed by the Engineer of Record.

9. All components of the shoring system are to be removed when the shoring is no longer needed. All voids must be filled and drainage facilities restored. See compaction requirements section 9, Part 4.

10. Slurry type materials are not acceptable as fill for soldier piles in drilled holes. Concrete and flowable backfill may prevent removal of the shoring system. Use compacted peagravel material.

7. COMPUTATION OF APPLIED FORCES

1. Railroad live load and lateral forces.
   a. For specific applications of the Coopers E80 live load refer to **Figure 2** on the next page which illustrates Plan Number **710001 "LIVE LOAD PRESSURE DUE TO COOPER E80"**. Supplemental information and sample calculations are provided in the Appendix pages A-1 through A-4.
2. Dead load.
   a. Spoil pile: must be included assuming a minimum height of two feet of soil adjacent to the excavation.
   b. Track: use 200 lbs/linear ft for rails, inside guardrails and fasteners.
   c. Roadbed: ballast, including track ties, use 120 lb per cubic foot.



COOPER E80 LOAD

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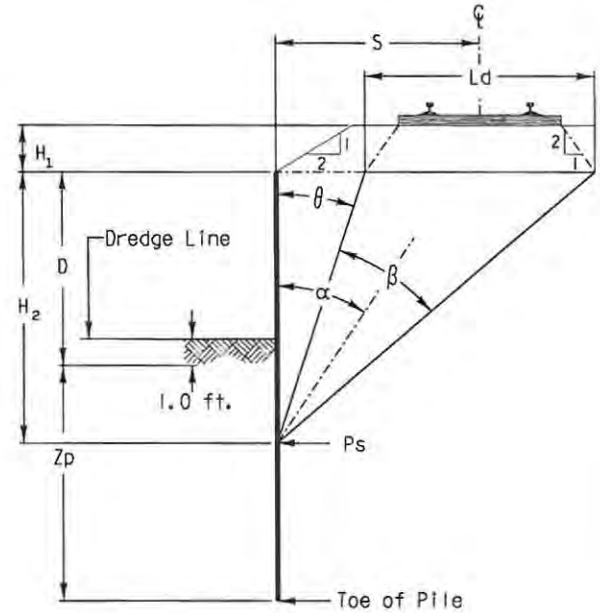

PLAN

SCALE: (NOT TO SCALE)

Vertical pressure q shall be based on a distribution width Ld.
Ld is the length of tie plus H_1.
H_1 is the height from the bottom of tie to the top of shoring.
H_2 is the depth of point being evaluated with the Boussinesq equation.
S is a distance perpendicular from centerline of track to the face of shoring.
D is from top of shoring to one foot below dredge line.
Zp is the minimum embedment depth.
Length of tie is 9 feet
q is the intensity of strip load due to E80 Railroad live load and shall be calculated as follows:

For $H_1 = 0$ Ld = length of tie; therefore, $q = \frac{80{,}000 \text{ lb}}{(5 \text{ feet})(9 \text{ feet})} = 1{,}778$ psf

For $H_1 > 0$ Ld = length of tie + H_1; therefore, $q = \frac{80{,}000 \text{ lb}}{(5 \text{ feet})(Ld)}$

CASE 1: Lateral live load pressure Ps, due to E80 loading for track **parallel** to shoring system is calculated using the Boussinesq Strip Load Equation.

$$Ps = \frac{2q}{\pi}(\beta + \sin\beta \sin^2\alpha - \sin\beta\cos^2\alpha)$$

The above equation can be simplified into the following equivalent form:

$$Ps = \frac{2q}{\pi}[\beta - \sin\beta\cos(2\alpha)]$$

α and β are angles measured in radians, $\alpha = \theta + \frac{\beta}{2}$

CASE 2: Live load pressure due to E80 loading for track at a **right angle** to the shoring system can be calcuated using the following equation.

$$Ps = K_A q$$

where $K_A = \tan^2(45 - \frac{\phi}{2})$

ϕ is the angle of internal friction in degrees

REVISIONS		
DATE	LTR.	DESCRIPTION
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DESIGN BY: PGP | DRAWN BY: JFS | CHECKED BY: AA

APPROVED:

K.H. Jennison

BNSF - ASSISTANT DIRECTOR STRUCTURES DESIGN

George O. Mayer 9-1-04

UPRR - MGR SPECIAL PROJECTS STRUCTURES DESIGN

BRIDGE SHORING STANDARDS

LIVE LOAD PRESSURE DUE TO COOPER E80

FILE OWNER: UPRR | DATE:

PLAN NO.: 710001 | SHEET: 1 OF 1

PLOTTED: $$$$DATE$$$ $TIME

Figure 2

3. Active earth pressure.

   a. The active earth pressure due to the soil may be computed by the Coulomb Theory or other approved method.

   b. The active earth pressure at depth "z_a" is:

   $P_A = K_A \gamma z_a$, where $K_A = \tan^2(45 - \frac{\varphi}{2})$

   z_a = depth of soil influencing the active pressure.

4. Active earth pressure due to unbalanced water pressure.

   a. When bulkheads are used for waterfront construction, the bulkhead is subjected to a maximum earth pressure at the low water stage. During a rainstorm or a rapidly receding high water, the water level behind the bulkhead may be several feet higher than in front of the bulkhead.

   b. Drained conditions in backfill apply when clean sand or clean sand and gravel are used and adequate permanent drainage outlets are provided. Where drained conditions exist, the design water level may be assumed at the drainage outlet elevation.

5. Active earth pressure due to surcharge load.

   The active earth pressure due to surcharge load q':

   $P_U = K_A q'$, where $K_A = \tan^2(45 - \frac{\phi}{2})$

6. Passive earth pressure.

   The passive earth pressure, P_p, in front of the bulkhead may also be computed by the Coulomb Theory.

   $P_p = K_p \gamma z_p$, where $K_P = \tan^2(45 + \frac{\varphi}{2})$

   z_p = vertical distance beginning one foot below dredge line but not to exceed embedment depth

7. Pressure due to embankment surcharges.

   Conventional analysis (Rankine, Coulomb, or Log-Spiral) should be used to determine the additional surcharge from embankment slopes.

8. Additional analysis for centrifugal force calculations as described in **AREMA Chapter 15, Part 1, Section 1.3, Article 1.3.6** Centrifugal Loads are required where track curvature exceeds three degrees.

9. Include and compute all other loads that are impacting the shoring system such as a typical Railroad service vehicle (HS-20 truck).

8. STRUCTURAL INTEGRITY

Structures and structural members shall be designed to have design strengths at all sections at least equal to the required strengths calculated for the loads and forces in such combinations as stipulated in **AREMA Chapter 8 Part 2 Article 2.2.4b**, which represents various combinations of loads and forces to which a structure may be subjected. Each part of the structure shall be proportioned for the group loads that are applicable, and the maximum design required shall be used.

1. Embedment depth.

   a. Calculated depth of embedment is the embedment depth required to maintain static equilibrium.

b. Minimum depth of embedment is the total depth of embedment required to provide static equilibrium plus additional embedment due to the minimum factor of safety.

   1. Embedment depth factor of safety for well-defined loading conditions and thoroughly determined soil parameters is generally 1.3 for most temporary shoring systems. (See **AREMA 8.20.4.1.c**)

   2. All anchored shoring systems require a minimum embedment depth of 1.5 times the calculated depth of embedment. Shallow penetration into strong soil layers is not acceptable. (See **AREMA 8.20.5.1**)

2. The allowable stresses based on AREMA requirements are as follows:

   Structural Steel: 0.55Fy for Compression in extreme fiber. **(AREMA Ch.15 Table 1-11)**

   Structural Steel: 0.35Fy for Shear. **(AREMA Ch.15 Table 1-11)**

   Sheet Pile Sections: 2/3 of yield strength for steel. **(AREMA 8.20.5.7)**

   Concrete: 1/3 of Compressive strength. **(AREMA 8.20.5.7)**

   Anchor Rods: 1/2 of yield strength for steel. **(AREMA 8.20.5.7)**

3. AISC allowances for increasing allowable stress due to temporary loading conditions are not acceptable.

4. Gravity type temporary shoring systems must also be analyzed for overturning, sliding and global stability.

5. The contractor is responsible for providing an approved test method to verify the capacity of anchored or tieback systems. The manufacturers recommendations for testing must be satisfied. Systems which support the Railroad embankment will be considered high risk in determining the percentage of elements to be proof tested.

6. Calculated deflections of temporary shoring system and top of rail elevation shall not exceed the criteria outlined in **Table 1 Deflection Criteria**.

Table 1 Deflection Criteria

Horizontal distance from shoring to track C/L measured at a right angle from track	Maximum horizontal movement of shoring system	Maximum acceptable horizontal or vertical movement of rail
12' < S < 18'	3/8"	1/4"
18' < S < 24'	1/2"	1/4"

9. SOIL CHARACTERISTICS

1. Subsurface Exploration. **(AREMA 8.5.2.2)**

   a. Sufficient borings shall be made along the length of the structure to determine, with a reasonable degree of certainty, the subsurface conditions. Irregularities found during the initial soil boring program may dictate that additional borings be taken.

   b. The subsurface investigation shall be made in accordance with the provisions of **AREMA Chapter 8 Part 22, Geotechnical Subsurface Investigation**.

2. Type of backfill.

   a. Backfill is defined as material behind the wall, whether undisturbed ground or fill, that contributes to the pressure against the wall.

b. The backfill shall be investigated and classified with reference to the soil types described in **AREMA Table 8-5-1**.

c. Types 4 and 5 backfill shall be used only with the permission of the Engineer. In all cases the wall design shall be based on the type of backfill used.

Table 8-5-1 (AREMA) Types of Backfill for Retaining Walls

Backfill Type	Backfill Description
1	Coarse-grained soil without admixture of fine soil particles, very free-draining (clean sand, gravel or broken stone).
2	Coarse-grained soil of low permeability due to admixture of particles of silt size.
3	Fine silty sand; granular materials with conspicuous clay content; or residual soil with stones.
4	Soft or very soft clay, organic silt; or soft silty clay.
5	Medium or stiff clay that may be placed in such a way that a negligible amount of water will enter the spaces between the chunks during floods or heavy rains.

3. Computation of backfill pressure. **(AREMA 8.5.3.2a)**

a. Values of the unit weight, cohesion, and angle of internal friction of the backfill material shall be determined directly by means of soil tests or, if the expense of such tests is not justifiable, by means of **AREMA Table 8-5-2** referring to the soil types defined in **AREMA Table 8-5-1**. Unless the minimum cohesive strength of the backfill material can be evaluated reliably, the cohesion shall be neglected and only the internal friction considered. See Appendix page A-6 for AREMA generic soil properties.

Table 8-5-2 (AREMA) Properties of Backfill Materials

Type of Backfill	Unit Weight Lb. Per Cu. Ft.	Cohesion "c"	Angle of Internal Friction
1	105	0	33°-42°(38°for broken stone)
2	110	0	30°
3	125	0	28°
4	100	0	0°
5	120	240	0°

4. Compaction.

a. The backfill shall preferably be placed in loose layers not to exceed 8 inches in thickness. Each layer shall be compacted before placing the next, but over compaction shall be avoided.

b. It is required that backfill be compacted to no less than 95% of maximum dry density at a moisture content within 2% of optimum and tested using Modified Proctor ASTM D1557.

c. Fill within 100 feet of bridge ends or 20 feet outside culverts shall be placed and compacted to not less than 100% of maximum.

d. No dumping of backfill material shall be permitted in such a way that the successive layers slope downward toward the wall. The layers shall be horizontal or shall slope downward away from the wall.

10. PLANS

The shoring plans must completely identify the site constraints and the shoring system. Use the design templates provided in the appendix as an example to show the required information, specifications and drawings. The specific requirements of the plan submittals are as follows:

1. General plan view should show:
   a. Railroad right-of-way and North arrow.
   b. Position of all Railroad tracks and identify each track as mainline, siding, spur, etc.
   c. Spacing between all existing tracks.
   d. Location of all access roadways, drainage ditches and direction of flow.
   e. Footprint of proposed structure, proposed shoring system and any existing structures if applicable.
   f. Proposed horizontal construction clearances. The minimum allowable is 12 feet measured at a right angle from centerline of track.
   g. Location of existing and proposed utilities.
   h. Drawings must be signed and stamped by a Licensed Professional Engineer, registered in the state where the work will be performed.
   i. Railroad and other "CALL BEFORE YOU DIG" numbers.
   j. Detailed view of shoring along with controlling elevations and dimensions.
2. Typical section and elevation should show:
   a. Top of rail elevations for all tracks.
   b. Offset from the face of shoring system to the centerline of all tracks at all changes in horizontal alignment.
   c. All structural components, controlling elevations and dimensions of shoring system.
   d. All drainage ditches and controlling dimensions.
   e. All slopes, existing structures and other facilities which may surcharge the shoring system.
   f. Location of all existing and proposed utilities.
   g. Total depth of shoring system.
3. General criteria
   a. Design loads to be based on the AREMA manual and Cooper E80 loading.
   b. Pressure due to embankment surcharges.
   c. ASTM designation and yield strength for each material.
   d. Maximum allowable bending stress for structural steel is 0.55Fy.
   e. Temporary overstress allowances are not acceptable.
   f. All timber members shall be Douglas Fir grade 2 or better.
   g. Insitu soil classification.
   h. Backfill soil classification.
   i. Internal angle of friction and unit weight of the soil.
   j. Active and passive soil coefficients.
   k. Fill within 100 feet of bridge ends or 20 feet outside culverts shall be placed and compacted to a minimum of 100% of maximum dry density tested per Modified Proctor ASTM D1557.
   l. Slopes without shoring shall not be steeper than 2 horizontal to 1 vertical

m. Dredge line elevation.

n. Shoring deflection to be calculated and meet Railroad requirements.

4. Miscellaneous:

a. Project name, location, GPS coordinates, track owner, Railroad line segment, milepost and subdivision in the title block.

b. Procedure outlining the installation and removal of the temporary shoring system.

c. General notes specifying material requirements, design data, details, dimensions, cross-sections, sequence of construction etc.

d. A description of the tieback installation including drilling, grouting, stressing information and testing procedures, anchor capacity, type of tendon, anchorage hardware, minimum unbonded lengths, minimum anchor lengths, angle of installation, tieback locations and spacing.

e. All details for construction of drainage facilities associated with the shoring system shall be clearly indicated.

f. Details and descriptions of all shoring system members and connection details.

g. Settlement and displacement calculations.

h. Handrail and protective fence details along the excavation.

i. Drawings must be signed and stamped by a Licensed Professional Engineer, registered in the state where the work will be performed.

j. Call before you dig number.

k. Construction clearance diagram.

11. SUBMITTALS

The Contractor will be responsible for any and all cost associated with the review of plans by the Railroad. Review of design submittals by the Railroad will require a minimum of four (4) weeks. To avoid impacting the construction schedule, the Contractor must schedule submittals well in advance. Partial, incomplete or inadequate designs will be rejected, thus delaying the approval. Revised submittals will follow the same procedure as the initial submittal until all issues are resolved. Submit a minimum of three sets of shoring plans and two sets of calculations with manufacturers' specifications. Drawings and calculations must be signed and stamped by a Registered Professional Engineer familiar with Railway loadings and who is licensed in the state where the shoring system is intended for use. Drawings accompanying the shoring plans shall be submitted on 11" x 17" or 8½" x 11" sized paper.

1. Contractor review.

The Contractor must review the temporary shoring plans to ensure that the proposed method of construction is compatible with the existing site and soil conditions. The Contractor's work plan must be developed to allow train traffic to remain in service. Removal of the shoring system must also be addressed.

2. Applicant and or Engineer of Record review.

The applicant and or Engineer of Record must review and approve the submittal for compliance with the project specifications, AREMA Manual, these guidelines and structural capacity before forwarding the submittal to the Railroad.

3. Review process.

All design submittals shall be forwarded to the Railroad Representative who will send them to the Structures Design Department. The Structures Design Department shall review or have an outside consultant review said submittals. If a Railroad consultant performs said review, the consultant may reply directly to the applicant or their representative after consultation with the Structures Design Department. A copy of the reply will be mailed to the Railroad Representative. During the review process the Railroad Representative is the point of contact to resolve outstanding issues.

12. APPENDIX

ITEM PAGE

1. SAMPLE PROBLEM . . . . . A-1 & A-2

2. CHART A . . . . . A-3 & A-4

3. GUIDELINE & WEBSITE DIRECTORY A-5

4. TABLES A-6

   AREMA Table 8-20-1. Granular Soils

   AREMA Table 8-20-2. Silt and Clay Soils

   AREMA Table 8-20-3. Unit Weights of Soils, and Coefficients of Earth Pressure

5. TEMPLATES

   GENERAL CRITERIA AND MISCELLANEOUS A-7

   GENERAL PLAN VIEW A-8

   TYPICAL SECTION & ELEVATION VIEW A-9

13. BIBLIOGRAPHY

The following list of references used in these guidelines are placed here in alphabetical order for your convenience.

1. *Manual for Railway Engineering*, 2002 American Railway Engineering and Maintenance-of-Way Association.

2. *TRENCHING AND SHORING MANUAL,* January 1990, Revision 11/12/96. State of California Department of Transportation, Office of Structures Construction.

SAMPLE PROBLEM

Point in question: S = 12 ft H = 6 ft

$q = \frac{80{,}000 \text{ lbs}}{(5 \text{ ft})(9 \text{ ft})} = 1778 \text{ psf}$ for E80 loading, axle spacing = 5 ft, tie length b = 9 ft

Solve for $X_1 = S - b/2 = 7.5$ ft

Solve for $X_2 = S + b/2 = 16.5$ ft

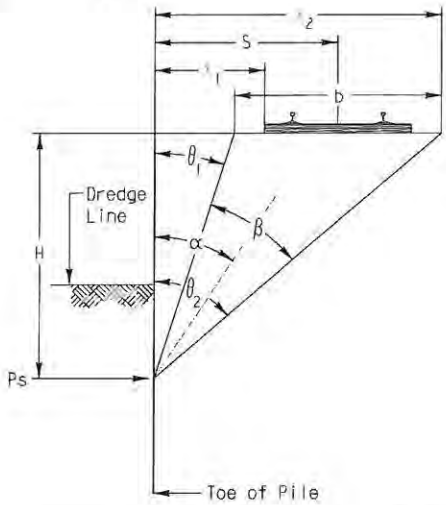
Solve for $\theta_1 = \arctan\left(\frac{X_1}{H}\right) = 0.896$ radians

Solve for $\theta_2 = \arctan\left(\frac{X2}{H}\right) = 1.222$ radians

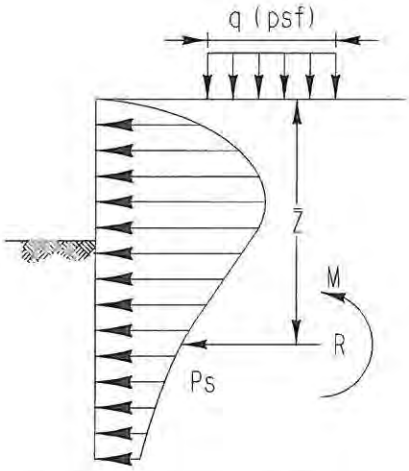
Solve for $\beta = \theta_2 - \theta_1 = 0.326$ radians

Solve for $\alpha = \frac{\theta_1 + \theta_2}{2} = 1.059$ radians

Note: $\tan\alpha \neq \frac{S}{H}$



PRESSURE DISTRIBUTION FOR STRIP LOAD



EQUIVALENT LOADING

- Pressure, Ps due to E80 liveload at the above-identified point:

$$Ps = \frac{2q}{\pi}(\beta - \sin\beta\cos 2\alpha) = \frac{2*1778}{\pi}(0.326 - \sin(0.326)\cos(2*1.059)) = 558.\text{psf}$$

- Shear due to E80 liveload at the above-identified point:

$$R_x = \frac{2qH\beta}{\pi} = \frac{2*1778*6*0.326}{\pi} = 2214.lbs\ /\text{ft}$$

- Depth $\bar{z}$ from base of tie:

$$\bar{z} = \frac{H^2\beta - bH + x_2^2\left(\frac{\pi}{2} - \theta_2\right) - x_1^2\left(\frac{\pi}{2} - \theta_1\right)}{2H\beta} = \frac{6^2*0.326 - 9*6 + 16.5^2\left(\frac{\pi}{2} - 1.222\right) - 7.5^2\left(\frac{\pi}{2} - 0.896\right)}{2*6*0.326} = 3.77\text{ft}$$

- Moment due to E80 liveload at the above identified point:

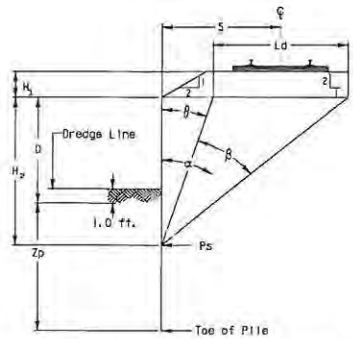
$$M = R_x\left(H - \bar{z}\right) = 2214 * \left(6 - 3.77\right) = 4940 \text{ ft-lbs/ft}$$

Use the above equations to determine Ps, M, R_x & $\bar{z}$ due to the E80 liveload along the **entire** depth of the shoring system. Typically the equations are evaluated on 6" increments to determine the maximum values along the depth of the shoring system. The resultants must be combined with other applicable pressures and loads to evaluate the total loading on the shoring system for the entire depth of the system. Determine the minimum embedment depth required and the minimum cross sectional properties of the shoring system based on the allowable stresses and the required factors of safety.

CHART A

This chart identifies the active pressure and resulting forces due to E80 liveload.
See "SAMPLE PROBLEM" sheet for definitions of variables and equations.

1. Select distance S from track centerline to face of shoring.
2. Select depth H_2 below base of tie.
3. Read Ps, M, R and $\bar{z}$ from the table.
4. Use the procedure outlined in the sample problem to determine values at non-tabulated points.



$$Ps = \frac{2q}{\pi}\left[\beta - \sin\beta\cos(2\alpha)\right]$$

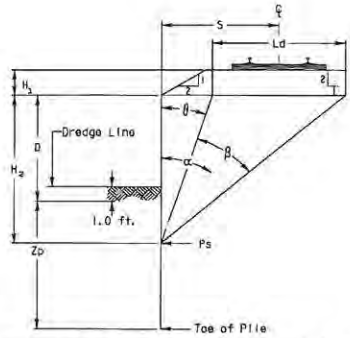
where q = 1778 psf

Boussinesq surcharge pressure E80 live load for H_1=0

Depth below top of shoring H_2 (ft)	Variables		Horizontal distance (S) from shoring to track CL measured at a right angle									
			12	14	16	18	20	22	24	26	28	30
2	**Ps**	(psf)	**305**	**220**	**166**	**130**	**105**	**86**	**72**	**61**	**53**	**46**
	α	(radians)	1.38	1.41	1.44	1.45	1.47	1.48	1.48	1.49	1.50	1.50
	β	(radians)	0.14	0.10	0.07	0.06	0.05	0.04	0.03	0.03	0.02	0.02
	$\bar{z}$	(ft)	1.32	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
	M	(ft-lbs/ft)	215	152	114	89	71	58	49	41	36	31
	R	(lbs/ft)	317	226	170	132	106	87	73	62	53	46
4	**Ps**	(psf)	**496**	**381**	**299**	**240**	**197**	**164**	**138**	**118**	**102**	**89**
	α	(radians)	1.21	1.27	1.31	1.34	1.36	1.38	1.40	1.41	1.43	1.44
	β	(radians)	0.25	0.19	0.14	0.11	0.09	0.07	0.06	0.05	0.05	0.04
	$\bar{z}$	(ft)	2.59	2.61	2.63	2.64	2.64	2.65	2.65	2.65	2.65	2.66
	M	(ft-lbs/ft)	1,609	1,165	882	692	557	459	384	327	281	244
	R	(lbs/ft)	1,141	840	643	508	411	339	285	242	209	182
6	**Ps**	(psf)	**558**	**461**	**381**	**317**	**266**	**225**	**193**	**167**	**146**	**128**
	α	(radians)	1.06	1.13	1.19	1.23	1.27	1.29	1.32	1.34	1.35	1.37
	β	(radians)	0.33	0.25	0.20	0.16	0.13	0.11	0.09	0.08	0.07	0.06
	$\bar{z}$	(ft)	3.77	3.83	3.88	3.90	3.92	3.94	3.95	3.96	3.96	3.97
	M	(ft-lbs/ft)	4,944	3,674	2,830	2,244	1,822	1,508	1,269	1,082	933	813
	R	(lbs/ft)	2,214	1,696	1,332	1,070	877	731	618	529	458	400
8	**Ps**	(psf)	**535**	**476**	**414**	**358**	**309**	**268**	**234**	**205**	**181**	**160**
	α	(radians)	0.94	1.02	1.08	1.13	1.17	1.21	1.24	1.26	1.29	1.30
	β	(radians)	0.37	0.29	0.24	0.19	0.16	0.14	0.12	0.10	0.09	0.08
	$\bar{z}$	(ft)	4.84	4.97	5.06	5.11	5.16	5.19	5.21	5.23	5.24	5.26
	M	(ft-lbs/ft)	10,481	8,006	6,286	5,051	4,141	3,452	2,920	2,501	2,165	1,892
	R	(lbs/ft)	3,316	2,641	2,134	1,751	1,456	1,228	1,047	903	786	689
10	**Ps**	(psf)	**474**	**449**	**411**	**370**	**329**	**293**	**260**	**232**	**207**	**186**
	α	(radians)	0.83	0.92	0.99	1.04	1.09	1.13	1.17	1.19	1.22	1.24
	β	(radians)	0.38	0.32	0.26	0.22	0.19	0.16	0.14	0.12	0.10	0.09
	$\bar{z}$	(ft)	5.81	6.02	6.16	6.26	6.34	6.39	6.44	6.47	6.50	6.52
	M	(ft-lbs/ft)	18,145	14,227	11,385	9,280	7,689	6,463	5,502	4,736	4,117	3,610
	R	(lbs/ft)	4,328	3,571	2,964	2,482	2,099	1,792	1,544	1,341	1,175	1,037
12	**Ps**	(psf)	**404**	**403**	**386**	**360**	**331**	**302**	**274**	**248**	**225**	**204**
	α	(radians)	0.75	0.83	0.90	0.96	1.01	1.06	1.10	1.13	1.16	1.18
	β	(radians)	0.38	0.33	0.28	0.24	0.20	0.18	0.15	0.13	0.12	0.11
	$\bar{z}$	(ft)	6.68	6.97	7.18	7.34	7.46	7.55	7.61	7.67	7.71	7.75
	M	(ft-lbs/ft)	27,703	22,237	18,121	14,980	12,550	10,641	9,121	7,895	6,894	6,068
	R	(lbs/ft)	5,207	4,424	3,763	3,214	2,762	2,389	2,080	1,823	1,608	1,427
14	**Ps**	(psf)	**338**	**351**	**349**	**337**	**319**	**298**	**276**	**255**	**234**	**215**
	α	(radians)	0.68	0.76	0.83	0.89	0.94	0.99	1.03	1.07	1.10	1.13
	β	(radians)	0.38	0.33	0.28	0.25	0.22	0.19	0.17	0.15	0.13	0.12
	$\bar{z}$	(ft)	7.46	7.85	8.13	8.35	8.51	8.64	8.74	8.82	8.89	8.94
	M	(ft-lbs/ft)	38,880	31,856	26,395	22,116	18,729	16,021	13,831	12,043	10,568	9,339
	R	(lbs/ft)	5,948	5,178	4,499	3,913	3,414	2,990	2,631	2,327	2,068	1,847
16	**Ps**	(psf)	**280**	**301**	**310**	**308**	**300**	**286**	**271**	**254**	**237**	**220**
	α	(radians)	0.62	0.70	0.77	0.83	0.88	0.93	0.97	1.01	1.04	1.07
	β	(radians)	0.36	0.32	0.28	0.25	0.22	0.20	0.18	0.16	0.14	0.13
	$\bar{z}$	(ft)	8.17	8.64	9.01	9.29	9.51	9.68	9.82	9.93	10.03	10.10
	M	(ft-lbs/ft)	51,411	42,880	36,066	30,598	26,183	22,590	19,644	17,207	15,175	13,468
	R	(lbs/ft)	6,563	5,829	5,158	4,560	4,034	3,576	3,179	2,837	2,540	2,284

This chart identifies the active pressure and resulting forces due to E80 liveload.
See "SAMPLE PROBLEM" sheet for definitions of variables and equations.

1. Select distance S from track centerline to face of shoring.
2. Select depth H_2 below base of tie.
3. Read Ps, M, R and $\bar{z}$ from the table.
4. Use the procedure outlined in the sample problem to determine values at non-tabulated points.



$$Ps = \frac{2q}{\pi}\left[\beta - \sin\beta\cos(2\alpha)\right]$$

where q = 1778 psf

Boussinesq surcharge pressure E80 live load for H_1=0

Depth below top of shoring H_2 (ft)	Variables		Horizontal distance (S) from shoring to track CL measured at a right angle									
			12	14	16	18	20	22	24	26	28	30
18	**Ps**	(psf)	**231**	**256**	**271**	**277**	**276**	**269**	**259**	**247**	**234**	**220**
	α	(radians)	0.57	0.64	0.71	0.77	0.82	0.87	0.92	0.96	0.99	1.02
	β	(radians)	0.35	0.31	0.28	0.25	0.23	0.20	0.18	0.16	0.15	0.13
	$\bar{z}$	(ft)	8.80	9.37	9.81	10.16	10.44	10.67	10.85	11.00	11.12	11.22
	M	(ft-lbs/ft)	65,062	55,110	46,976	40,313	34,834	30,304	26,536	23,384	20,728	18,477
	R	(lbs/ft)	7,072	6,386	5,739	5,145	4,609	4,132	3,710	3,338	3,012	2,725
20	**Ps**	(psf)	**191**	**217**	**236**	**246**	**250**	**249**	**244**	**237**	**227**	**217**
	α	(radians)	0.52	0.59	0.66	0.72	0.77	0.82	0.87	0.91	0.94	0.98
	β	(radians)	0.33	0.30	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14
	$\bar{z}$	(ft)	9.37	10.03	10.56	10.98	11.32	11.59	11.82	12.01	12.16	12.30
	M	(ft-lbs/ft)	79,641	68,368	58,973	51,137	44,586	39,093	34,465	30,548	27,216	24,367
	R	(lbs/ft)	7,493	6,859	6,245	5,668	5,135	4,651	4,214	3,822	3,474	3,163
22	**Ps**	(psf)	**159**	**184**	**204**	**217**	**225**	**228**	**227**	**223**	**217**	**210**
	α	(radians)	0.49	0.55	0.62	0.67	0.73	0.77	0.82	0.86	0.90	0.93
	β	(radians)	0.31	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.14
	$\bar{z}$	(ft)	9.89	10.64	11.24	11.73	12.14	12.47	12.74	12.97	13.17	13.33
	M	(ft-lbs/ft)	94,986	82,497	71,913	62,945	55,341	48,878	43,370	38,658	34,611	31,122
	R	(lbs/ft)	7,842	7,260	6,684	6,131	5,611	5,128	4,685	4,283	3,918	3,590
24	**Ps**	(psf)	**133**	**157**	**176**	**191**	**202**	**207**	**210**	**209**	**206**	**201**
	α	(radians)	0.45	0.52	0.58	0.63	0.68	0.73	0.78	0.82	0.85	0.89
	β	(radians)	0.30	0.28	0.26	0.24	0.22	0.20	0.19	0.17	0.16	0.15
	$\bar{z}$	(ft)	10.35	11.19	11.87	12.44	12.90	13.29	13.62	13.89	14.13	14.32
	M	(ft-lbs/ft)	110,969	97,366	85,670	75,625	66,997	59,577	53,183	47,661	42,875	38,716
	R	(lbs/ft)	8,132	7,600	7,064	6,540	6,037	5,564	5,122	4,715	4,342	4,001
26	**Ps**	(psf)	**112**	**134**	**153**	**168**	**180**	**188**	**192**	**194**	**193**	**191**
	α	(radians)	0.42	0.48	0.54	0.60	0.65	0.69	0.74	0.78	0.82	0.85
	β	(radians)	0.28	0.27	0.25	0.23	0.22	0.20	0.19	0.17	0.16	0.15
	$\bar{z}$	(ft)	10.78	11.69	12.45	13.09	13.62	14.07	14.44	14.77	15.04	15.28
	M	(ft-lbs/ft)	127,485	112,863	100,135	89,071	79,460	71,105	63,836	57,499	51,963	47,113
	R	(lbs/ft)	8,376	7,890	7,393	6,899	6,418	5,959	5,524	5,118	4,741	4,393
28	**Ps**	(psf)	**94**	**114**	**132**	**148**	**160**	**169**	**175**	**179**	**180**	**180**
	α	(radians)	0.40	0.46	0.51	0.56	0.61	0.66	0.70	0.74	0.78	0.81
	β	(radians)	0.27	0.26	0.24	0.23	0.21	0.20	0.19	0.17	0.16	0.15
	$\bar{z}$	(ft)	11.17	12.16	12.99	13.70	14.29	14.80	15.23	15.60	15.91	16.19
	M	(ft-lbs/ft)	144,448	128,896	115,211	103,191	92,642	83,385	75,258	68,113	61,823	56,274
	R	(lbs/ft)	8,581	8,137	7,677	7,214	6,758	6,315	5,892	5,491	5,115	4,764
30	**Ps**	(psf)	**80**	**98**	**115**	**130**	**142**	**152**	**160**	**165**	**167**	**168**
	α	(radians)	0.37	0.43	0.48	0.53	0.58	0.63	0.67	0.71	0.74	0.78
	β	(radians)	0.26	0.25	0.23	0.22	0.21	0.20	0.18	0.17	0.16	0.15
	$\bar{z}$	(ft)	11.52	12.59	13.49	14.26	14.92	15.48	15.97	16.38	16.75	17.06
	M	(ft-lbs/ft)	161,789	145,388	130,819	117,903	106,466	96,343	87,381	79,443	72,404	66,153
	R	(lbs/ft)	8,755	8,349	7,925	7,492	7,060	6,636	6,227	5,834	5,462	5,112
32	**Ps**	(psf)	**69**	**85**	**101**	**115**	**127**	**137**	**145**	**151**	**155**	**157**
	α	(radians)	0.35	0.41	0.46	0.51	0.55	0.60	0.64	0.68	0.71	0.75
	β	(radians)	0.25	0.24	0.22	0.21	0.20	0.19	0.18	0.17	0.16	0.15
	$\bar{z}$	(ft)	11.85	12.98	13.95	14.79	15.51	16.13	16.67	17.13	17.54	17.89
	M	(ft-lbs/ft)	179,452	162,274	146,888	133,136	120,859	109,909	100,144	91,432	83,655	76,706
	R	(lbs/ft)	8,904	8,532	8,140	7,736	7,329	6,925	6,531	6,150	5,785	5,438

BNSF guidelines are as follows:

a. Guidelines for Design and Construction of Grade Separation Structures.

UPRR guidelines are as follows:

a. **Underpass Structures** – "Guidelines for Design and Construction of Grade Separation Underpass Structures."
b. **Overhead Grade Separation** – "Guidelines for Design of Highway Separation Structures Over Railroad (Overhead Grade Separation)."
c. **Demolition** – "Guidelines for Preparation of a Bridge Demolition and Removal Plan for Structures Over Railroad."
d. **Shoofly** – "Guidelines for Design and Construction of Shoofly (Detour) Tracks."
e. **Fiber Optic** – "UPRR Fiber Optic Engineering, Construction And Maintenance Standards." 1/1/2002
f. **Pipeline** – "Pipeline Installation" available at www.uprr.com.
g. **Industry Track** – "Technical Specification for Construction of Industrial Tracks"

WEBSITE DIRECTORY:

1. www.astm.org
2. www.arema.org
3. www.bnsf.com
4. www.pilespecs.com
5. www.uprr.com

AREMA Table 8-20-1. Granular Soils

Descriptive Term for Relative Density	Standard Penetration Test Blows per Foot "N"
Very Loose	0 - 4
Loose	4 - 10
Medium	10 - 30
Dense	30 - 50
Very Dense	Over 50

AREMA Table 8-20-2. Silt and Clay Soils

Descriptive Term for Consistency	Unconfined Compressive Strength Tons per Square Foot
Very Soft	Less than 0.25
Soft	0.25 - 0.50
Medium	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	Over 4.00

AREMA Table 8-20-3. Unit Weights of Soils, and Coefficients of Earth Pressure

Type of Soil	Unit Weight of Moist Soil, γ (Note 1)		Unit Weight of Submerged Soil, γ' (Note 1)		Coefficient of Active Earth Pressure, K_A				Coefficient of Passive Earth Pressure, Kp		
					For Backfill	For Soils in Place	Friction Angles (Note 2)		For Soils in Place	Friction Angles (Note 2)	
	Minimum	Maximum	Minimum	Maximum			ϕ	δ		ϕ	δ
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Clean Sand:											
Dense	110	140	65	78		0.20	38	20	9.0	38	25
Medium	110	130	60	68		0.25	34	17	7.0	34	23
Loose	90	125	56	63	0.35	0.30	30	15	5.0	30	20
Silty Sand:											
Dense	110	150	70	88		0.25			7.0		
Medium	95	130	60	68		0.30			5.0		
Loose	80	125	50	63	0.50	0.35			3.0		
Silt and Clay (Note 3)	$\frac{165(1+w)}{1+2.65w}$		$\frac{103}{1+2.65w}$		1.00	$1-\frac{q_u}{\bar{p}+\gamma\bar{z}}$			$1+\frac{q_u}{\bar{p}+\gamma\bar{z}}$		

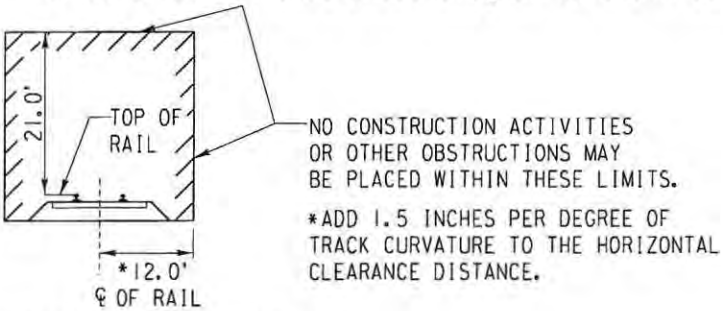
Note 1: In pounds per cubic foot.
Note 2: These angles, expressed in degrees, are ϕ, the angle of internal friction, and δ, the angle of wall friction, and are used in estimating the coefficients under which they are listed.
Note 3: The symbol γ represents γ or γ', whichever is applicable; p is the effective unit pressure on the top surface of the stratum; q_u is the unconfined compressive strength; w is the natural water content, in percentage of dry weight; and z is the depth below the top surface of the stratum.

General criteria:

a. Design loads to be based on the AREMA manual and Cooper E80 loading.
b. Pressure due to embankment surcharges.
c. ASTM designation and yield strength for each material.
d. Maximum allowable bending stress for steel is 0.55Fy.
e. Temporary overstress allowances are not acceptable.
f. All timber members shall be Douglas Fir Grade 2 or better.
g. Insitu soil classification.
h. Backfill soil classification.
i. Internal angle of friction and unit weight of soil.
j. Active and passive soil coefficients.
k. Backfill compacted to a minimum of 95% Proctor density per ASTM D-1557.
l. Slopes without shoring shall not be steeper than 2 horizontal to 1 vertical.
m. Dredge line elevation.
n. Shoring deflection to be calculated and meet Railroad requirements.

Miscellaneous:

a. Project name, location, GPS coordinates, track owner, Railroad line segment, milepost and subdivision in the title block.
b. Procedure outlining the installation and removal of the temporary shoring system.
c. General notes specifying material requirements, design data, details, dimensions and cross-sections, sequence of construction etc.
d. A description of tieback installation including drilling, grouting, stressing information and testing procedures, anchor capacity, type of tendon, anchorage hardware, minimum unbonded lengths, minimum anchor lengths, angle of installation, tieback locations and spacing.
e. All details for construction of drainage facilities associated with the shoring system shall be clearly indicated.
f. Details and descriptions of all shoring system members and connection details.
g. Settlement and displacement calculations.
h. Handrail and protective fence details along the excavations.
i. Drawings must be signed and stamped by a Licensed Professional Engineer, registered in the state where the work will be performed.
j. Call before you dig number.
k. Construction clearances diagram as shown below.



MINIMUM CONSTRUCTION CLEARANCES
(NORMAL TO RAILROAD)
Not to scale

DESIGN BY:	NAME & LOGO OF ENGINEERING FIRM OR PROJECT OWNER
DRAWN BY:	
SCALE:	GENERAL CRITERIA AND MISCELLANEOUS
DRAWING NO:	
SHEET: 1 of 3	RR M.P. SUBDIVISION
DOT#:	CITY COUNTY STATE
DATE:	PROJECT NAME & LOCATION

General plan view should show:

a. Railroad right-of-way and North arrow.
b. Position of all Railroad tracks and identify each track as mainline, siding, spur, etc.
c. Spacing between all existing tracks.
d. Location of all access roadways, drainage ditches and direction of flow.
e. Footprint of proposed structure, proposed shoring system and any existing structures if applicable.
f. Proposed horizontal construction clearances. The minimum allowable is 12 feet measured at a right angle from centerline of track.
g. Location of existing and proposed utilities.
h. Drawings must be signed and stamped by a Licensed Professional Engineer, registered in the state where the work will be performed.
i. Railroad and other "CALL BEFORE YOU DIG" numbers.
j. Detailed view of shoring along with controlling elevations and dimensions.

DESIGN BY:	NAME & LOGO OF ENGINEERING FIRM OR PROJECT OWNER		
DRAWN BY:			
SCALE:	GENERAL PLAN VIEW		
DRAWING NO:			
SHEET: 2 OF 3	RR M.P.		SUBDIVISION
DOT#:	city	COUNTY	STATE
DATE:	PROJECT NAME & LOCATION		

Typical section and elevation should show:

a. Top of rail elevations for all tracks.
b. Offset from the face of shoring system to the centerline of all tracks at all changes in horizontal alignment.
c. All structural components, controlling elevations and dimensions of shoring system.
d. All drainage ditches and controlling dimensions.
e. All slopes, existing structures and other facilities which may surcharge the shoring system.
f. Location of all existing and proposed utilities.
g. Total depth of shoring system.

DESIGN BY:	NAME & LOGO OF ENGINEERING FIRM OR PROJECT OWNER		
DRAWN BY:			
SCALE:	TYPICAL SECTION & ELEVATION VIEW		
DRAWING NO:			
SHEET: 3 of 3	RR M.P.		SUBDIVISION
DOT#:	CITY	COUNTY	STATE
DATE:	PROJECT NAME & LOCATION		

EARTHWORK SUMMARY TABLE

	LOCATION	EXCAVATION FOR BENEFICIAL REUSE SOILS (CU. YDS.) NOTES 5 & 6	OVER-EXCAVATION (CU. YDS.) NOTES 2 & 6	EARTHWORK MEASURED IN EMBANKMENT (CU. YDS.) NOTES 1, 2 & 3	EMBANKMENT SURCHARGE (CU. YDS.) NOTE 1	STOCKPILED SOILS FOR REUSE IN EMBANKMENT (CU. YDS.) NOTE 7	SURCHARGE REMOVAL AND REUSE IN PHASE II EMBANKMENT (CU. YDS.) NOTE 4	STOCKPILED SOILS FOR BENEFICIAL REUSE (CU. YDS.) NOTES 5 & 7
PHASE I EARTHWORK	2107+50.00 to 2118+80.00	11,689	13,559	101,720	–	–	–	–
	2109+30.00 to 2114+30.00	–	–	–	62,149	–	–	–
	1306+28.50 to 1309+06.25	470	–	33	–	–	–	–
	200+00.00 to 208+94.20	545	–	312	–	–	–	–
	OFF-SITE STOCKPILE	–	–	(-56,300)	–	76,000	–	18,500
	NORTH STOCKPILE ACCESS	–	–	590	–	–	–	–
	PHASE I SUBTOTALS	12,704	13,559	46,355	62,149	76,000	0	18,500
PHASE II EARTHWORK	2095+35.00 to 2108+00.00	31,579	31,355	105,152	–	–	–	–
	2101+00.00 to 2105+50.00	–	–	(-6,874)	8,936	–	8,936	–
	2109+30.00 to 2114+30.00	–	–	(-47,807)		–	62,149	–
	FINAL ACCESS ROAD AND PARKING AREA	–	–	5,600	–	–	–	–
	PHASE II SUBTOTALS	31,579	31,355	56,071	8,936	0	71,085	0
	PROJECT TOTAL	44,283	44,914	102,426	71,085	76,000	71,085	18,500

GENERAL EARTHWORK NOTES:

1. THE QUANTITIES SHOWN FOR "EARTHWORK MEASURED IN EMBANKMENT" AND "EMBANKMENT SURCHARGE" ARE IN-PLACE VOLUMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE APPROPRIATE COMPACTION FACTOR TO USE IN DETERMINING THE FINAL QUANTITIES OF BORROW REQUIRED TO CONSTRUCT THE EMBANKMENTS TO THE LINES AND GRADES SHOWN ON THE PLANS. REFER TO THE GEOTECHNICAL REPORT FOR THE DENSITY REQUIREMENTS FOR FILLS AND EMBANKMENTS.

2. THE "OVER-EXCAVATION" QUANTITY SHOWN IS AN IN-PLACE VOLUME BASED UPON EXISTING SITE CONDITIONS. AN ASSUMED 1.35 COMPACTION FACTOR WAS APPLIED TO THE EXISTING IN-PLACE OVER-EXCAVATION VOLUME TO DETERMINE THE ADDITIONAL "EARTHWORK MEASURED IN EMBANKMENT" QUANTITY NEEDED TO OFFSET THE LOSS IN SOIL VOLUME DUE TO COMPACTION OF THE REWORKED SOILS.

3. THE NEGATIVE NUMBER SHOWN IN THE "EARTHWORK MEASURED IN EMBANKMENT" COLUMN REFLECTS THE IN-PLACE COMPACTED VOLUME OF THE STOCKPILED SOIL REUSED IN EMBANKMENT OR THE SURCHARGE EMBANKMENT THAT HAS BEEN REMOVED AND REUSED IN THE PHASE II EMBANKMENT. THE ASSUMED COMPACTION FACTOR FOR STOCKPILED SOILS REUSED IN EMBANKMENT IS 1.35 AND THE ASSUMED COMPACTION FACTOR FOR THE SURCHARGE SOILS REMOVED AND REUSED IN THE PHASE II EMBANKMENT CONSTRUCTION IS 1.30.

4. EMBANKMENT SURCHARGE SHALL BE USED IN THE CONSTRUCTION OF THE PHASE II EMBANKMENTS.

5. THE CONTRACTOR SHALL HAUL AND PLACE "BENEFICIAL REUSE" SOILS FROM THE EXCAVATIONS AND EXISTING STOCKPILES TO THE CITY OF LINCOLN'S NORTH 48TH STREET SOLID WASTE FACILITY. REFER TO THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.

6. RECOMMENDED DEPTHS FOR "EXCAVATION FOR BENEFICIAL REUSE SOILS" AND "OVER-EXCAVATION" HAVE BEEN DETERMINED BY THE SOIL BORING LOGS. REFER TO THE GEOTECHNICAL REPORTS FOR ADDITIONAL INFORMATION.

7. THE "STOCKPILED SOILS FOR BENEFICIAL REUSE" VOLUME AND THE "STOCKPILED SOILS FOR REUSE IN EMBANKMENT" VOLUME ARE ESTIMATED QUANTITIES. THE FINAL PAY QUANTITIES WILL BE DETERMINED BY CROSS SECTIONING THE STOCKPILE AREA PRIOR TO THE START OF CONSTRUCTION AND AFTER THE HAULING HAS BEEN COMPLETED.

8. A PORTION OF THE EXISTING EXCAVATED SOILS THAT HAVE BEEN DETERMINED TO BE UNSUITABLE FOR FILL AT THE SITE MAY NOT MEET THE REQUIREMENTS FOR "BENEFICIAL REUSE" SOILS DUE TO INCLUSION OF CONSTRUCTION AND DEMOLITION WASTE MATERIAL. AS SUCH, 1,000 CUBIC YARDS OF THIS EXCAVATED VOLUME AS CALCULATED BASED UPON THE CROSS SECTIONS HAS BEEN ASSUMED TO BE CONSIDERED AS CONSTRUCTION AND DEMOLITION WASTE MATERIAL WHICH CANNOT BE USED FOR BENEFICIAL REUSE SOILS. IN ADDITION, 500 CUBIC YARDS OF THE EXISTING STOCKPILED SOILS HAVE BEEN ASSUMED TO NOT MEET THE REQUIREMENTS FOR BENEFICIAL REUSE AND WILL BE CLASSIFIED AS CONSTRUCTION AND DEMOLITION WASTE MATERIALS AS WELL. SEPARATE PAYMENT SHALL BE MADE FOR DISPOSAL OF CONSTRUCTION AND DEMOLITION WASTE MATERIAL.

9. REFER TO THE SPECIAL PROVISIONS AND THE GEOTECHNICAL REPORTS FOR ADDITIONAL REQUIREMENTS.

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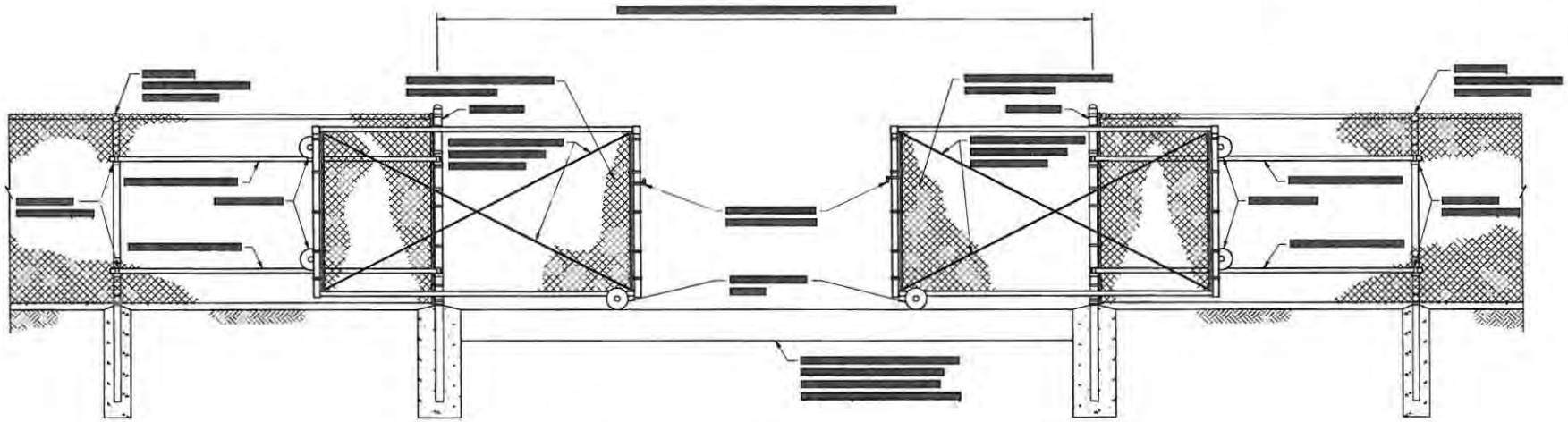
PROJ: Haymarket Site Grading
PRV: Site Details
USER: jwg1er
DATE: 4/15/2011
DGN: P:\PROJECTS-800-2499\Design\Grade_Site_Prep\Details\870703DT01_A4.dgn

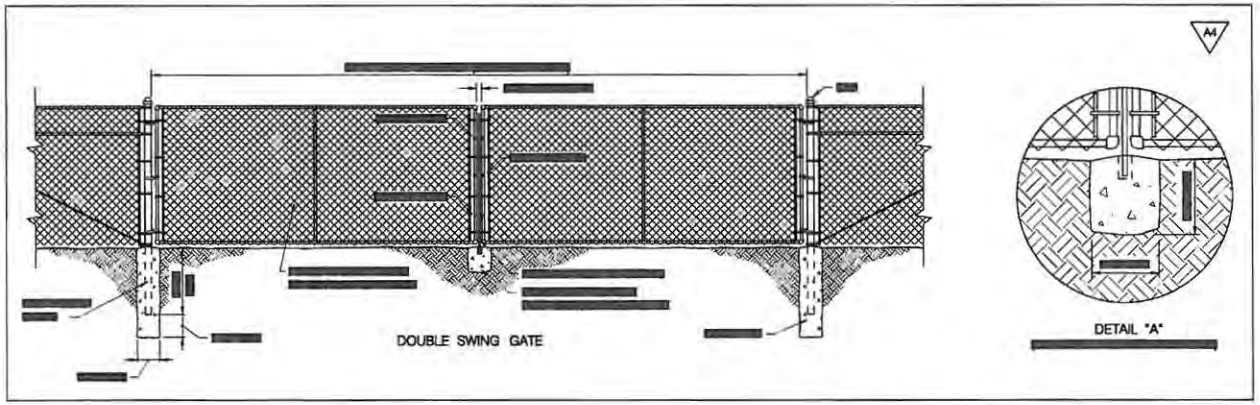
LINCOLN Haymarket Infrastructure Plan

WEST HAYMARKET

PROJECT NO.	SHEET NO.
870703	11
Date: 4/15/2011	Drawn: JJM Checked: JGG Approved: TAL

117-E-46





A4

PROFESSIONAL CIVIL ENGINEER
THOMAS A LEIKAM
E-6290
STATE OF NEBRASKA

117-E-46

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117-E-46

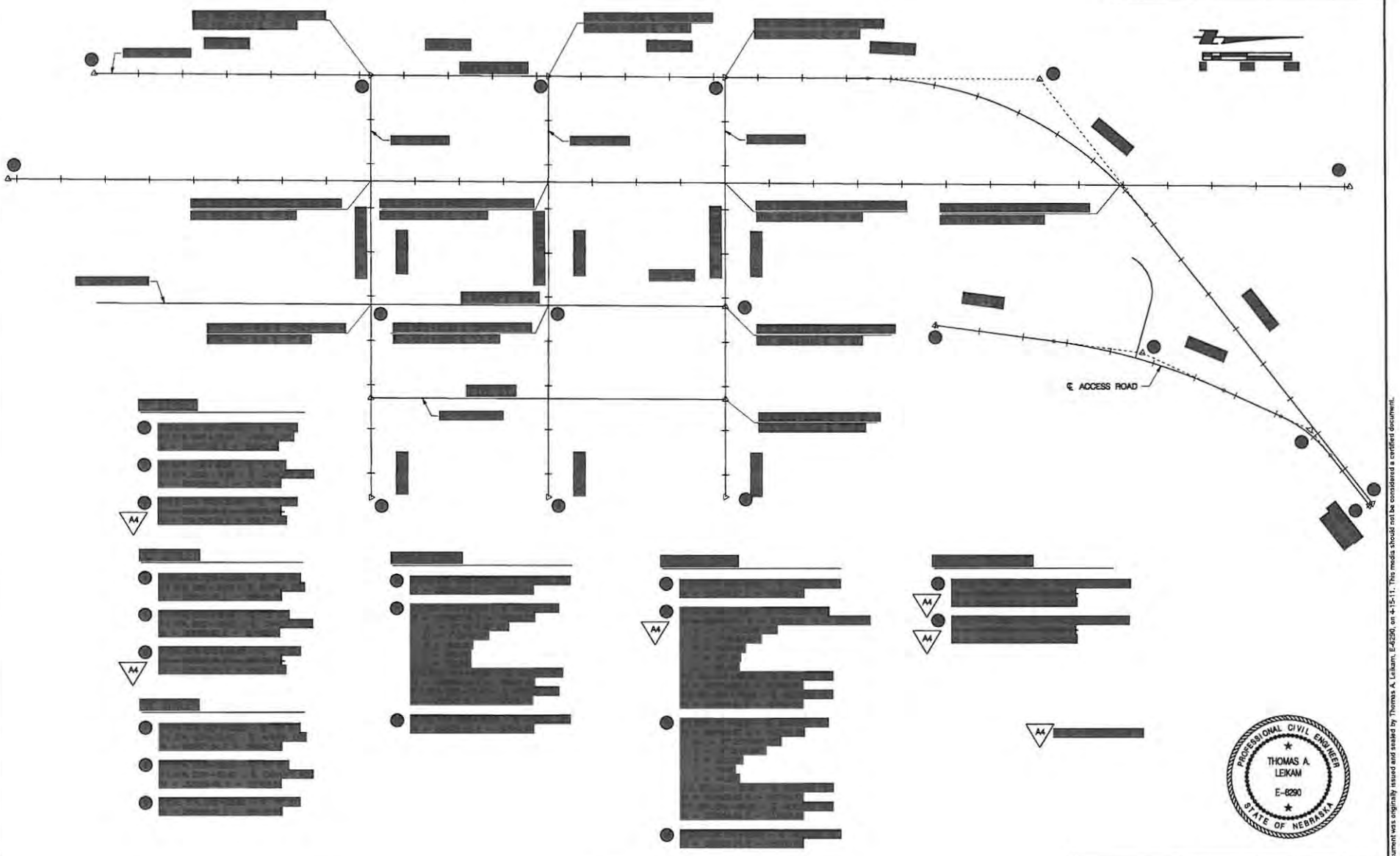
PROJ: Haymarket Site Grading
FILE: Site Plan.dgn
USER: bjenkinson
DATE: 4/16/2011
DGN: P:\PROJECTS\870-3470\Design\Sheets_Site_Prep\General\870703H01_A4.dgn

LINCOLN Haymarket Redevelopment Team

WEST HAYMARKET

PROJECT NO.	SHEET NO.
870703	13
Date: 4/15/2011	Drawn: JJM
Horz. Scale 1: 20'	Checked: JGO
	Approved: TAL

117-E-46



117-E-46

This document was originally issued and sealed by Thomas A. Leikam, E-8290, on 4-15-11. This media should not be considered a certified document.

117-E-46

PROJ: Haymarket Site Grading
PTRN: Haymarket
USER: hwg1er
DATE: 4/15/2011
DGN: P:\PROJECTS\870-3470 Design\Sheets_Site_Plan\General\870703GN02_A4.dgn

LINCOLN
Haymarket Infrastructure District

WEST HAYMARKET
AREA OF PUBLIC INTEREST

PROJECT NO.	SHEET NO.
870703	7
Date: 4/15/2011	Drawn: BLJ
Horz. Scale: 1" = 100'	Checked: JGO
	Approved: TAL

117-E-46

ACCESS TO STOCKPILE
DUNSMUIR CRUSHED ROCK SURFACE COURSE FOR CONSTRUCTION ENTRANCE
GEOTEXTILE FILTER FABRIC
EXISTING STOCKPILE APPROXIMATELY 10,000 CY
EXISTING STOCKPILE APPROXIMATELY 60,000 CY
ACCESS TO STOCKPILE
PARK DRIVE
PARK TRACKS
PARK STREET
PARKING LOT
PARKING LOT
PARKING LOT

PROJ: Haymarket Site Grading
FILE: 870703WW02
USER: jwagner
DATE: 4/15/2011
DGN: P:\PROJECTS 870-2470\Design\Sheets_Site_Prep\Waste Water\870703WW02_A4.dgn

LINCOLN Haymarket Redevelopment Team

WEST HAYMARKET

PROJECT NO.	SHEET NO.
870703	83
Date: 4/15/2011	Drawn: JME
Horz. Scale 1: 40	Checked: JGO
	Approved: DAL

117-E-48

0 20 40

CONCRETE STRUCTURE BELOW GROUND LEVEL COVERED WITH WOOD PLANKS.

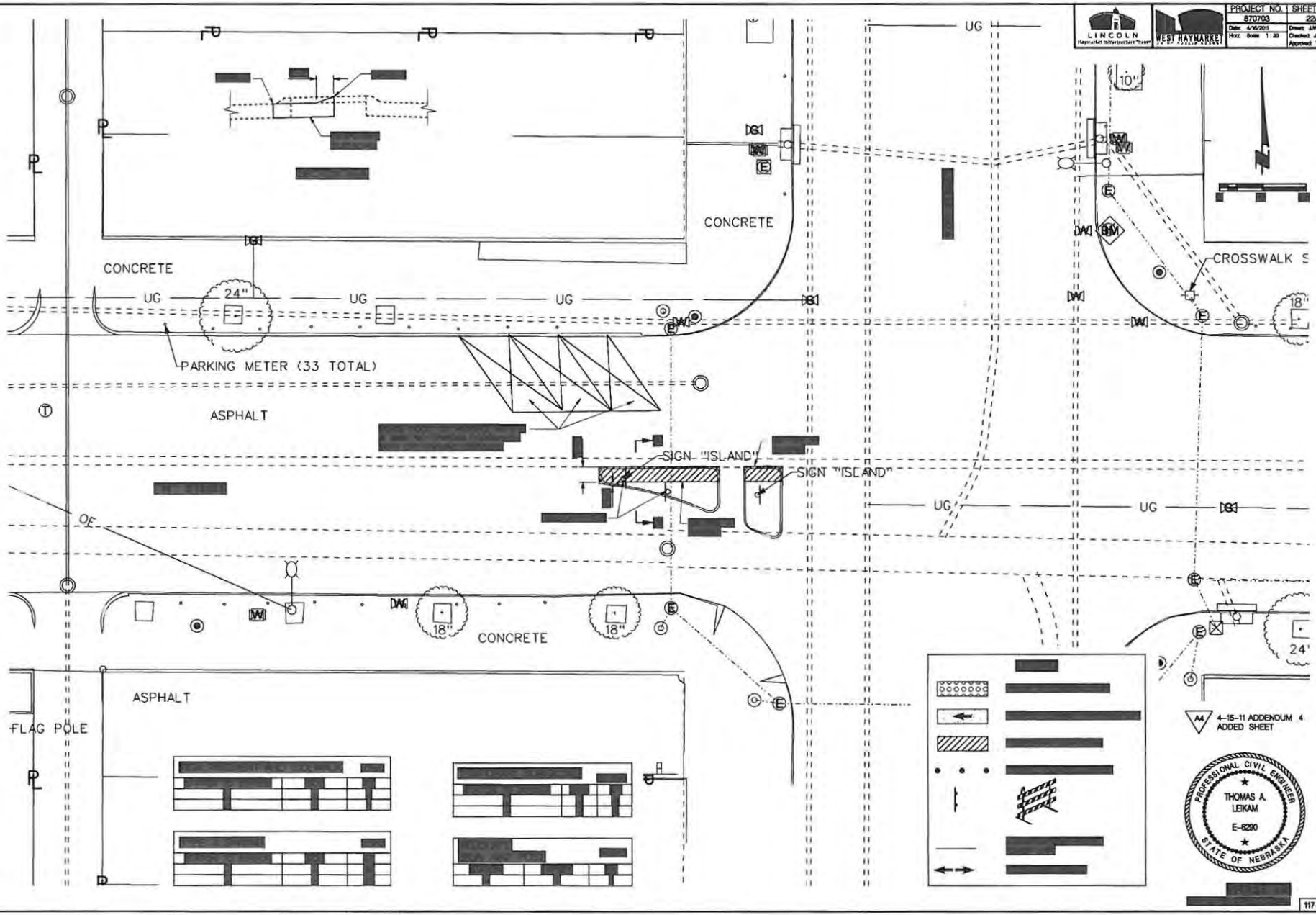
PROFESSIONAL CIVIL ENGINEER
THOMAS A. LEIKAM
E-6290
STATE OF NEBRASKA

1155 1150 1145 1140 1135 1130 1125 1120

4007+00 4008+00 4009+00

117-E-48

This document was originally issued and sealed by Thomas A. Leikam, E-6290, on 4-15-11. This media should not be considered a certified document.



This document was originally issued and sealed by Thomas A. Leikam, E-6290, on 4-15-11. This media should not be considered a certified document.

Attachment # 1

Nebraska Department of Environmental Quality

Wastewater Section
1200 'N' Street, Suite 400, The Atrium
PO Box 98922
Lincoln, NE 68509-8922
Tel. 402/471-4220
Fax 402/471-2909

DW-NOI

Notice of Intent (NOI) for Requesting Dewatering Discharges Authorization Under the General NPDES Permit NEG671000

Submission of this Notice of Intent fulfills the requirements set forth in Section B of NPDES General Permit Number NEG671000. By submission of this Notice of Intent the applicant is requesting authorization to discharge under the terms and conditions of said permit, and is agreeing to meet all of the terms and conditions set forth in said permit.

Once authorization to discharge is granted violations of the terms and conditions of the permit may result in the initiation of enforcement proceedings pursuant to sections 81-1508 through 81-1508.02 of the Nebraska Environmental Protection Act (Reissue 1987 and Cum. Supp. 1994). Among the enforcement options authorized by the Act are civil penalties of up to $10,000 per day per violation.

The permit should be consulted for additional information on the completion of this NOI. Questions concerning the NOI or the permit should be directed to the Wastewater Section at (402) 471-4220. Written requests and submittals should be sent to the Wastewater Section at the address set forth on page 4 of this NOI.

1. **Facility Owner or Operator**

   If both the owner and the operator are to be jointly responsible for permit compliance, then both must be identified. If not, only the owner or the operator, whichever is responsible for permit compliance should be identified.

   Owner or Operator Name: West Haymarket Joint Public Agency

   Cognizant Official: Jayne Snyder, Chair

2. **Identification and Location Of Sources**

   a. **Facility Name:** West Haymarket Redevelopment Area

   b. **Facility Location:** (location description, not mail address):

   See attached Exhibit 1 (Map of Area)

   c. **Legal Description**:

   _____ Quarter of the SW Quarter, _____ Section 23, Township 10 N, Range 6 (E or W),

   County Lancaster

   d. **Receiving Stream or Waterbody:** Salt Creek

e. **Is the Receiving Stream listed in Appendix B of the permit?** Yes (No)
(If yes, submit a site specific NPDES permit application)

f. **Is this a direct discharge into a waterbody listed in NDEQ Title 117, Chapter 6?** Yes (No)

g. **Is the dewatering discharge to a Municipal Separate Storm Sewer System?** (Yes) No

h. **Have you notified the Municipal Separate Storm Sewer System operator?** (Yes) No

i. **After contacting the Nebraska Game and Parks Commission, did the Commission have any concerns about impact(s) to the listed endangered or threatened species or their critical habitat(s)? If yes, submit a site specific NPDES permit application.** Yes (No)

Explain: See attached "Threatened & Endangered Species Guidance Checklist".

j. **After contacting the Nebraska Historical Society, did the Society have any concerns about impact(s) to historical site(s) If yes, submit a site specific NPDES permit application.** (Yes) No

Explain: SHPO has asked for continuing communication & coordination throughout the project.

3. **Owner or Operator and Authorized Representative**

The responsibilities and requirements of the "Owner or Operator" and the "Authorized Representative" are set forth on page 4 of this NOI. If both the owner and the operator are to be jointly responsible for permit compliance, then a cognizant official for both must be identified. Only one Authorized Representative can be specified. An Authorized Representative need not be identified if a Cognizant Official wishes to be the sole contact for the Department.

a. **Owner or Operator**

Name: West Haymarket Joint Public Agency Title: Chair
Cognizant Official: Jayne Snyder
Mail Address: 555 S. 10th Street, Room 111

City: Lincoln State: NE Zip Code: 68508

Telephone: 402-441-7515

b. **Authorized Representative**

Name: Dan Marvin Title: Project Administrator

Mail Address: 555 S. 10th Street

City: Lincoln State: NE Zip Code: 68508

Telephone: 402-310-7110

4. **Discharge Information**

a. How many discharge outfalls are present? One; Salt Creek

For each outfall, identify the following information:

b. Outfall 1:

1) What is the source of the discharge? (i.e. chlorinated municipal water, storm water, surface water or ground water):

ground water

2) Anticipated Start-Up Date: 2011 Anticipated Completion Date: 2014

3) Anticipated Discharge Flow Rate: variable Anticipated Discharge Frequency variable

c. Outfall 2:

1) What is the source of the discharge? (i.e. chlorinated municipal water, storm water, surface water or ground water):

n/a

2) Anticipated Start-Up Date: _____ Anticipated Completion Date: _____

3) Anticipated Discharge Flow Rate: _____ Anticipated Discharge Frequency _____

d. Outfall 3:

1) What is the source of the discharge? (i.e. chlorinated municipal water, storm water, surface water or ground water):

n/a

2) Anticipated Start-Up Date: _____ Anticipated Completion Date: _____

3) Anticipated Discharge Flow Rate: _____ Anticipated Discharge Frequency _____

5. Identification of Potential Pollutants in the Discharge

Identify any pollutants that you know may be potentially present in the discharge or any materials stored in the vicinity that if spilled could contaminate the discharge. Also identify any ground water contamination plumes, previous spills or other events that you know have occurred and that may contribute pollutants to the discharge.

Please refer to attached letter from NDEQ dated February 18, 2011.

6. Certification

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

I further certify that:

I, or qualified members of my staff, have reviewed and understand the terms and conditions of NPDES General Permit Number NEG671000;

The facility identified in Section 1 of this NOI meets the "Eligibility" requirements and is not excluded by the "Limitation of Coverage" requirements, set forth in Section B of the permit; and

I understand that the submission of this NOI obligates the facility identified in Section 1 of this NOI to comply with the terms and conditions of the Permit NEG671000, provided authorization to discharge is obtained.

Owner's or Operator's Signature	3/10/2011 Date Signed
Owner's or Operator's Signature	Chair, West Haymarket JPA Title

Qualifications and Responsibilities of the "Owner or Operator" and the "Authorized Representative"
The qualifications and responsibilities of the "Owner or Operator" are set forth in NDEQ Title 119 Chapter 13 002:

All permit applications submitted to the Department shall be signed:

002.01 – For a corporation by a responsible corporate officer;

002.02 - For a partnership or in the case of a sole proprietorship by a general partner or the proprietor; and

002.03 - For a municipal, State, Federal, or other public facility by either a principal executive officer or ranking elected official."

The qualifications and responsibilities for the "authorized representative" are set forth in NDEQ Title 119 Chapter 13 003:

"All other correspondence, reports and DW-DMR's shall be signed by a person designated in 002.01 through 002.03 or a duly authorized representative if such representative is responsible for the overall operation of the facility from which the discharge originates; the authorization is made in writing by the person designated under 002.01 through 002.03 and the written authorization is submitted to the Director. "The authorized representative may also sign DW-NOIs, if the Cognizant Official has specifically authorized them to perform this task in a previous DW-NOI or in other written documentation as set forth in permit Section C.2.g.

Submit the completed NOI to:

U.S. Postal Service Address:

Wastewater Section
Nebraska Department of Environmental Quality
PO Box 98922
Lincoln, NE 68509-8922
Telephone: (402) 471-4220

Alternate Carrier Address:

Wastewater Section
Nebraska Department of Environmental Quality
1200 'N' Street, The Atrium, Suite 400
Lincoln, NE 68509

Nebraska Department of Environmental Quality

Reserved for NDEQ use only

THREATENED & ENDANGERED SPECIES
Guidance Checklist for
NPDES Construction Storm Water General Permit
#NER110000

***** Disclaimer: This checklist was developed for guidance purposes only in an effort to assist Construction Storm Water permit applicants to identify potential locations of threatened and endangered species. Completion of this checklist is not a requirement for permit authorization and is not intended to be used as a substitute for a professional environmental review. The use of this form does not relieve the permittee from further review or enforcement action by the Department of Environmental Quality (NDEQ) or Nebraska Game and Parks Commission (NG&PC).**

Section I

1. For projects not located in Lancaster County: Is the project located outside of designated city limits? ☒ No ☐ Yes
2. For projects located in Lancaster County: Does the project discharge storm water to Salt Creek, Little Salt Creek or Rock Creek? *If project is not in Lancaster County check **No**.* ☐ No ☒ Yes
3. For all projects: Is this project located in mature oak woodlands within 5 miles of the Missouri River in the area stretching from the Kansas border to Ponca? ☒ No ☐ Yes
4. For all projects: Is this project within 0.25 miles of a *stream of concern* or does it discharge to an stream of concern? (See *Attached Stream Map*) ☒ No ☐ Yes
5. For projects located within the distribution of the American Burying Beetle (See *Attached Map*): Is the project located on potential habitat*? *If it is not within the American Burying Beetle distribution, check **No**.* ☒ No ☐ Yes

   ** Potential habitat constitutes land which has not been previously disturbed, typically by crop agriculture, and land not located within city limits.*

- *If you answered **No** to all questions in Section I, a NDEQ and NG&PC review may not be needed (see disclaimer above). Include this form with your SWPPP documentation.*
- *If you answered **YES** to only question 1, complete Section II.*
- *If you answered **YES** to any of questions 2 thru 5 in Section I, consultation with NDEQ & NG&PC is necessary (Section III).*

Section II

1. Will project construction take place between April 1 and May 10 or October 1 and November 15 in the following locations? ☒ No ☐ Yes
   - In non-urban areas within 3 miles of the Platte, Loup, Middle Loup, North Loup or Niobrara Rivers; or
   - In non-urban areas within 1 mile of a wetland within the Primary Whooping Crane Use area.
2. Will project construction take place between April 1 and June 15 in the following locations? ☒ No ☐ Yes
   - A wheat field or heavily grazed prairie in
     - Kimball County; or
     - Banner County (south of Harrisburg); or
     - Cheyenne County (west of Sidney).
3. Will project construction take place between April 15 and September 15 within 0.25 miles of rivers at the following locations? ☒ No ☐ Yes
   - The Lower Platte River from Columbus to Plattsmouth; or
   - The Missouri River from where it joins the Nebraska/South Dakota state border to Ponca; or
   - The Loup River between St. Paul and Columbus; or
   - The Niobrara River between Springview and where the Missouri and Niobrara Rivers converge.
4. Will project construction take place between April 15 and September 15 in the following locations? ☒ No ☐ Yes
   - An active or recently active sand and gravel operation with bare sand substrate located within 5 miles of the Platte, Loup, South Loup, Middle Loup, North Loup, Niobrara, Elkhorn, or Missouri Rivers.
5. Is the project construction on a non-crop, non-urban site in Pawnee County (west of Pawnee City), Johnson County or Gage County (south of Beatrice)? ☒ No ☐ Yes
6. Is the project construction within 1 mile of the North Platte, Platte, Little Nemaha, Cedar, Loup, South Loup, North Loup, Calamus, Niobrara, Elkhorn Rivers, or Lodgepole Creek from Kimball to the Wyoming State line? ☒ No ☐ Yes
7. Is the project construction on a non-crop, non-urban site in the Swift Fox distribution area? (See *Attached Distribution Map*) ☒ No ☐ Yes
8. Will the project construction impact open active sandy blowouts in Cherry County, the south east quarter of Sheridan County, or the north half of Thomas, Hooker or Grant Counties? ☒ No ☐ Yes
9. Is the project construction within 0.5 miles of the Niobrara River from Highway 29 to the Wyoming state line? ☒ No ☐ Yes
10. Will the project construction impact wet meadows in the Orchid distribution area? (See *Attached Distribution Map*) ☒ No ☐ Yes

♦ *If you answered **No** to all questions in Section II, a NDEQ and NG&PC review may not be needed (see disclaimer above). Include this form with your SWPPP documentation.*

- *If you answered **YES** to any of questions in Section II, consultation with NDEQ & NG&PC is necessary (Section III).*

Section III

- *If you answered Yes to any of the questions in Section I or II, Please complete the information in this section and submit the information to NDEQ.*
- *Questions regarding use of this form may be directed to NDEQ staff at (402) 471-8330.*
- *Questions regarding specific items in Section I or II may be directed to NG&PC staff at (402)471-5444.*

Applicant Information

Project Name: West Haymarket Redevelopment County: Lancaster
Physical Address: n/a Date: _____
Legal Description: SW (Q), Section 23, Township 10 N, Range 6 (E or W)
Latitude: 40°49'05.03" N Longitude: 96°42'51.32" W Method: Geographic Coordinate System WGS1984
Project Contact: Miki Esposito Telephone: 441.6173
Email: mesposito@lincoln.ne.gov

Type of Construction: ☐ Residential ☒ Commercial ☐ Industrial ☐ Linear
☐ Livestock ☐ Other_____

Size of Construction Area: 73 acres Size of Borrow Area: _____ acres
Current Land Use: Industrial – Railroad

Description of Project: *Description should include the general project description. A second page should be used if necessary.*

Map of Project Area: *Topographic and/or aerial maps with the specific project area delineated are encouraged as this will expedite processing time.*

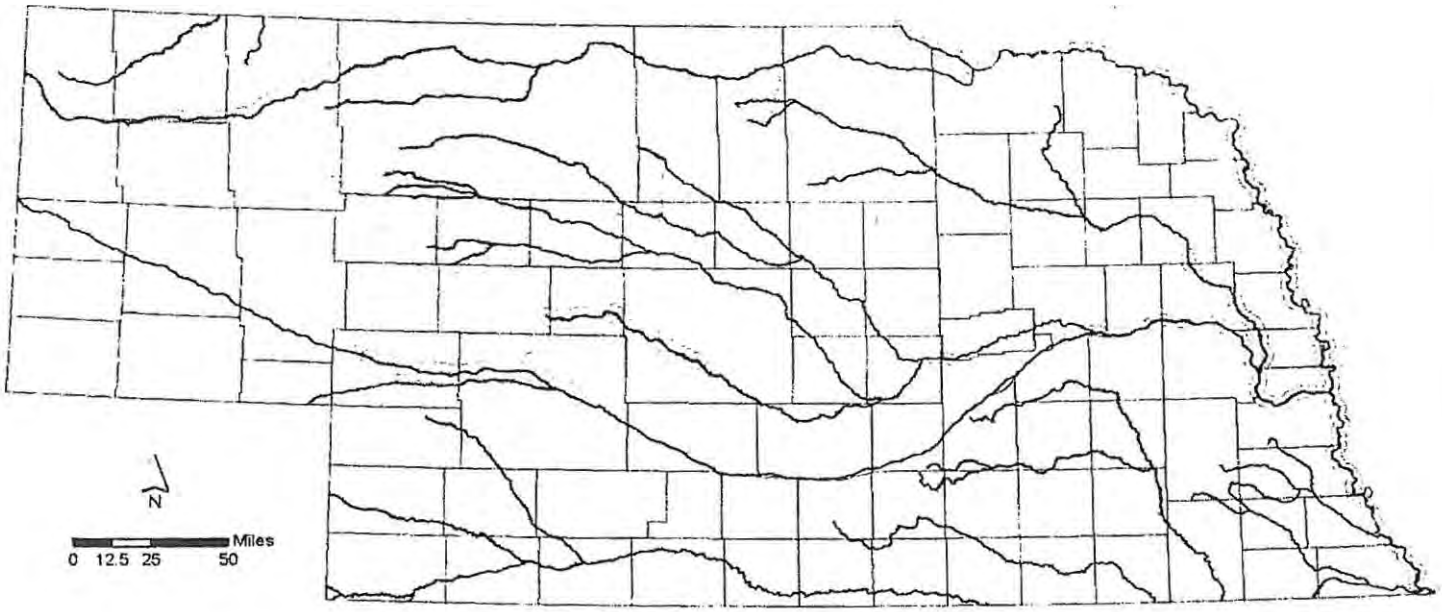
NDEQ:

Water Quality Division
Storm Water
Suite 400, The Atrium
1200 'N' Street
P.O. Box 98922
Lincoln, NE 68509-8922
(402) 471-8330

NG&PC:

Nebraska Game & Parks Commission
Environmental Analyst Supervisor, Heritage Division
2200 North 33rd Street
P.O. Box 30370
Lincoln, NE 68508-2707
(402) 471-5444

Stream and River Reaches of Concern for Nebraska Fish Species



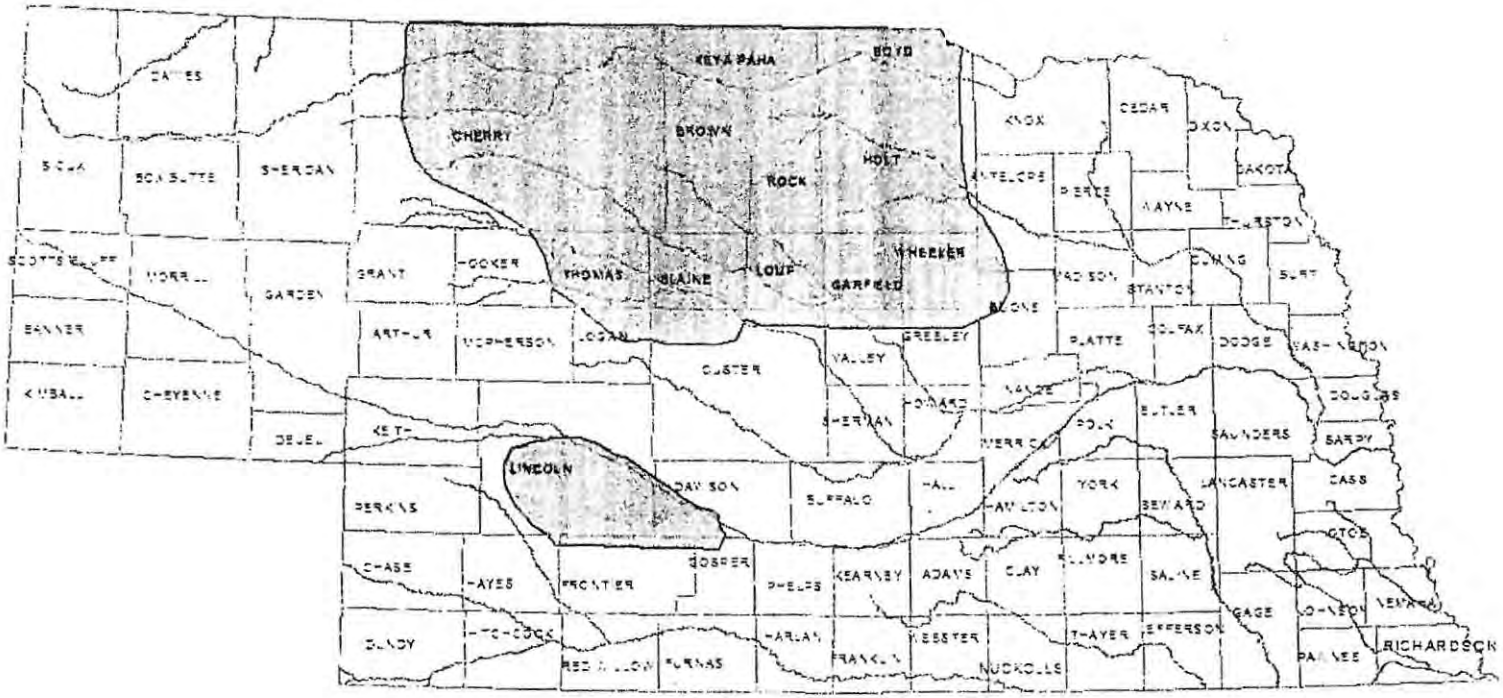
Legend

- Major_Rivers
- Counties
- Areas of Concern

Map produced by the Nebraska Game and Parks Commission
February 19, 2008

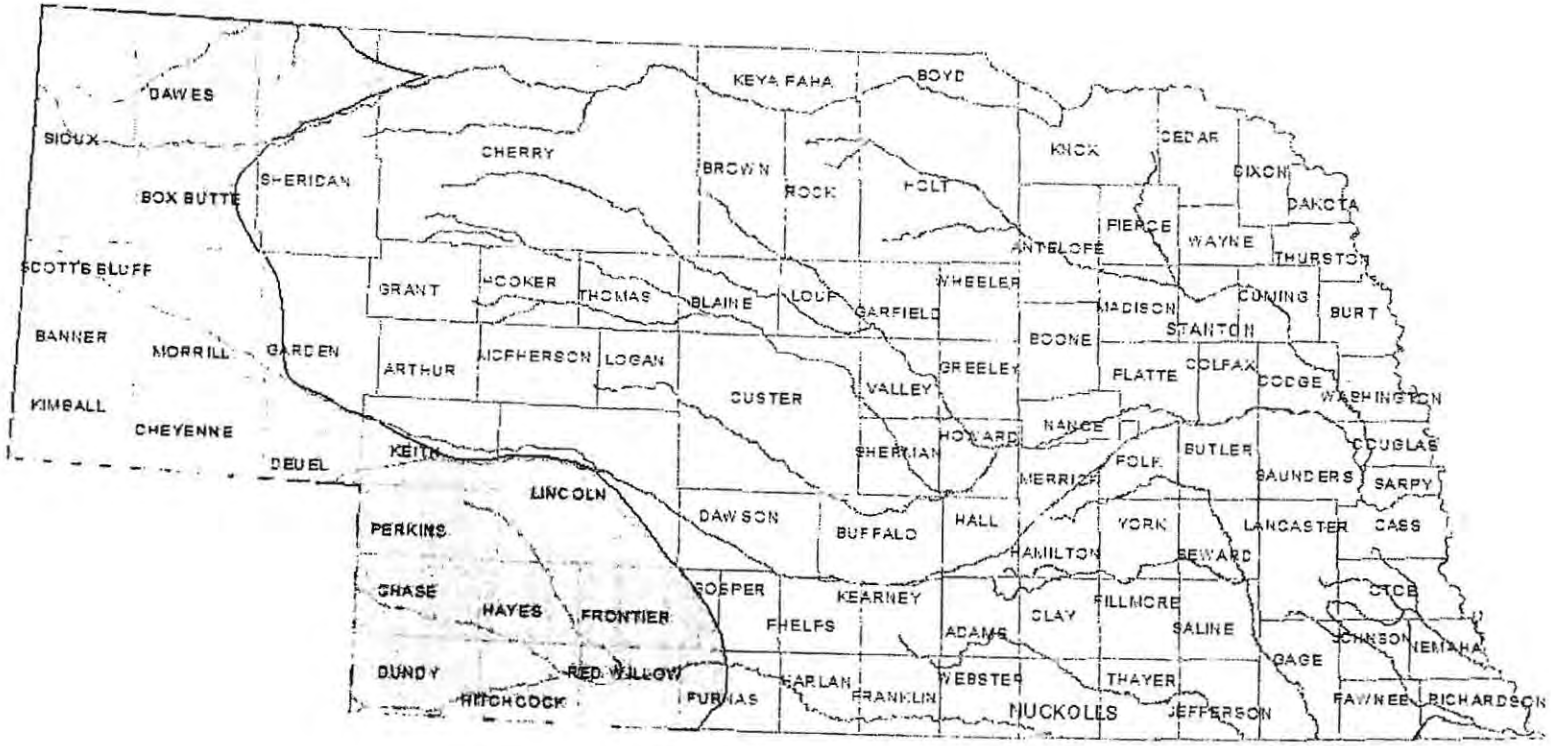
Streams and rivers within shaded areas are of concern for at-risk fish species.

American Burying Beetle Distribution



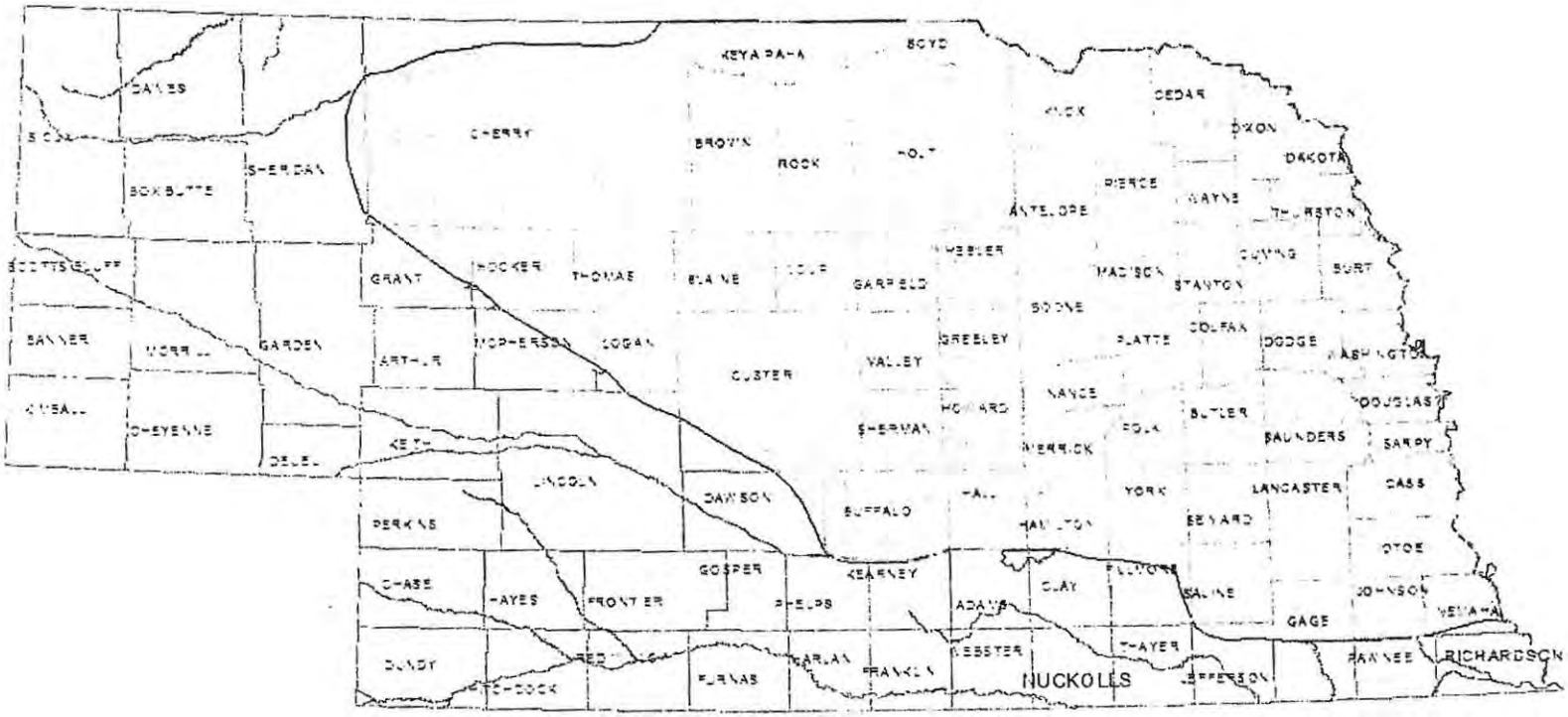
Nebraska Game and Parks Commission 2008

Swift Fox Distribution



Nebraska Game and Parks Commission 2008

Orchid Distribution



Nebraska Game and Parks Commission 2008

STATE OF NEBRASKA

Dave Heineman
Governor

DEPARTMENT OF ENVIRONMENTAL QUALITY
Michael J. Linder
Director
Suite 400, The Atrium
1200 'N' Street
P.O. Box 98922
Lincoln, Nebraska 68509-8922
Phone (402) 471-2186
FAX (402) 471-2909
website: www.deq.state.ne.us

FEB 18 2011

Mr. Chad Blahak
City of Lincoln
Public Works/ Engineering Services
555 South 10th Street
Lincoln, NE 68508

RE: Dewatering Authorization Restrictions Under General National Pollutant Discharge Elimination System (NPDES) NEG671000 for Lincoln Haymarket/Arena Construction
(Area bounded by 2nd Street, Salt Creek Street, 8th Street, and J Street, Lincoln, NE)

Dear Mr. Blahak,

This letter provides requirements for continued authorization under the Department of Environmental Quality's General NPDES Permit for Construction Dewatering (NEG671000). Due to the known pollutants present in groundwater and soils in this area, additional restrictions will be required in order to protect surface water.

The general permit cannot authorize discharge that in accordance with Part I. C of the permit may create potential water quality impacts on the receiving stream. In addition, in accordance with Part IV.B, the permit prohibits toxic discharges. Known toxics have been determined to be present on this site, and therefore, unless there is further analysis of the dewatering water, it cannot be authorized by this permit to discharge. In order to determine whether or not an authorized discharge can take place, the water must be analyzed prior to discharge. Therefore, to continue authorization under NPDES General Permit NEG67100, all work requiring dewatering discharges **must**:

1. Containerize the dewatering water.
2. Test each container for the constituents found in Table 1, 2, and 3.
3. Test results must be completed and compared to maximum discharge levels found in Table 1, 2, and 3.
4. If all test results are **below** maximum discharge levels found in Table 1, 2, and 3 discharge authorization is continued under the NPDES General Permit NEG671000. All other terms and conditions of the permit continue to apply.
5. If any test result is **above** maximum discharge levels found in Table 1, 2, and 3, the discharge is no longer authorized under the NPDES General Permit NEG671000 and is prohibited from direct discharge. Alternate disposition and /or treatment are required.
    a. Approval from a municipal wastewater treatment facility (WWTF) is required prior to discharging to the WWTF. Please be advised that some of the pollutants found on this site may adversely affect the quality of biosolids from the WWTF.
    b. Any type of treatment on site will require a site-specific NPDES permit applicable to the type of treatment and the pollutants treated. A site specific application for this permit will be required. (Form 1 and 2C)
    c. Treatment can be performed by an off-site facility that is designed, permitted, and approved to treat the pollutants present.

6. Test results shall be recorded on the attached Discharge Monitoring Reports (DMR) and submitted to the Department on a quarterly basis. Reports can be sent to the address at the end of the DMR form.

Table 1: Requirements for Dieldrin, PCBs, and TPH

Parameters	Storet #	Units	Maximum Discharge Levels	Frequency	Sample Type
Dieldrin	39380	µg/L	0.00144	Once/batch	Grab
Polychlorinated Biphenyls	39516	µg/L	0.0017	Once/batch	Grab
Total Petroleum Hydrocarbons	82180	mg/L	10	Once/batch	Grab

Table 2: Requirements for Metals

Parameters	Storet #	Units	Maximum Discharge Levels	Monitoring Frequency	Sample Type
Arsenic, Total Recoverable	00978	µg/L	16.7	Once/batch	Grab
Cadmium, Total Recoverable	01113	µg/L	0.527	Once/batch	Grab
Chromium (III), Total Recoverable	04262	µg/L	189.5	Once/batch	Grab
Chromium (VI), Total Recoverable	78247	µg/L	11.0	Once/batch	Grab
Lead, Total Recoverable	01114	µg/L	8.1	Once/batch	Grab
Mercury, Total Recoverable	71901	µg/L	0.77	Once/batch	Grab
Selenium, Total Recoverable	00981	µg/L	5.0	Once/batch	Grab

Table 3: Requirements for Polycyclic Aromatic Hydrocarbons					
Parameters	**Storet #**	**Units**	**Maximum Discharge Levels**	**Monitoring Frequency**	**Sample Type**
Benzo(a)antracene	34526	µg/L	0.49	Once/batch	Grab
Benzo(a)pyrene	34247	µg/L	0.49	Once/batch	Grab
Benzo(b)fluoranthene	34230	µg/L	0.49	Once/batch	Grab
Benzo(k)fluoranthene	34242	µg/L	0.49	Once/batch	Grab
Chrysene	34320	µg/L	0.49	Once/batch	Grab
Dibenzo(a,h)anthracene	34556	µg/L	0.49	Once/batch	Grab
Indeno(1,2,3-cd)pyrene	34403	µg/L	0.49	Once/batch	Grab
Naphthalene	34696	µg/L	620	Once/batch	Grab

These additional restrictions must be satisfied to qualify for authorization under the NPDES General Dewatering Permit NEG 671000 for construction dewatering activity in the area bounded by 2nd Street, Salt Creek Street, 8th Street and J Street, Lincoln, NE and are effective immediately. Please contact me if you have questions.

Sincerely,

Donna K. Garden

Donna K. Garden, Supervisor
NPDES Permits and Compliance Unit
Wastewater Section
402-471-1367
donna.garden@nebraska.gov

cc: T. J. Osborn Construction, 5801 Johanna Road, Lincoln, Nebraska 68507 (402-464-4235)
Frank Uhlarik , Alfred Benesch and Co., 825 J Street, PO Box 80358, Lincoln, Nebraska 68501
Miki Esposito, City of Lincoln, 555 South 10th Street, Lincoln, NE 68508

Nebraska Department of Environmental Quality

Wastewater Section
1200 'N' Street, Suite 400, The Atrium
PO Box 98922
Lincoln, NE 68509-8922
Tel. 402/471-4220
(a) Fax 402/471-2909

DW-DMR

Dewater Discharges Discharge Monitoring Report (DMR) Authorized Under NPDES General Permit NEG671000

This DW-DMR is to be submitted monthly (i.e., within 28 days after the end of each calendar month), unless alternative submittal arrangements are approved. Any pH, Oil & Grease, or Total Suspended Solids monitoring results that are not in compliance with the permit effluent limits shall be reported to the Department within 24 hours (Telephone 402/471-4220) and a written non-compliance report must be submitted within 7 days (See Appendix A, Sections D.2 and D.3 in the permit). If the appropriate information is included on this form, it may be used as a non-compliance report form and to provide notification of project completion. Be sure to fill in all of the appropriate blanks below and sign on the back of this form.

NPDES Tracking Number: NEG671 ____ _____ _____ - R

Project Owner or Operator: _____

Project Name & Location: _____

When is the discharge anticipated to begin? (mo/day/yr) _____

What is the Outfall Designations:_____

What is the Source of the outfall? (i.e. well, pit, foundation pump, etc.)_____

_____

Discharge Monitoring Report_____ Date_____

Site_____

Parameter	Discharge Limit	Unit	Monitoring Result	Unit	Sample Type
Volume Discharged	Report	Gallons			
Dieldrin	0.00144	µg/L			
Polychlorinated Biphenyls	0.0017	µg/L			
Total Petroleum Hydrocarbons	10.0	mg/L			

Parameter	Discharge Limit	Unit	Monitoring Result	Unit	Sample Type
Arsenic, Total Recoverable	16.7	µg/L			
Cadmium, Total Recoverable	0.527	µg/L			
Chromium (III), Total Recoverable	189.0	µg/L			
Chromium (VI), Total Recoverable	11.0	µg/L			
Lead, Total Recoverable	8.1	µg/L			
Mercury, Total Recoverable	0.77	µg/L			
Selenium, Total Recoverable	5.0	µg/L			

Parameter	Discharge Limit	Unit	Monitoring Result	Unit	Sample Type
Benzo(a)anthracene	0.49	µg/L			
Benzo(a)pyrene	0.49	µg/L			
Benzo(f)fluoranthene	0.49	µg/L			
Benzo(k)fluoranthene	0.49	µg/L			
Chrysene	0.49	µg/L			
Dibenzo(a,h)anthracene	0.49	µg/L			
Indeno(1,2,3-cd)pyrene	0.49	µg/L			
Naphthalene	620	µg/L			

Certification

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

Owner or Operator Signature or Authorized Representative** **Date Signed**

Print Name **Title**

For Information on the submittal of the DW-DMR see page 4.
The qualifications and responsibilities of the authorized representative are described on page 4.
Requirements for and Responsibilities of Owner/Operator and Authorized Representative

The "**owner or operator**" is responsible for signing all permit applications and must meet the requirements set forth in NDEQ Title 119 Chapter, 13 002:

"All permit applications submitted to the Department shall be signed:

002.01 – For a corporation, by a responsible corporate officer;

002.02 - For a partnership or a sole proprietorship by a general partner or the proprietor; and

002.03 - For a municipal, State, Federal, or other public facility by either a principal executive officer or ranking elected official."

The "**authorized representative**" is the primary facility contact for correspondence and monitor reporting, and must meet the requirements set forth in NDEQ Title 119, Chapter 13 003:

"All other correspondence, reports and DMR's shall be signed by a person designated in 001.01 through 001.04 above or a duly authorized representative if such representative is responsible for the overall operation of the facility from which the discharge originates; the authorization is made in writing by the person designated under 001.01 through 001.03 above; and the written authorization is submitted to the Director."

Submit the completed DW-DMR form to one of the following addresses:

US Postal Service Address

Wastewater Section
Nebraska Department of Environmental Quality
PO Box 98922
Lincoln, NE 68509-8922

Alternate Carrier Address

Wastewater Section
Nebraska Department of Environmental Quality
The Atrium, 1200 N Street, Suite 400
Lincoln, NE 68509

STATE OF NEBRASKA

Dave Heineman
Governor

DEPARTMENT OF ENVIRONMENTAL QUALITY
Michael J. Linder
Director
Suite 400, The Atrium
1200 'N' Street
P.O. Box 98922
Lincoln, Nebraska 68509-8922
Phone (402) 471-2186
FAX (402) 471-2909
website: www.deq.state.ne.us

MAR 25 2011

Mr. Chad Blahak
City of Lincoln
Public Works/ Engineering Services
555 South 10th Street
Lincoln, NE 68508

RE: Dewatering Authorization Restrictions Under General National Pollutant Discharge Elimination System (NPDES) NEG671000 for Lincoln Haymarket/Arena Construction Revised 3/24/2011
(Area bounded by 2nd Street, Salt Creek Street, 8th Street, and J Street, Lincoln, NE)

Dear Mr. Blahak,

This letter provides requirements for continued authorization under the Department of Environmental Quality's General NPDES Permit for Construction Dewatering (NEG671000). Due to the known pollutants present in groundwater and soils in this area, additional restrictions will be required in order to protect surface water.

The general permit cannot authorize discharge that in accordance with Part I. C of the permit may create potential water quality impacts on the receiving stream. In addition, in accordance with Part IV.B, the permit prohibits toxic discharges. Known toxics have been determined to be present on this site, and therefore, unless there is further analysis of the dewatering water, it cannot be authorized by this permit to discharge. In order to determine whether or not an authorized discharge can take place, the water must be analyzed prior to discharge. Therefore, to continue authorization under NPDES General Permit NEG67100, all work requiring dewatering discharges **must**:

1. Containerize the dewatering water.
2. Test each container for the constituents found in Table 1, 2, and 3.
3. Test results must be completed and compared to maximum discharge levels found in Table 1, 2, and 3.
4. If all test results are **below** maximum discharge levels found in Table 1, 2, and 3 discharge authorization is continued under the NPDES General Permit NEG671000. All other terms and conditions of the permit continue to apply.
5. If any test result is **above** maximum discharge levels found in Table 1, 2, and 3, the discharge is no longer authorized under the NPDES General Permit NEG671000 and is prohibited from direct discharge. Alternate disposition and /or treatment are required.
    a. Approval from a municipal wastewater treatment facility (WWTF) is required prior to discharging to the WWTF. Please be advised that some of the pollutants found on this site may adversely affect the quality of biosolids from the WWTF.
    b. Any type of treatment on site will require a site-specific NPDES permit applicable to the type of treatment and the pollutants treated. A site specific application for this permit will be required. (Form 1 and 2C)

c. Treatment can be performed by an off-site facility that is designed, permitted, and approved to treat the pollutants present.

1. Test results shall be recorded on the attached Discharge Monitoring Reports (DMR) and submitted to the Department on a quarterly basis. Reports can be sent to the address at the end of the DMR form.

Table 1: Requirements for Dieldrin, PCBs, and TPH

Parameters	Storet#	Units	Maximum Discharge Levels	Frequency	Sample Type
Dieldrin	39380	µg/L	0.00144	Once/batch	Grab
Polychlorinated Biphenyls	39516	µg/L	ND[a]	Once/batch	Grab
Total Petroleum Hydrocarbons	82180	mg/L	10	Once/batch	Grab

[illegible]

Table 2: Requirements for Metals

Parameters	Storet#	Units	Maximum Discharge Levels	Monitoring Frequency	Sample Type
Arsenic, Total Recoverable	00978	µg/L	16.7	Once/batch	Grab
Cadmium, Total Recoverable	01113	µg/L	0.527	Once/batch	Grab
Chromium (III), Total Recoverable	04262	µg/L	189.5	Once/batch	Grab
Chromium (VI), Total Recoverable	78247	µg/L	11.0	Once/batch	Grab
Lead, Total Recoverable	01114	µg/L	8.1	Once/batch	Grab
Mercury, Total Recoverable	71901	µg/L	0.77	Once/batch	Grab
Selenium, Total Recoverable	00981	µg/L	5.0	Once/batch	Grab

Table 3: Requirements for Polycyclic Aromatic Hydrocarbons					
Parameters	Storet #	Units	Maximum Discharge Levels	Monitoring Frequency	Sample Type
Benzo(a)antracene	34526	µg/L	0.49	Once/batch	Grab
Benzo(a)pyrene	34247	µg/L	0.49	Once/batch	Grab
Benzo(b)fluoranthene	34230	µg/L	0.49	Once/batch	Grab
Benzo(k)fluoranthene	34242	µg/L	0.49	Once/batch	Grab
Chrysene	34320	µg/L	0.49	Once/batch	Grab
Dibenzo(a,h)anthracene	34556	µg/L	0.49	Once/batch	Grab
Indeno(1,2,3-cd)pyrene	34403	µg/L	0.49	Once/batch	Grab
Naphthalene	34696	µg/L	620	Once/batch	Grab

All of these values with the exception of PCBs are based on Title 117 – Nebraska Surface Water Standards and are the most stringent values allowable. PCB is based on minimum detection levels for EPA approved test method 608. Any detection of the congeners of PCBs will prohibit discharge.

These additional restrictions must be satisfied to qualify for authorization under the NPDES General Dewatering Permit NEG 671000 for construction dewatering activity in the area bounded by 2nd Street, Salt Creek Street, 8th Street and J Street, Lincoln, NE and are effective immediately. Please contact me if you have questions.

Sincerely,

Donna K Garden

Donna K. Garden, Supervisor
NPDES Permits and Compliance Unit
Wastewater Section
402-471-1367
donna.garden@nebraska.gov

cc: Frank Uhlarik , Alfred Benesch and Co., 825 J Street, PO Box 80358, Lincoln, Nebraska 68501,
Miki Esposito, City of Lincoln, 555 South 10th Street, Lincoln, NE 68508

ADDENDUM NO. 5

WEST HAYMARKET JOINT PUBLIC AGENCY
HAYMARKET INFRASTRUCTURE IMPROVEMENT
INTITIAL HAYMARKET SITE PREPARATION
PROJECT NO. 870703
BID NO. 11-079

Addenda are instruments issued by the Purchasing Office prior to the date or time for receipt of offers which will modify or interpret the specifications document by addition, deletion, clarification or correction.

Please acknowledge receipt of this addendum in the space provided in the Attribute Section.

Please be advised of the following changes and clarifications to the City's specification and bidding documents:

1. The bid form has been updated from the revised bid form issued under Addendum No. 4 as follows:

   The following bid item has been deleted:

50.0035	Grading and Placement of Beneficial Reuse Soils	62,783 TON

   The following bid items have been added:

50.0010	Grading and Placement of Beneficial Reuse Soils	62,783 CY

Note: The bid item "Grading and Placement of Beneficial Reuse Soils" is a fixed price item with a set price of $1.25 per cubic yard.

Dated this 18th day of April, 2011.

This document was originally issued and sealed by Thomas A. Lekam, 6:07:10, on 4-18-11. This media should not be considered a certified document.

Environmental Contingency Plan
West Haymarket Redevelopment Site

Prepared for:

The Joint Public Agency of Lincoln, Nebraska

Benesch Project Number: 110058.00.00006

Revision 2 March 18, 2011

Prepared by:

benesch
engineers · scientists · planners

Alfred Benesch & Company
14748 West Center Road, Suite 100
Omaha, NE 68144
P: (402) 333-5792
F: (402) 333-2248

In consultation with

OLSSON ASSOCIATES and EnviroGroup Limited

SPILL/INCIDENT RESPONSE REFERRAL SHEET

Note: Waste/excess soil or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed below:

SPILL REPORTING

(Through City of Lincoln Environmental Project Management Team Decision Authority as described in Section 3.3 of the ECP)

First Call: Environmental Project Management Team Technical Representatives:

Frank Uhlarik – Alfred Benesch & Company:	**402-333-5792**
	Cell: 402-669-0546

Alternate:

Bill Imig – Olsson Associates:	**402-458-5903**
	Cell: 402-314-4568

Alternate:

Miki Esposito – Environmental Project Management Team: 402-441-6173

Agencies/Railroad Authorities:

Nebraska Department of Environmental Quality:	**402-471-2186 or 877-253-2603**
After Hours, Weekends and Holidays:	
Nebraska State Patrol Dispatch:	**402-471-4545**
BNSF Railway Company Resource Operations Center:	**800-832-5452**
Union Pacific Railroad Security:	**888-877-7267**
National Response Center:	**800-424-8802**

ALL OTHER INCIDENTS

Fire and Police: Dial 911

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FIGURES

Figure 1 Project Location

Figure 2 WHRS Area Boundaries

Figure 3a North Area Soil Impacts (in Packet)

Figure 3b South Area Soil Impacts (in Packet)

Figure 4a North Area Groundwater Impacts (in Packet)

Figure 4b South Area Groundwater Impacts (in Packet)

Figure 5 Wetland Map

TABLES

Table 1 Potential Wetland Disturbance Activities

Table 2 Common Wetland Avoidance Measures

Table 3 Wetland Impact Minimization Measures

ATTACHMENTS

Attachment 1 Chemical Information

Attachment 2 Project Forms

Attachment 3 Project – Specific Authorizations

LIST OF ACRONYMS

CERCLA	Comprehensive Environmental Response Compensation and Liability Act
COPC	Chemicals of Potential Concern
CR	Contractor's Representative
ECP	Environmental Contingency Plan
EPMT	City of Lincoln Environmental Project Management Team
PCBs	Polychlorinated Biphenyls
PM	Project Manager
SVOCs	Semi-volatile Organic Compounds
TR	Environmental Project Management Team Technical Representative
VOCs	Volatile Organic Compounds
WHRS	West Haymarket Redevelopment Site

1.0 PURPOSE

The purpose of this Project Environmental Contingency Plan (ECP) is to prescribe management procedures and preventive measures relevant to areas and activities associated with construction within the West Haymarket Redevelopment Site (WHRS) that present the potential for environmental impacts or regulatory concerns if not properly controlled. The ECP is further intended to provide the City of Lincoln's Environmental Project Management Team (EPMT) with a mechanism for centralized management and documentation control of environmental matters – most specifically related to management of impacted soils or other contaminated media throughout the duration of planned WHRS projects.

2.0 SCOPE

2.1 Background

The WHRS and surrounding area has been home to large scale industrial and commercial operations for over a century including railroad thru-freight and switching, locomotive and railcar servicing/repair, manufactured gas plant operations, tanneries, paint and pigment manufacturing and scrap processing. Environmental and geotechnical investigations performed within the WHRS in recent years have identified the presence of petroleum constituents, heavy metals, polychlorinated biphenyls (PCBs), and a variety of fuel and chemical components and breakdown products classified under the general categories of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) in soil and/or groundwater.

In some areas, the levels of constituent impacts in soil or groundwater have been documented to exceed health-based standards established by the Environmental Protection Agency (EPA) and/or Nebraska Department of Environmental Quality (NDEQ). These standards are established under differing assumptions of life-long exposure using residential and commercial/industrial scenarios and do not necessarily represent threats to human health under instantaneous or short term exposure as may be the case under a construction worker exposure scenario. The known presence of these constituents in certain defined areas and their potential occurrence in areas not yet thoroughly investigated, however, presents a scenario for human exposure and/or corollary environmental or regulatory impacts that must be avoided in order to 1) protect human health and the environment and 2) minimize disruptions and cost impacts to the overall WHRS project.

2.2 Applicability

The location of the project and general boundary of redevelopment activity are depicted in Figures 1 and 2, respectively. The boundary in Figure 2 represents tentatively planned redevelopment footprints which is <u>not</u> strictly defined or intended to restrict applicability of this ECP to related WHRS construction activities outside of the boundary. Figures 3 and 4 provide a representation of soil boring and groundwater monitoring well data showing values in soil or groundwater, respectively, that exceed health-based standards referenced in Section 2.1 of this ECP. ***With the exception of the free-product diesel fuel plume depicted northwest of the Lincoln Depot, there is no representation or assumption that impacts are continuous***

between affected borings, nor is there a representation or assumption that impacts do <u>not</u> occur between borings represented as below health-based standards.

A tentative list of the suspected chemicals of potential concern (COPC) known to have been detected in site soils and/or groundwater along with representative chemical profiles is included as Attachment 1. The preponderance of COPC occurrence consists of petroleum, petroleum constituents, traces of heavy metals (some – largely arsenic believed to be naturally occurring) VOCs, SVOCs and limited occurrences of PCBs. Compounds detected are common to railroad operations, former manufactured gas plant operations and/or scrap operations which encompass the major focus of investigations in the WHRS.

The scope of preventive measures and management procedures prescribed in this ECP are designed to cover all intrusive work in the WHRS. Intrusive work activities include (but are not limited to):

- Excavation
- Grading
- Drilling
- Boring
- Utility Trenching
- De-watering

This ECP does not address standard safety – related activities and programs such as confined space entry, electrical safety, fall protection, etc. regulated by the Federal Occupational Health and Safety Administration (OSHA under 29 CFR 1910). Project safety policies, procedures and compliance are the responsibility of the respective organizations and personnel who have cause to be in the project area in some official capacity or employment including railroads, City of Lincoln employees, regulatory agencies, contractors, consultants, and other suppliers of services to the project. The need for safety – specific precautions (including the potential for vapors in excavations and utility corridors) should, however be discussed during pre-construction briefings.

Section 4.0 of this ECP describes management procedures and required preventive measures to be followed by all personnel involved in WHRS construction activities.

Note: Waste/excess soil, sludge or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed in the table in Section 3.1 and on the Spill/Incident Referral Sheet at the beginning of this document.

3.0 ECP MANAGEMENT

3.1 Roles and Responsibilities

This ECP has been prepared for and will be managed by the City of Lincoln's Environmental Project Management Team (EPMT) led by the Public Works Liaison & Compliance Administrator. The EPMT has contracted with Alfred Benesch & Company (Benesch) to provide environmental consulting services including preparation and implementation of the ECP.

Specifically, as an agent or technical representative (TR) of the EPMT, Benesch will:

- Prepare and amend the ECP as needed
- Disseminate the ECP to key stakeholders in the WHRS Project(s)
- Provide project/task start-up briefings when applicable (see Section 2.2)
- Provide compliance verification relative to handling of impacted soils/other media
- Provide on-call incident assistance to Project Managers (PM) and Contractor's Representatives (CR) including sampling and analysis of suspect materials

The EPMT in turn provides routine coordination and support to the WHRS Program Manager in terms of environmental issues related to the overall WHRS project. Roles and responsibilities of the EPMT and WHRS Program Manager as well as other key stakeholders in the WHRS project with an interest and responsibility in conforming to this ECP are described in the table below:

Organization	Role	Responsibility	Contact
WHRS Program Manager	Overall WHRS program execution	Support conformance to the ECP	Jim Martin 417-251-1695 Jim.martin@benham.com
City of Lincoln EPMT	Overall WHRS environmental performance	Prepare and oversee execution of the ECP	Miki Esposito 402-441-6173 mesposito@lincoln.ne.gov
Benesch/Olsson Associates	Technical Representative to EPMT	Prepare and oversee execution of the ECP	Frank Uhlarik 402-669-0546 fuhlarik@benesch.com Bill Imig (402) 314-4568 bimig@oaconsulting.com
BNSF	Landowner, Project Manager	Support conformance to the ECP by BNSF work forces and contractors	Greg Jeffries 763-782-3490 Gregory.jeffries@bnsf.com Gerald Maczuga 402-458-7537 Gerald.maczuga@bnsf.com
Contractors	Performance of any construction work in WHRS	- Attend pre-construction briefings on ECP - Comply with ECP	As identified by City, BNSF or other Property Owners within the WHRS
NDEQ	Regulatory Authority	Provide advice to EPMT regarding compliance requirements	Mike Felix 402-471-2938 Mike.felix@nebraska.gov

3.2 Documentation and Control

The following forms (included in Attachment 2) are to be used in maintaining and documenting compliance with the ECP:

ECP-1: Contractor Certification of Receipt and Special Precautions

This form will be reviewed and signed by the PM or CR certifying that he/she has received a copy of the ECP and agrees to comply with applicable work practices. In addition, task-specific precautions pertaining to COPCs, likely areas/volumes of impacted soil to remove, potential re-use of material as fill, etc. are to be documented on this form reflecting agreed upon

procedures for the project and task between the contractor and TR. The Form ECP-1 will be co-signed by the TR.

ECP-2: Incident Log

This form will be filled out by the TR to record "incidents" and any follow-up corrective actions. "Incidents" will generally refer to observed or reported deviations from standard construction procedures, plans and specifications including, the following:

- Spills or discharges of hazardous substances, petroleum or equipment wash water/wastewater released to the environment associated with construction activities.
- Any observed or reported encounter with visibly or otherwise apparent impacted soil, groundwater, surface water or sediment contamination resulting from intrusive activities (grading, excavating, drilling, boring, utility work).
- Encroachment/impact upon defined wetland areas as further discussed in Section 4.2.

It is the responsibility of all stakeholders listed above in their capacity as project managers and contractors to comply with the provisions of the ECP and ensure notifications are made to the hierarchy of contacts listed on the Spill/Incident Response Referral Sheet found at the beginning of this ECP. Each contractor/stakeholder shall designate one responsible point of contact and one alternate for reporting incidents to ensure uniform and consistent control and reporting of information and to avoid duplicative or superfluous reporting.

Incident reporting in itself is not a cause for work stoppage – merely a notification to the EPMT of a condition that may require further investigation, evaluation through sampling/testing or other approved methods of determination and documented resolution by the TR. ***It is not the role of the TR to direct or in any way affect work stoppage. Work stoppage will be dictated solely by the project manager or contractor's representative based on his or her corporate health and safety policies and procedures.***

Copies of all completed Forms ECP-1 and ECP-2 will be maintained by the TR at the Benesch offices located at 825 "J" Street in Lincoln, NE.

3.3 Regulatory Reporting

The need for reporting releases to State, Federal or Local authorities will be determined by the EPMT in consultation with the BNSF or other landowners potentially impacted by the release. Required reporting contacts are listed on the Spill/Incident Response Referral Sheet found at the beginning of this ECP. The following reporting guidelines have been extracted from NDEQ Title 126 - Rules and Regulations Pertaining to Management of Waste, Chapter 18 – Releases of Oil or Hazardous Substances which will be used by the EPMT in determining the need to report incidents:

002 Release Notification Requirements:

002.01 It shall be the duty of any responsible person to notify the Department of any release or suspected release of an oil or hazardous substance, in the following manner:

002.01A Immediate notification is required regardless of the quantity of an oil or hazardous substance release which occurs beneath the surface of the land or impacts or threatens waters of the state or threatens the public health and welfare.

002.01B **Immediate notification is required** of a release upon the surface of the land of an **oil in a quantity that exceeds 25 gallons**, or of a **hazardous substance** which equals or exceeds **100 pounds or its reportable quantity** under Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended (40 CFR Part 302) and Section 329(3) of the Emergency Planning and Community Right-to-Know Act of 1986 (40 CFR Part 355), whichever is less.

002.01B1 Notification is **not required** for a release under this subsection if either of the following conditions is met:

002.01B1a The release is confined and expected to stay confined within a building or otherwise wholly enclosed structure, owned by the responsible party, in which the floors and walls are of non-earthen materials which are adequately impervious to the released substance(s) and is cleaned up within 24 hours of its discovery, or
002.01B1b The release is in compliance with conditions established in State statutes, regulations or permits.

002.01C Notification is **not required** for any release upon the surface of the land of oil or hazardous substance that does not exceed the reportable quantities in 002.01B above and which will not constitute a threat to public health and welfare, the environment, or a threat of entering the waters of the state and provided that the release is cleaned up.

002.02 Notification shall be made by telephone to the Department during office hours, from 8:00 a.m. to 5:00 p.m. Monday through Friday. After hours and holidays, reports shall be made to the Nebraska State Patrol (***numbers listed in the Spill/Incident Referral Sheet at the beginning of this Plan***). All information known about the release at the time of discovery is to be included, such as time of occurrence, quantity and type of material, location and any corrective or cleanup actions presently being taken.

Note: Waste/excess soil, sludge or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed in the table in Section 3.1 and on the Spill/Incident Referral Sheet at the beginning of this document.

4.0 WORK PROCEDURES

4.1 Access

Access to the WHRS is restricted to railroad and City of Lincoln personnel and contractors conducting work in their official capacity as employees or contractors of their respective

organizations. Access to Railroad operating property for purposes of providing construction – related services is subject to specific safety and rules training certifications and requirements found at: **www.contractororientation.com**. Access to other non-railroad private property for purposes of performing construction – related services within the WHRS must be arranged through the EPMT.

4.2 Best Management Practices

In general, PMs and CRs are accountable for obtaining applicable permits and authorizations for project activities under their purview including:

- Storm Water NPDES Construction Permits
- Flood Plain Permits
- Wetland (Section 404) Permits
- Special Waste Disposal Approval (Lincoln Lancaster County Health Department (LLCHD) or other entity that will receive the waste) for impacted soils/debris
- Dewatering Permit for Deep Excavations and Utilities (NPDES)
- State Historic Preservation Office (SHPO) Coordination

Some permits/authorizations (such as the Wetland Section 404 Permit) have been or will be obtained from the regulatory agency by the City of Lincoln for the WHRS. Special waste disposal will also be coordinated by and with the EPMT, however, PMs and CRs must be aware of and comply with provisions associated with these permits/authorizations.

Due to the potential risks and penalties involved in management of impacted media and protection of rare and unique saline wetlands as well as the wide applicability of these issues to planned construction activity, prescriptive management practices for these areas are as follows:

4.2.1 Impacted Soil and Debris Management

1. A fundamental premise regarding the regulatory status of any soils, debris or other media encountered during intrusive activities is that such items are not considered waste material until determined by the ***PM or CR in consultation with the TR*** to be no longer suitable for its intended purpose.

2. Title 132, Chapter 1, Section 041 defines fill as: *"solid waste that consists only of one or more of the following: sand, gravel, stone, soil, rock, brick, concrete rubble, asphalt rubble, or similar material".*

3. The *"use of fill for legitimate land improvement (backfilling a foundation) is allowed per Title 132, Chapter 2, Section 002.01 as long as the fill is not mixed with other solid wastes that have the potential to cause contamination that may threaten human health or the environment".*

4. In accordance with Federal and State regulations and guidance, routine trench or foundation excavation spoils that are generated at a site are not considered a waste unless it is intended for disposal. Such spoils can normally be replaced in the excavation.

It should be noted, however that any suspect material encountered during trench and foundation excavation must be inspected by the TR and only replaced if deemed by the TR not to be a vapor hazard within the utility corridor or building being constructed.

5. Prior to initiation of each construction task, the project manager or contractor's representative will consult with the TR to determine the type of material anticipated to be excavated, potential contaminants of concern (if any) and allowable re-use (including use as fill), alternatives to be employed for excess soil or debris to be generated associated with his/her respective work task. Provisions for temporary storage of potentially impacted soil/debris must be explicitly agreed upon. A written summary of these determinations is to be included in the Form ECP-1 completed for the work effort and filed according to procedures listed in Section 3.2 above.

6. On March 8, 2011, the NDEQ issued a guideline for management of excess soils for various activities within the WHRS covered under this ECP. Any discrepancies between NDEQ guidance and what is prescribed in the ECP must be resolved with the TR. The guidance is in Attachment 3.

7. A special waste authorization has been obtained from the Lincoln/Lancaster County Health Department for disposal of specified petroleum – impacted soils at the City of Lincoln's Bluff Road Landfill. This authorization is included in Attachment 3 and may only be used when approved by the TR.

Note: Waste/excess soil, sludge or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed in the table in Section 3.1 and on the Spill/Incident Referral Sheet at the beginning of this document.

4.2.1.1 *Investigative Drilling/Boring*

Drilling investigations conducted under the supervision and oversight of the NDEQ under the Voluntary Cleanup Program or Title 200 Programs require preparation of specific investigation work plans to address drill cuttings and other "Investigation – Derived Wastes" (IDW). This effort is managed by the TR and will follow established work plan protocols.

Geotechnical investigations (GI) within the WHRS will require conformance to the following management practices:

1. The GI Project Manager must contact the TR at least 7 days prior to drilling to discuss anticipated conditions and any special precautions to consider.

2. The GI Project Manager must arrange for all utility clearance.

3. The GI Project Manager will complete Form ECP-1 in consultation with the TR.

4. A TR must be on-site or on call to respond to questions or observations that could require sampling or determinations relevant to management of soil cuttings.

5. Unless superseded by other special considerations (such as drilling in known or highly suspected areas of impacted soils/groundwater), drilling procedures and soil cuttings management may proceed under standard GI processes and procedures including boring abandonment.

6. If during the completion of the boring the drill crew encounters potentially impacted soils, cuttings will be placed on plastic sheeting and segregated from non-impacted cuttings. Work shutdown will be at the discretion of the GI Project Manager's corporate health and safety policies and practices.

7. At the conclusion of the boring, impacted soil cuttings should be placed back in the boring at the relative depth/order which retrieved. The surface should be sealed with a minimum of three ft. of bentonite/cement slurry and if within 100ft. of a planned building should ideally extend from the surface to the depth of identified impacts.

8. Any remaining impacted soil cuttings will be sampled and analyzed as determined by the TR and instructions provided to the GI Project Manager for proper handling of the material. Cuttings must remain on plastic sheeting and covered with plastic or placed in sealed drums and labeled with the boring number until directions for further handling are provided by the TR.

9. Upon final resolution, the TR will complete and file an ECP-2 form relative to any IDW disposed of off-site or additional activities resulting in on-site re-use or application (land-spreading) of drill cuttings.

4.2.1.2 *Grading/Excavation*

Grading and excavating activities conducted under the supervision and oversight of the NDEQ under the Voluntary Cleanup Program or Title 200 Programs require preparation of specific remedial action work plans to address management of impacted soils and debris. This effort is managed by the TR and will follow established work plan protocols.

All other construction grading and excavation activities associated with applicable WHRS project activities require coordination and ECP compliance as follows:

1. Grading/excavation project manager/contractor's representative (PM/CR) must contact the TR at least 14 days prior to initiation of grading/excavation work to discuss anticipated conditions and any special precautions to consider.

2. The PM/CR must arrange for all utility clearance.

3. The PM/CR must meet with the TR to discuss task – specific precautions (as detailed in any and all applicable work activities described in this Section 4.2), complete and sign Form ECP-1 and provide to the TR for co-signature and filing.

4. A TR must be on-site or on call to respond to questions or observations that could require sampling or determinations relevant to management of impacted soil or debris. ***It is the responsibility of the PM/CR to notify the TR of construction schedules and activities (including any changes in schedules or scope of work effort) that may require on-site support and observation***.

5. Unless superseded by other special considerations (documented in ECP-1), grading/excavation activities may proceed per the contractual project/task plans and specifications.

6. Changing field considerations and observations (including encountering suspect soils/debris/other media or modifications of proposed areas/volumes of soil grading/excavation/filling) must be reported to the TR.

7. If during execution of contractual plans and specifications the PM/CR determines the need to manage excess soils/debris/other media) not previously addressed in Form ECP-1, the PM/CR will consult with the TR to discuss management of affected media. Resolution and ultimate fate of the affected media will be documented by the TR on Form ECP-2 and filed according to procedures in Section 3.2.

8. Work shutdown will be at the discretion of the PM/CR's corporate health and safety policies and practices.

Note: Waste/excess soil, sludge or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed in the table in Section 3.1 and on the Spill/Incident Referral Sheet at the beginning of this document.

4.2.1.3 ***Utility Work***

Contractors performing utility work including all intrusive work (trenching, boring, digging, etc.) where surface features (soil, concrete, asphalt, vegetated surfaces) will be disturbed require conformance to the following procedures:

1. The utility project manager/contractor's representative (PM/CR) must contact the TR at least 14 days prior to initiation of intrusive utility work to discuss anticipated conditions and any special precautions to consider.

2. The PM/CR must arrange for all related utility clearance.

3. The PM/CR must meet with the TR to discuss task – specific precautions (as detailed in any and all applicable work activities described in this Section 4.2), complete and sign Form ECP-1 and provide to the TR for co-signature and filing.

4. A TR must be on-site or on call to respond to questions or observations that could require sampling or determinations relevant to management of impacted soil or debris. ***It is the responsibility of the PM/CR to notify the TR of construction schedules and activities (including any changes in schedules or scope of work effort) that may require on-site support and observation.***

5. Unless superseded by other special considerations (documented in ECP-1), utility construction activities may proceed per the contractual project/task plans and specifications.

6. Changing field considerations and observations (including encountering suspect soils/debris/odors or other media or modifications of proposed routes of utility corridors) must be immediately reported to the TR.

7. In general, soil/debris/spoils which will not be removed from the site can be used as backfill around utilities if determined by the PM/CR to be suitable fill material and the material has no appearance of contamination or odor. ***Soil/debris/spoils removed during the course of intrusive utility work with an appearance of contamination or odor will be immediately notified to the TR for consultation and resolution including temporary storage of the suspect material.***

8. If during execution of contractual plans and specifications the PM/CR determines there is a need to manage excess soils/debris/other media) not previously addressed in Form ECP-1, the PM/CR will consult with the TR to discuss management of affected media. Resolution and ultimate fate of the affected media will be documented by the TR on Form ECP-2 and filed according to procedures in Section 3.2.

9. Work shutdown will be at the discretion of the PM/CR's corporate health and safety policies and practices.

Note: Waste/excess soil, sludge or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed in the table in Section 3.1 and on the Spill/Incident Referral Sheet at the beginning of this document.

4.2.2 De-Watering Operations

De-watering operations within the WHRS will generally be associated with excavation or utility work described above. A project – specific Dewatering Permit has been provided by the NDEQ that governs any de-watering operations bounded by 2nd Street on the west, Salt Creek on the north and west, 8th Street on the east and "J" Street on the south. The permit and related conditions is included in Attachment 3. The City of Lincoln has been issued the permit and all

contractors intending to utilize the permit will co-sign as owner/operator and will be held to all terms and conditions of the permit.

Required sampling and reporting to NDEQ will be conducted by the TR and approval to discharge accumulated storage of dewatering fluids must be obtained from the TR prior to discharge. Initial dewatering discharge flows must be containerized for sampling and testing by the TR, whereupon results will be provided to the contractor along with permission to discharge under the above referenced permit. Alternative means of discharge (whether to the City of Lincoln's Sanitary Sewer System or off-site disposal), may be required if permit parameters are exceeded. Such alternative means will be in accordance with contractual requirements and shall be explicitly agreed upon by the CR and TR and documented on Form ECP-2.

Note: Waste/excess soil, sludge or debris may not be removed from properties covered under this document (whether for disposal or reuse) without review/concurrence of such actions by the Environmental Project Management Team Representatives listed in the table in Section 3.1 and on the Spill/Incident Referral Sheet at the beginning of this document.

4.2.3 Wetland Protection

4.2.3.1 Summary of Delineated Wetland Areas

Olsson and Associates (OA) and HWS Consulting Group (HWS) staff conducted a wetland delineation and assessment for the Haymarket Project area in 2007. According to the 2007 Wetland Delineation Report (Olsson/HWS September 2008), the Study Area encompassed 443 acres of land for the Project. Based on the methodology as described in the September 2008 Wetland Delineation Report, 22 separate and distinct wetland areas are located within the Study Area totaling 8.65 acres. In addition, two perennial streams are located within the Study Area and are considered jurisdictional waterways. A map of the defined areas is provided as Figure 5.

4.2.3.2 Avoidance and Minimization

State and federal regulations require that an applicant utilize a three-part process (mitigation sequencing) when evaluating potential impacts to wetlands and waterways. The mitigation sequence generally is as follows:

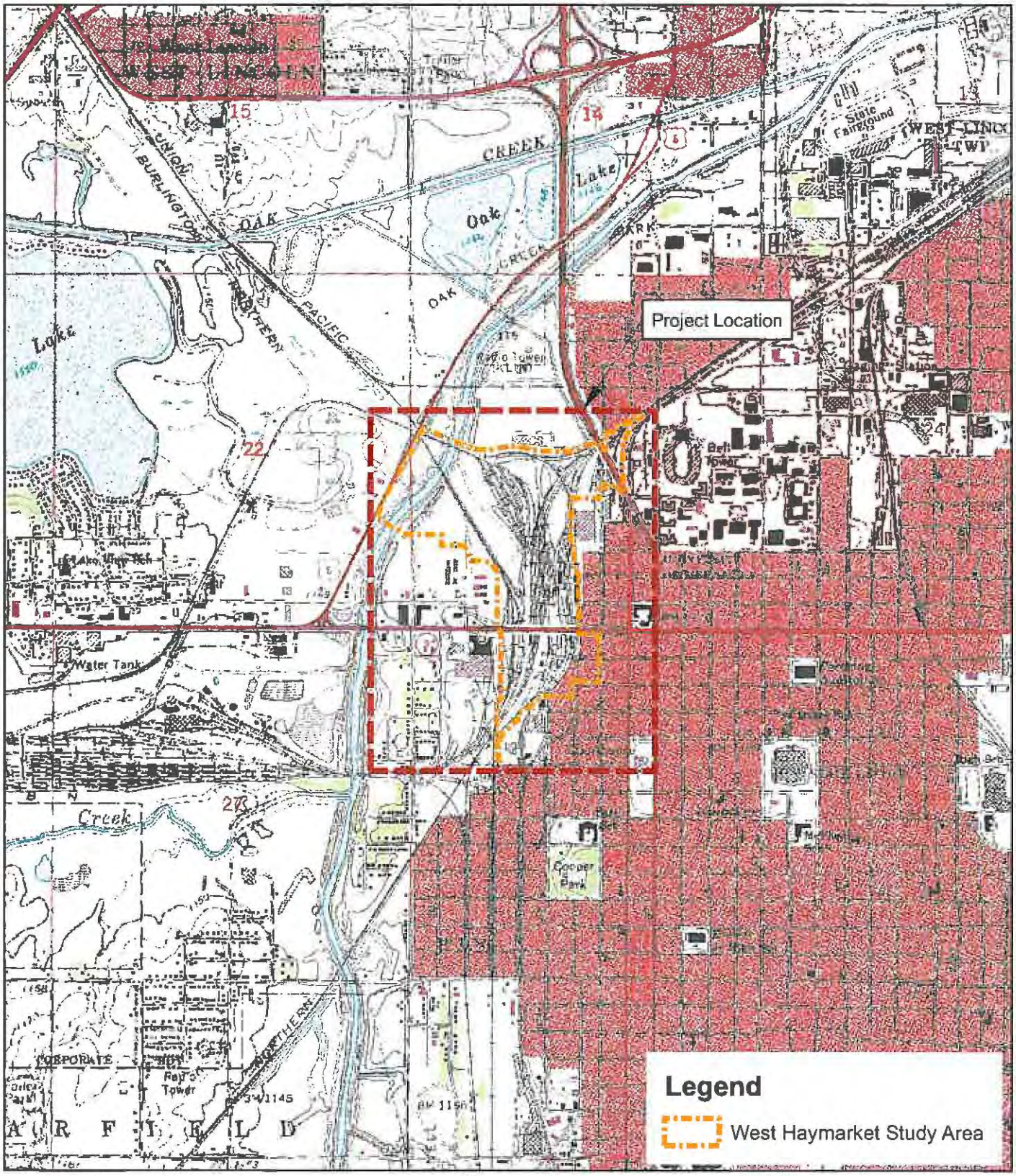
- *Avoid* adverse impacts to wetlands
- *Minimize* adverse impacts that cannot be avoided
- *Mitigate* for the remaining impacts that cannot be avoided or further minimized. Note: compensatory mitigation relates to permanent impacts and permanent loss of function, and can be used to offset significant short-term impacts that may be in effect for an extended period of time.

State and Federal Law generally requires that the applicant demonstrate that impacts[1] to jurisdictional wetlands and waters have been avoided and minimized to the greatest extent practicable. Potential construction practices near the boundaries of the delineated wetland areas should be considered when evaluating grading alternatives. For the purpose of the WHRS projects, wetland resources will be avoided to the extent practicable according to Section 404(b)(1) guidelines.

Tables 1 through 3 describe the typical disturbance activities, avoidance and minimization measures, respectfully for the wetland areas known to exist in the WHRS project area. These activities must be reviewed and determined by the PM/CR to what extent they must be employed and specified in EP-1 described above. Additional provisions relative to the 404 permit to be aware of and complied with will be attached to this ECP when the permit is obtained.

[1] 'Impacts' include fill, removal, mechanized land clearing (e.g., grubbing, bulldozing vegetation)

FIGURES



NRCS Quad Map

benesch
engineers · scientists · planners

N
W E
S

0 500 1,000 2,000
Feet

1 inch = 2,000 feet

Figure 1
Site Location Map

Environmental Contingency Plan
Lincoln, Nebraska

N 9TH ST
S ST
S S
R ST
N 8TH ST
H ST
O ST
N 2ND ST
ST
N 3RD ST
N 9TH ST
O ST
O ST
S 6TH ST
S 2ND ST
N ST
M ST
S 7TH ST
M ST
S 9TH ST
S 8TH ST
L ST
S 6TH ST
U.S. WAY

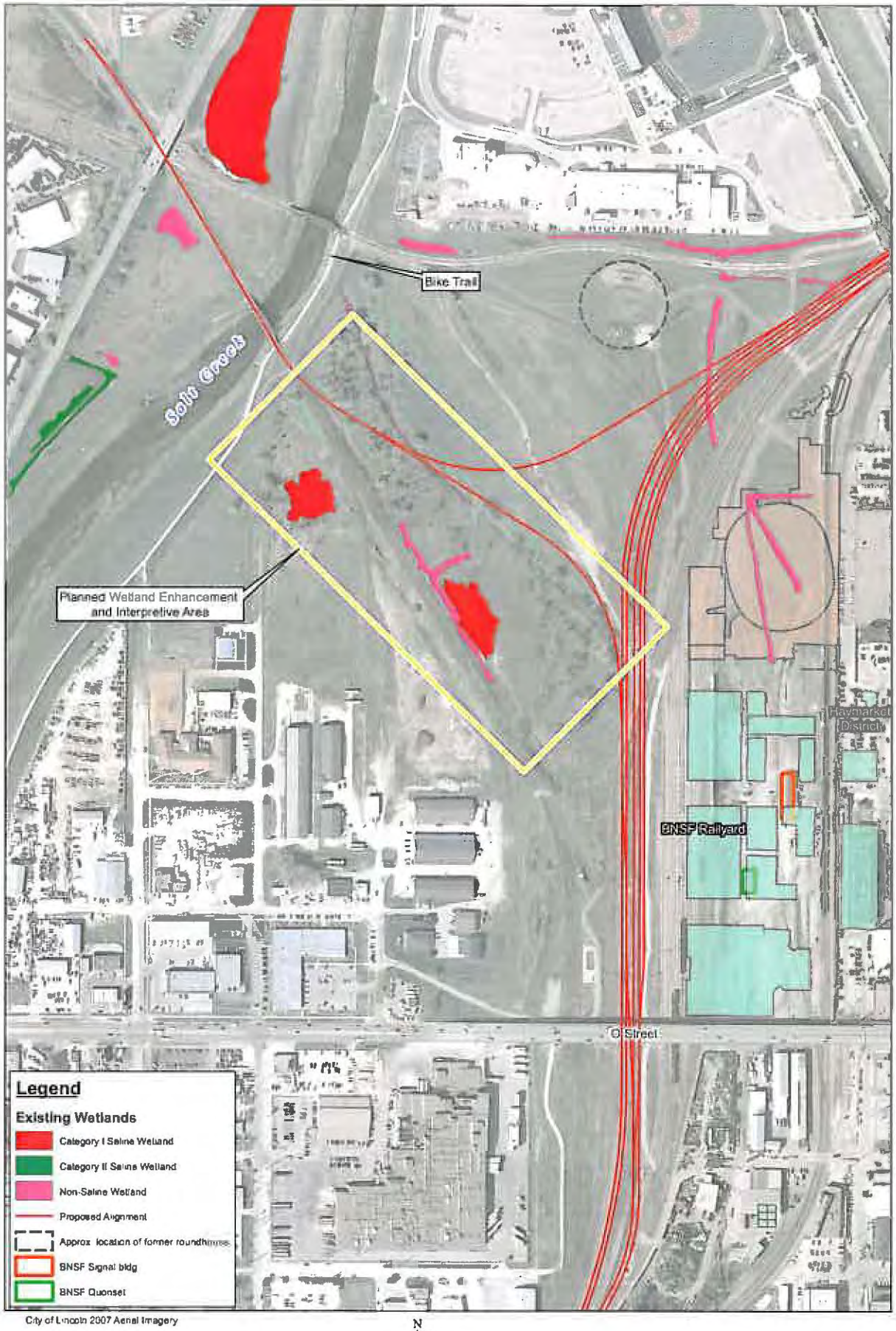
Figure 3a North Area Soil Impacts

Figure 3b South Area Soil Impacts

Figure 4a North Area Groundwater Impacts

Figure 4b South Area Groundwater Impacts

***Note that these figures are continually updated to reflect ongoing field investigations. A copy of the most current figures can be obtained from the Benesch Project Manager.**



City of Lincoln 2007 Aerial Imagery

N
W E
S

200 100 0 200 Feet

1 inch = 300 feet

benesch
engineers scientists planners

Figure 5
Wetlands Delineations

Environmental Contingency Plan
Lincoln, Nebraska

TABLES

Table 1 Potential Disturbance Activities		
Type of Activity	**Description**	**Typical Examples and Effects**
Fill	Fill is defined as any organic or inorganic material that is placed in a wetland or waterway[2].	• Temporary construction access roads • Stockpiling of construction material and or debris • Demolition • Construction pads for boring or other work • Trench side cast material • Work bridge or temporary detour structure piling • Highway improvements—shoulder widening, additional lanes, guardrail flares, etc.
Removal	Removal is defined as any organic or inorganic material that is removed from a wetland or waterway.	• Exploratory sampling or boring • Surface grading to create construction 'pad' or flat work area • Temporary trenching • Ditch cleaning where not exempt
Clearing / Grubbing	Clearing and grubbing involves the removal of vegetation and the top layer of soil to remove part of the roots.	• Sub-grade preparation • Abutment construction • Road bank re-contouring
Vegetation Clearing	To claim vegetation disturbance without soil disturbance the activity must involve cutting trees and shrubs off at their base, plucking them up, placing the debris in a truck and hauling it off.	• Creation of a roadway clear-zone
Hydrologic Changes	Changes that the project causes that affect the hydrology of the wetland or waterway	• Impeding or restricting the passage of normal or expected high flows • Stormwater treatment or drainage design that effectively alters wetland hydrology • Causing flooding or erosion downstream of the project • Draining an adjacent wetland by trenching/ditching/excavating

[2] According to the U.S. Army Corps of Engineers, piling is considered a structure and the placement of piling in a wetland or waterway does not require a permit under Section 404 of the Clean Water Act, which regulates the discharge of fill material. The placement of piling may be regulated under Section 10 of the Rivers and Harbors Act, which applies to tidally influenced and navigable waterways.

Table 2 Common Avoidance Measures	
Construction and Design Elements	**Considerations**
Reducing the Build Footprint	The use walls instead of fill slopes near wetlands and waterways should be considered if feasible and sustainable (i.e., will protect wetland functions with little maintenance). Walls are usually more costly than fill but the cost of mitigation should be weighed against the cost of fill.
Road Placement	Designing the placement of roadways to avoid wetlands and waterways is often not feasible; however slight shifts in alignment can often avoid and or minimize impacts to wetlands and waterways.
Temporary Roads and Access	Consider construction staging to avoid impacts where necessary and safety allows. Place staging areas, temporary access roads, or storage areas outside of wetlands and waterways. The wetlands and waterways will be demarcated on the plans sheets as well as in the field as no work zones to avoid incidental impacts. If temporary access to piers or girders on a bridge is needed, evaluate the feasibility of conducting the work using scaffolding hanging from the topside of the bridge or limiting equipment access to the bank above ordinary high watermark.
Stormwater Facilities	Avoid constructing storm water facilities in wetlands. Other locations or designs for stormwater facilities should be reviewed to determine that no other practicable alternative to locating them within a wetland exists.
Temporary Stockpiling of Materials	Avoid temporarily stockpiling construction material in wetlands. Suitable staging and stockpile areas are usually available. If absolutely necessary, follow minimization techniques for temporary fill described in Table 3.

Table 3 Minimization Measures	
Design and Construction Elements	**Minimization Measure(s)**
Temporary Fill for access roads, staging, other.	Can compact soil and also be difficult to remove after use (e.g., individual pieces of gravel sink into the soil substrate. Fill material removal can be made easier by using geotextile fabric in combination with either chain link fencing (placed below the geotextile fabric), or a geogrid (placed on top of geotextile fabric). Fill material is then placed on the top of these materials. When construction is complete fill is removed in lifts until a small amount remains to allow the sub material to be pulled up without ripping or breaking. The use of large 'balloon' tires on trucks and other equipment can help prevent soil compaction.
Construction Near Wetlands	If not properly demarcated construction impacts can "spread" into wetlands intended for avoidance. To minimize impacts clearly identify wetlands on plan sheets and demarcate on the ground using orange construction fencing and or silt fencing.
Construction Pads	Consider the use of crane mats, which are easily removed upon project completion with little mess (see photo).
Side cast material	Side cast material placed in wetlands should be replaced in the trench in the same order removed (i.e. topsoil segregation) to ensure the integrity of the soil is maintained and wetland impacts where the trench is located are minimized.
Sampling or Boring	Limit access to the wetland by sampling the edges instead of driving through the middle. If access is necessary it should be timed when the area is dry.
Temporary Trenching	Temporary impacts can become permanent if the trench is not adequately backfilled to prevent draining the adjacent wetland. Consider using clay plugs in the trench if the trench has the potential to "dewater" a wetland. Monitor area for changes.
Clearing / Grubbing and Vegetation Clearing	Limits of construction should be clearly shown on plans and identified on the ground. Wetlands should not be grubbed unless necessary or where they will be permanently impacted. If appropriate re-vegetate cleared and grubbed areas.
Hydrologic Changes	Implement erosion control measures and manage construction storm water to avoid sedimentation in wetlands. Place permeable fill material or install small culverts to maintain connectivity between wetlands. New stormwater facilities should use infiltration or avoid redirection from or to an existing wetland or waterway.

ATTACHMENT 1

PRELIMINARY CHEMICALS OF POTENTIAL CONCERN

ALTER
PCOPCs

2-Butanone (MEK)
Arochlor 1248
Arochlor 1260
Arsenic
Barium
Benzene
Cadmium
Chromium
Ethylbenzene
Lead
Mercury
Naphthalene
Silver
Toluene
Xylenes, total

BNSF
PCOPCs

1-Methylnaphthalene
2-Methylnaphthalene
4-Methyl-2-pentanone
Acenaphthene
Acenaphthylene
Acetone
Anthracene
Arsenic
Barium
Benzene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
bis(2-Ethylhexyl)phthalate
Cadmium
Carbazole
Carbon Disulfide
Chloroform
Chromium
Chrysene
cis-1,2-Dichloroethylene
Dibenzo(a,h)anthracene
Dibenzofuran
Diethyl Phthalate
Fluoranthene
Fluorene
Indeno(1,2,3-cd)pyrene
Isopropylbenzene
Lead
Mercury
Naphthalene
n-Butylbenzene
n-Propylbenzene
Phenanthrene
p-Isopropyltoluene
Pyrene
sec-Butylbenzene
Selenium
Silver
tert-Butylbenzene
TEH (Diesel)
TEH (Motor Oil)
Trichloroethylene
Vinyl Acetate

JAYLYNN
PCOPCs

1,1,2-Trichloroethane
2-Methylnaphthalene
4-Chloroaniline
Acenaphthene
Acenaphthylene
Acetone
Anthracene
Arsenic
Azobenzene
Barium
Benzene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Cadmium
Carbazole
Carbon disulfide
Chromium
Chrysene
Dibenzo(a,h)anthracene
Dibenzofuran
Di-n-butyl phthalate
Ethylbenzene
Fluoranthene
Fluorene
Hexane
Indeno(1,2,3-cd)pyrene
Lead
Mercury
Methyl ethyl ketone
Methyl Tert Butyl Ether
Methylene chloride
Naphthalene
Phenanthrene
Pyrene
Selenium
Styrene
Toluene
TEH (Diesel)
TEH (Motor Oil)
Xylenes, total

LINCOLN DEPOT
PCOPCs

1,3,5-Trimethylbenzene
1-Methylnaphthalene
2-Methylnaphthalene
Acenaphthene
Acetone
Arsenic
Barium
Benzene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Cadmium
Carbon disulfide
Chromium
Chrysene
Dibenzofuran
Ethylbenzene
Fluoranthene
Fluorene
Hexane
Indeno(1,2,3-cd)pyrene
Isopropylbenzene
Lead
Mercury
Methyl ethyl ketone
Naphthalene
n-Butylbenzene
n-Propylbenzene
o-Xylene
Phenanthrene
p-Isopropyltoluene
Pyrene
sec-Butylbenzene
Toluene
TEH (Diesel)
TEH (Motor Oil)

1,1,2-TRICHLOROETHANE

What is 1,1,2-trichloroethane?

1,1,2-Trichloroethane is a colorless, sweet-smelling liquid. It does not burn easily, can be dissolved in water, and evaporates easily. It is used as a solvent (a chemical that dissolves other substances) and as an intermediate in the production of the chemical, 1,1-dichloroethane. 1,1,2-Trichloroethane is sometimes present as an impurity in other chemicals, and it may be formed when another chemical breaks down in the environment under conditions where there is no air.

What happens to 1,1,2-trichloroethane when it enters the environment?

- Most 1,1,2-trichloroethane released into the environment will go into the air.
- 1,1,2-Trichloroethane breaks down slowly in air; it takes approximately 49 days for half of it to break down.
- 1,1,2-Trichloroethane may enter the groundwater by filtering through the soil.
- It appears to stay in water for a long time; it takes years for it to break down.

1,2-DICHLOROETHANE

What is 1,2-dichloroethane?

1,2-Dichloroethane, also called ethylene dichloride, is a manufactured chemical that is not found naturally in the environment. It is a clear liquid and has a pleasant smell and sweet taste. The most common use of 1,2-dichloroethane is in the production of vinyl chloride which is used to make a variety of plastic and vinyl products including polyvinyl chloride (PVC) pipes, furniture and automobile upholstery, wall coverings, house wares, and automobile parts. It is also used as a solvent and is added to leaded gasoline to remove lead.

What happens to 1,2-dichloroethane when it enters the environment?

- 'Most of the 1,2-dichloroethane released to the environment is released to the air. In the air, 1,2-dichloroethane breaks down by reacting with other compounds formed by sunlight. It can stay in the air for more than 5 months before it is broken down.
- 1,2-Dichloroethane can also be released into rivers and lakes. It breaks down very slowly in water and most of it will evaporate to the air.

1,2-DICHLOROETHENE

What is 1,2-dichloroethene?

1,2-Dichloroethene, also called 1,2-dichloroethylene, is a highly flammable, colorless liquid with a sharp, harsh odor. It is used to produce solvents and in chemical mixtures. You can smell very small amounts of 1,2-dichloroethene in air (about 17 parts of 1,2-dichloroethene per million parts of air [17 ppm]). There are two forms of 1,2-dichloroethene; one is called *cis*-1,2-dichloroethene and the other is called *trans*-1,2-dichloroethene. Sometimes both forms are present as a mixture.

What happens to 1,2-dichloroethene when it enters the environment?

- 1,2-Dichloroethene evaporates rapidly into air.
- In the air, it takes about 5-12 days for half of it to break down.
- Most 1,2-dichloroethene in the soil surface or bodies of water will evaporate into air.
- 1,2-Dichloroethene can travel through soil or dissolve in water in the soil. It is possible that it can contaminate groundwater.
- In groundwater, it takes about 13-48 weeks to break down.
- There is a slight chance that 1,2-dichloroethene will break down into vinyl chloride, a different chemical which is believed to be more toxic than 1,2-dichloroethene.

1,2-DICHLOROPROPANE

What is 1,2-dichloropropane?

1,2-Dichloropropane is a colorless, flammable liquid with a chloroform-like odor. It is moderately soluble in water and readily evaporates into air. It does not occur naturally in the environment. 1,2-Dichloropropane production in the United States has declined over the past 20 years. It was used in the past as a soil fumigant, chemical intermediate, and industrial solvent and was found in paint strippers, varnishes, and furniture finish removers. Most of these uses were discontinued. Today, almost all of the 1,2-dichloropropane is used as a chemical intermediate to make perchloroethylene and several other related chlorinated chemicals.

What happens to 1,2-dichloropropane when it enters the environment?

- 1,2-Dichloropropane released to air can spread to areas far from where it was released because it is not rapidly broken down by reactions with other chemicals and sunlight.
- Most of the 1,2-dichloropropane in water will evaporate to the air.
- When released to soil, it is not easily broken down by bacteria, but will easily evaporate to the air and filter into the groundwater.

- 1,2-Dichloropropane does not build up in the food chain.

SILVER

What is silver?

Silver is a naturally occurring element. It is found in the environment combined with other elements such as sulfide, chloride, and nitrate. Pure silver is "silver" colored, but silver nitrate and silver chloride are powdery white and silver sulfide and silver oxide are dark-gray to black. Silver is often found as a by-product during the retrieval of copper, lead, zinc, and gold ores. Silver is used to make jewelry, silverware, electronic equipment, and dental fillings. It is also used to make photographs, in brazing alloys and solders, to disinfect drinking water and water in swimming pools, and as an antibacterial agent. Silver has also been used in lozenges and chewing gum to help people stop smoking.

What happens to silver when is enters the environment?

- Silver may be released into the air and water through natural processes such as the weathering of rocks.
- Human activities such as the processing of ores, cement manufacture, and the burning of fossil fuel may release silver into the air.
- It may be released into water from photographic processing.
- Rain may wash silver out of soil into the groundwater.
- Silver does not appear to concentrate to a significant extent in aquatic animals.

ARSENIC

Arsenic is a metalloid

- Arsenic is ordinarily a steel gray metal-like material that occurs naturally.
- Arsenic compounds can be categorized as inorganic or organic.
- Inorganic arsenic is primarily used as a preservative for wood to make it resistant to rotting and decay. In 2003, the use of arsenic-containing wood preservatives was phased out for certain residential uses such as play structures, picnic tables, decks, fencing, and boardwalks. Arsenic wood preservatives are still used in industrial applications.
- Inorganic arsenic occurs naturally in soil and in many kinds of rock, especially in minerals and ores that contain copper or lead.

- Elemental arsenic is used as an alloying element in ammunition and solders, as an anti-friction additive to metals used for bearings, and to strengthen lead-acid storage battery grids.
- In the past, inorganic arsenic compounds were used as pesticides; this use is no longer permitted.
- MMA is used for weed control on cotton turf grass and lawns and under trees, vines, and shrubs. DMA, also referred to as cacodylic acid, is used for weed control under nonbearing citrus trees, around buildings and sidewalks, and for lawn renovation.

Arsenic in the Environment

- Arsenic cannot be destroyed in the environment. It can only change its form or become attached to or separated from particles.
- Arsenic attached to very small particles may stay in the air for many days and travel long distances.
- Arsenic in soil may be transported by wind or in runoff or may leach into the subsurface soil. Arsenic is largely immobile in agricultural soils, therefore, it tends to concentrate and remain in upper soil layers indefinitely.
- Transport and partitioning of arsenic in water depends upon the chemical form. Soluble forms move with the water and may be carried long distances. Arsenic may be adsorbed from water onto sediments or soils.

BARIUM

Barium is an alkaline earth metal

- Barium is a silvery-white metal that primarily occurs in nature as barite (barium sulfate) and witherite (barium carbonate) ores.
- Barium compounds are solids, existing as powder or crystals.

Barium in the Environment

- Barium enters the environment naturally through the weathering of rocks and minerals. Anthropogenic releases are primarily associated with industrial processes.
- In the atmosphere, barium is likely to present in particulate form and is primarily removed by wet and dry deposition.
- In aquatic media, barium is likely to precipitate out of solution as an insoluble salt.

- Barium is not very mobile in most soil systems due to the formation of water-insoluble salts and the inability of barium to form soluble complexes with fulvic and humic acids.
- Barium has the potential to bio-concentrate in marine animals and plants and in some terrestrial plants such as legumes, forage plants, Brazil nuts, and mushrooms.

BENZENE

Benzene is a colorless liquid

- Benzene, also known as benzol, has a sweet odor.
- Benzene is highly flammable.
- Benzene is made mostly from petroleum sources. Various industries use benzene to make other chemicals, such as styrene (for Styrofoam® and other plastics), cumene (for various resins), and cyclohexane (for nylon and synthetic fibers).
- Benzene is also used for the manufacturing of some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides.
- Benzene is also a natural component of crude oil, gasoline and cigarette smoke.

Benzene in the Environment

- Benzene enters the air, water, and soil as a result of industrial processes, emissions from burning coal and oil, tobacco smoke, gasoline exhaust and gasoline leaks, and from natural sources including volcanoes and forest fires.
- Benzene in the atmosphere chemically degrades in only a few days.
- Benzene released to soil or waterways is subject to volatilization, photooxidation, and biodegradation.

CARBON DISULFIDE

What is carbon disulfide?

Pure carbon disulfide is a colorless liquid with a pleasant odor that is like the smell of chloroform. The impure carbon disulfide that is usually used in most industrial processes is a yellowish liquid with an unpleasant odor, like that of rotting radishes. Carbon disulfide evaporates at room temperature, and the vapor is more than twice as heavy as air. It easily explodes in air and also catches fire very easily. In nature, small amounts of carbon disulfide are found in gases released to the earth's surface as, for example, in volcanic eruptions or over marshes. Commercial carbon disulfide is made by combining carbon and sulfur at very high temperatures.

What happens to carbon disulfide when it enters the environment?

- The amount of carbon disulfide released into the air through natural processes is difficult to judge because it is so small.
- Carbon disulfide evaporates rapidly when released to the environment.
- Most carbon disulfide in the air and surface water is from manufacturing and processing activities.
- It is found naturally in coastal and ocean waters.
- Carbon disulfide does not stay dissolved in water very long, and it also moves through soils fairly quickly.
- Carbon disulfide does not appear to be taken up in significant amounts by the organisms living in water.

CADMIUM

What is cadmium?

Cadmium is a natural element in the earth's crust. It is usually found as a mineral combined with other elements such as oxygen (cadmium oxide), chlorine (cadmium chloride), or sulfur (cadmium sulfate, cadmium sulfide). All soils and rocks, including coal and mineral fertilizers, contain some cadmium. Most cadmium used in the United States is extracted during the production of other metals like zinc, lead, and copper. Cadmium does not corrode easily and has many uses, including batteries, pigments, metal coatings, and plastics.

What happens to cadmium when it enters the environment?

- Cadmium enters soil, water, and air from mining, industry, and burning coal and household wastes.
- Cadmium does not break down in the environment, but can change forms.
- Cadmium particles in air can travel long distances before falling to the ground or water.
- Some forms of cadmium dissolve in water.
- Cadmium binds strongly to soil particles.
- Fish, plants, and animals take up cadmium from the environment.

CHROMIUM

What is chromium?

Chromium is a naturally occurring element found in rocks, animals, plants, and soil. It can exist in several different forms. Depending on the form it takes, it can be a liquid, solid, or gas. The

most common forms are chromium(0), chromium(III), and chromium(VI). No taste or odor is associated with chromium compounds. The metal chromium, which is the chromium(0) form, is used for making steel. Chromium(VI) and chromium(III) are used for chrome plating, dyes and pigments, leather tanning, and wood preserving.

What happens to chromium when it enters the environment?

- Chromium can be found in air, soil, and water after release from the manufacture, use, and disposal of chromium-based products, and during the manufacturing process.
- Chromium does not usually remain in the atmosphere, but is deposited into the soil and water.
- Chromium can easily change from one form to another in water and soil, depending on the conditions present.
- Fish do not accumulate much chromium in their bodies from water.

DI-*n*-BUTYL PHTHALATE

What is di-*n*-butylphthalate?

Di-*n*-butyl phthalate is a manufactured chemical that does not occur naturally. It is an odorless and oily liquid that is colorless to faint yellow in color. It is slightly soluble in water and does not evaporate easily. Di-*n*-butyl phthalate is used to make plastics more flexible and is also in carpet backings, paints, glue, insect repellents, hair spray, nail polish, and rocket fuel.

What happens to di-*n*-butylphthalate when it enters the environment?

- Di-*n*-butyl phthalate is released to air as a vapor. It can react with other chemicals in the air and is usually broken down within a few days. Di-*n*-butyl phthalate can also attach to particles in the air and eventually settle to the land and water.
- Most of the di-*n*-butyl phthalate in water attaches to sediment and settles out of the water or is broken down by bacteria. Small amounts may evaporate to the air.
- When released to the soil, it attaches to soil particles and is broken down by bacteria.
- There is no evidence that it builds up in the food chain.

DIETHYL PHTHALATE

What is diethyl phthalate?

Diethyl phthalate is a colorless liquid that has a bitter, disagreeable taste. This synthetic substance is commonly used to make plastics more flexible. Products in which it is found include toothbrushes, automobile parts, tools, toys, and food packaging. Diethyl phthalate can

be released fairly easily from these products, as it is not part of the chain of chemicals (polymers) that makes up the plastic. Diethyl phthalate is also used in cosmetics, insecticides, and aspirin.

What happens to diethyl phthalate when it enters the environment?

- Diethyl phthalate has been found in waste sites and landfills from discarded plastics.
- It may break down in the air.
- It can become attached to particles of dust in the air, and can settle out.
- It is broken down to harmless products by microorganisms in soil and water.
- Small amounts of it can build up in fish and shellfish living in water containing it.

ETHYLBENZENE

Ethylbenzene is a liquid

- Ethylbenzene is a colorless liquid with an aromatic odor.
- Ethylbenzene is flammable and combustible.
- It is naturally found in crude petroleum.
- It is a high production volume chemical primarily used for the production of styrene.

Ethylbenzene in the Environment

- Ethylbenzene partitions primarily to air and removal via photochemically generated hydroxyl radicals is an important degradation mechanism.
- The half-life in air is approximately 1-2 days.
- In surface water, most of the ethylbenzene will evaporate. The remaining ethylbenzene is broken down through photooxidation and biodegradation.
- Ethylbenzene is moderately mobile in soil.
- Ethylbenzene does not appear to bioconcentrate in aquatic food chains

MERCURY

What is mercury?

Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas. Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts," which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common one, methylmercury, is produced mainly by

microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make. Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, dental fillings, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.

What happens to mercury when it enters the environment?

- Inorganic mercury (metallic mercury and inorganic mercury compounds) enters the air from mining ore deposits, burning coal and waste, and from manufacturing plants.
- It enters the water or soil from natural deposits, disposal of wastes, and volcanic activity.
- Methylmercury may be formed in water and soil by small organisms called bacteria.
- Methylmercury builds up in the tissues of fish. Larger and older fish tend to have the highest levels of mercury.

METHYL *TERT*-BUTYL ETHER

What is methyl *tert*-butyl ether?

Methyl *tert*-butyl ether (MTBE) is a flammable liquid with a distinctive, disagreeable odor. It is made from blending chemicals such as isobutylene and methanol, and has been used since the 1980s as an additive for unleaded gasoline to achieve more efficient burning. MTBE is also used to dissolve gallstones. Patients treated in this way have MTBE delivered directly to their gall bladders through special tubes that are surgically inserted.

What happens to MTBE when it enters the environment?

- MTBE quickly evaporates from open containers and surface water, so it is commonly found as a vapor in the air.
- Small amounts of MTBE may dissolve in water and get into groundwater.
- It remains in underground water for a long time.
- MTBE may stick to particles in water, which will cause it to eventually settle to the bottom sediment.
- MTBE may be broken down quickly in the air by sunlight.
- MTBE does not build up significantly in plants and animals.

POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)

What are polycyclic aromatic hydrocarbons?

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot. Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks
- PAHs enter water through discharges from industrial and wastewater treatment plants.
- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

LEAD

Lead is a metal

- Lead is a naturally-occurring bluish-gray metal that is rarely found in its elemental form, but occurs in the Earth's crust primarily as the mineral galena (PbS), and to a lesser extent as anglesite ($PbSO_4$) and cerussite ($PbCO_3$).
- Lead is not a particularly abundant element, but its ore deposits are readily accessible and widely distributed throughout the world. Its properties, such as corrosion resistance,

density, and low melting point, make it a familiar metal in pipes, solder, weights, and storage batteries.

- Natural lead is a mixture of four stable isotopes, ^{208}Pb (51–53%), ^{206}Pb (23.5– 27%), ^{207}Pb (20.5–23%), and ^{204}Pb (1.35–1.5%). Lead isotopes are the stable decay product of three naturally radioactive elements: ^{205}Pb from uranium, ^{207}Pb from actinium, and ^{208}Pb from thorium.

Lead in the Environment

- Lead is dispersed throughout the environment primarily as the result of anthropogenic activities. In the air, lead is in the form of particles and is removed by rain or gravitational settling.
- The fate of lead in soil is affected by the adsorption at mineral interfaces, which are dependent upon physical and chemical characteristics of the soil (e.g., pH, soil type, particle size, organic matter content).
- Sources of lead in dust and soil can include lead from weathering and chipping of lead-based paint from buildings, bridges, and other structures.
- The solubility of lead compounds in water is a function of pH, hardness, salinity, and the presence of humic material. Solubility is highest in soft, acidic water.

PHENOL

What is phenol?

Phenol is both a manufactured chemical and a natural substance. It is a colorless-to-white solid when pure. The commercial product is a liquid. Phenol has a distinct odor that is sickeningly sweet and tarry. You can taste and smell phenol at levels lower than those that are associated with harmful effects. Phenol evaporates more slowly than water, and a moderate amount can form a solution with water. Phenol is used primarily in the production of phenolic resins and in the manufacture of nylon and other synthetic fibers. It is also used in slimicides (chemicals that kill bacteria and fungi in slimes), as a disinfectant and antiseptic, and in medicinal preparations such as mouthwash and sore throat lozenges.

What happens to phenol when it enters the environment?

- Following small, single releases, phenol is rapidly removed from the air (generally, half is removed in less than a day).
- Phenol generally remains in the soil only about 2 to 5 days.

- Phenol can remain in water for a week or more.
- Larger or repeated releases of phenol can remain in the air, water, and soil for much longer periods of time.
- Phenol does not build up in fish, other animals, or plants

SELENIUM

What is selenium?

Selenium is a naturally occurring mineral element that is distributed widely in nature in most rocks and soils. In its pure form, it exists as metallic gray to black hexagonal crystals, but in nature it is usually combined with sulfide or with silver, copper, lead, and nickel minerals. Most processed selenium is used in the electronics industry, but it is also used: as a nutritional supplement; in the glass industry; as a component of pigments in plastics, paints, enamels, inks, and rubber; in the preparation of pharmaceuticals; as a nutritional feed additive for poultry and livestock; in pesticide formulations; in rubber production; as an ingredient in antidandruff shampoos; and as a constituent of fungicides. Radioactive selenium is used in diagnostic medicine.

What happens to selenium when it enters the environment?

- Selenium occurs naturally in the environment and can be released by both natural and manufacturing processes.
- Selenium dust can enter the air from burning coal and oil. This selenium dust will eventually settle over the land and water.
- It also enters water from natural deposits in rocks and soil, and from agricultural and industrial waste. Some selenium compounds will dissolve in water, and some will settle to the bottom as particles.
- Insoluble forms of selenium will remain in soil, but soluble forms are very mobile and may enter surface water from soils.
- Selenium may accumulate up the food chain.

STYRENE

What is styrene?

Styrene is a colorless liquid that evaporates easily and has a sweet smell. It often contains other chemicals that give it a sharp, unpleasant smell. Styrene is widely used to make plastics and rubber. Products containing styrene include insulation, fiberglass, plastic pipes, automobile parts, shoes, drinking cups and other food containers, and carpet backing. Most of these

products contain styrene linked together in a long chain (polystyrene) as well as unlinked styrene. Low levels of styrene also occur naturally in a variety of foods such as fruits, vegetables, nuts, beverages, and meats. In addition, small amounts of styrene can be transferred to food from styrene-based packaging material.

What happens to styrene when it enters the environment?

- Styrene can be found in air, water, and soil after release from the manufacture, use, and disposal of styrene-based products.
- It is quickly broken down in the air, usually within 1 to 2 days.
- Styrene evaporates from shallow soils and surface water. Styrene that remains in soil or water may be broken down by bacteria or other microorganisms.
- Styrene is not expected to build up in animals.

XYLENES

Xylene is a colorless liquid

- Xylene is a colorless, flammable liquid with a somewhat sweet odor.
- Xylene evaporates and burns easily.
- Xylenes (mixtures of ortho-, meta-, and para-isomers) are used as industrial solvents, synthetic intermediates, and solvents in commercial products such as paints, coatings, adhesive removers, and paint thinners; they are also a component of gasoline.
- Xylene occurs naturally in petroleum and coal tar and is formed during forest fires.

Xylene in the Environment

- Xylene released to the atmosphere is quickly transformed by photooxidation with a half-life of approximately 8–14 hours.
- When released to soil or surface water, xylene volatilizes into the atmosphere, where it is quickly degraded.
- Xylene that does not volatilize quickly may undergo biodegradation in the soil or water.
- Xylene may also leach into groundwater, where degradation by microbes becomes the primary removal process.

ATTACHMENT 2

WEST HAYMARKET REDEVELOPMENT SITE **FORM ECP-1**

ENVIRONMENTAL CONTINGENCY PLAN

WORK ACTIVITY:

PROJECT MANAGER/CONTRACTOR'S REPRESENTATIVE:

DATES OF CONSTRUCTION:

ATTACHMENTS (LIST):

SPECIAL PRECAUTIONS:

CERTIFICATION

By signing this certification, I acknowledge on behalf of _____ (organization) that I have received a copy of the WHRS ECP, understand the obligations and procedures relevant to my organization's planned work activity and agree to abide by any and all special precautions described above. Deviations to planned work activities and special precautions will be coordinated with the City of Lincoln's Environmental Project Management Team's Technical Representative (TR).

Organizational Representative

(Print Name and Title): _____

Signature/Date: _____

EPMT TR: _____

Signature/Date: _____

WEST HAYMARKET REDEVELOPMENT SITE **FORM ECP-2**

ENVIRONMENTAL CONTINGENCY PLAN

WORK ACTIVITY:

PROJECT MANAGER/CONTRACTOR'S REPRESENTATIVE:

DATE OF ECP-1 AND ANY SUPPLEMENTS:

ATTACHMENTS (LIST) INCLUDING ANY PHOTO LOG:

OBSERVATION(S):

CORRECTIVE ACTION(S):

EPMT TR: _____

Signature/Date: _____

ATTACHMENT 3

Soil Management Guidance

On-Site Utilities, Grading Work, and Geotechnical Boring Soil:

- Generation of spoils is not considered active management, can be replaced in the excavation/hole
- Excess spoils should be containerized, or if stockpiled, an Area of Contamination (AOC) designation should be requested (use of plastic sheeting not acceptable)
- Soil must be sampled either "as generated" with reasonable sampling frequency **OR** pre-characterized with densely-spaced horizontal and vertical in-situ sampling
- Soil must be tested before taken off-site using either the TCLP method **OR** a totals analysis with moisture content (100% dry solids if 20 to 1 rule used)
    - Visual/olfactory evidence alone cannot be used
- Soil to be used as fill must be tested and contain contaminants at levels less than those listed on the Voluntary Cleanup Program Lookup Tables, or otherwise demonstrate that use of fill would be protective of human health and the environment

On-Site Unsuitable Geotechnical Material Soil:

- Excess spoils should be containerized, or if stockpiled, an Area of Contamination (AOC) designation should be requested (use of plastic sheeting not acceptable)
- Soil must be sampled either "as generated" with reasonable sampling frequency **OR** pre-characterized with densely-spaced horizontal and vertical in-situ sampling
- Soil must be tested before taken off-site using either the TCLP method **OR** a totals analysis with moisture content (100% dry solids if 20 to 1 rule used)
    - Visual/olfactory evidence alone cannot be used
- Soil to be used as fill must be tested and contain contaminants at levels less than those listed on the Voluntary Cleanup Program Lookup Tables, or otherwise demonstrate that use of fill would be protective of human health and the environment

On-Site Investigation Derived Waste and Remediation Waste Soil:

- Must be containerized and tested
- Soil must be sampled either "as generated" with reasonable sampling frequency **OR** pre-characterized with densely-spaced horizontal and vertical in-situ sampling **OR** based on collected environmental sample from groundwater or soil (soil sample must be representative of entire soil boring column)
- Soil must be tested before taken off-site using either the TCLP method **OR** a totals analysis with moisture content (100% dry solids if 20 to 1 rule used)
    - Visual/olfactory evidence alone cannot be used
- Soil to be used as fill must be tested and contain contaminants at levels less than those listed on the Voluntary Cleanup Program Lookup Tables, or otherwise demonstrate that use of fill would be protective of human health and the environment

Off-Site Utilities and Road Construction Soil:

- Generation of spoils is not considered active management, can be replaced in the excavation/hole
- Stockpiling of excess spoils and use of visual/olfactory evidence for soil characterization is acceptable **unless** there is knowledge of contamination in the area, then sampling must be done as described above for on-site utilities work
    - This knowledge may be acquired by conducting a records search of the Nebraska Department of Environmental Quality files
- If contamination is encountered during construction, the contaminated soil must be managed as described above for on-site utilities work
- Soil to be used as fill must be tested and contain contaminants at levels less than those listed on the Voluntary Cleanup Program Lookup Tables, or otherwise demonstrate that use of fill would be protective of human health and the environment

SPECIAL WASTE DISPOSAL PERMIT

Tuesday, November 09, 2010

Lincoln-Lancaster County Health Department
Special Waste Program
3140 N Street
Lincoln, Nebraska 68510
(402) 441-8021

18355-001-8C

JOINT PUBLIC AGENCY-HAYMARKET ARENA
555 S 10TH ST
ROOM 111
LINCOLN, NE 68508

Generator:
JOINT PUBLIC AGENCY-HAYMARKET ARENA

Facility:
JOINT PUBLIC AGENCY-HAYMARKET ARENA
555 S 10TH ST
ROOM 111
LINCOLN, NE 68508

Contact Information:
MIKI ESPOSITO
PW LIAISON & COMPLIANCE

DATE ISSUED: 11/09/2010 **DATE EXPIRES:** 08/01/2012

The following permits are granted for the disposal of Special Wastes at the sites shown below. These permits were issued based on the waste description information provided on the permit application . Any substantial change in the nature of the waste from that described in the permit application, will invalidate the permit. Failure to comply with the General Permit Conditions or special conditions described on this permit will invalidate the permit.

PERMIT NUMBER: 10-18355-001-10-09 **HAULER:** NO DESIGNATED HAULER

WASTE TYPE: 10 PETROLEUM CONTAMINATED REFUSE (A. FILTERS, B. SHOP RAGS, C. SOIL, D. ABSORBENTS, OR E. OTHER MATERIAL)

WASTE DESCRIPTION: SOIL FROM EAST-CENTRAL (FUEL DEPOT) & WEST GRADING AREA

DISPOSAL SITE: BLUFF ROAD LANDFILL ONLY

SPECIAL CONDITIONS: *** PETROLEUM-CONTAMINATED SOIL GENERATED AT THE FUEL RELEASE SITE NEAR THE EAST-CENTRAL AREA NEAR THE FORMER FUELING STATION. SOIL MAY ALSO BE GENERATED FROM OTHER AREAS (DETAILED MAP ON FILE AT LLCHD).

THIS PERMIT EXCLUDES CONTAMINATED SOILS THAT MAY BE ENCOUNTERED AT THE FORMER ROUNDHOUSE AND THE FORMER UPRR TURNTABLE. ***

*** PLEASE NOTE THE FOLLOWING INFORMATION CONCERNING YOUR PERMIT ***

WASTE DISPOSED UNDER THIS PERMIT IS TO BE DIRECTED TO BLUFF ROAD LANDFILL ONLY!

PERMIT VALID FOR THE WASTE TYPE AND SOURCE LOCATION DESCRIBED ABOVE ONLY. PERMIT DOES NOT AUTHORIZE DISPOSAL OF HAZARDOUS WASTE. GENERATOR IS RESPONSIBLE FOR DETERMINING IF WASTE IS HAZARDOUS. ALL LOADS SUBJECT TO INSPECTION.

WASTE IN THIS CATEGORY MAY NOT CONTAIN "FREE PETROLEUM PRODUCT" OR OTHER LIQUIDS.

PLEASE CONTACT TINA BAKER AT THE LANDFILL AT 441-8102 BEFORE INITIATING THE FIRST LOADS OF WASTE TO DISCUSS QUANTITIES AND TIME SCHEDULES OF DELIVERY.

A COPY OF THIS PERMIT MUST ACCOMPANY ALL LOADS.

ALL LOADS TRAVERSING LANCASTER COUNTY ROADS AND/OR ENTERING THE LANDFILL MUST BE COVERED/TARPED.

STATE OF NEBRASKA

Dave Heineman
Governor

DEPARTMENT OF ENVIRONMENTAL QUALITY
Michael J. Linder
Director
Suite 400, The Atrium
1200 'N' Street
P.O. Box 98922
Lincoln, Nebraska 68509-8922
Phone (402) 471-2186
FAX (402) 471-2909
website. www.deq.state.ne.us

FEB 18 2011

Mr. Chad Blahak
City of Lincoln
Public Works/ Engineering Services
555 South 10th Street
Lincoln, NE 68508

RE: Dewatering Authorization Restrictions Under General National Pollutant Discharge Elimination System (NPDES) NEG671000 for Lincoln Haymarket/Arena Construction
(Area bounded by 2nd Street, Salt Creek Street, 8th Street, and J Street, Lincoln, NE)

Dear Mr. Blahak,

This letter provides requirements for continued authorization under the Department of Environmental Quality's General NPDES Permit for Construction Dewatering (NEG671000). Due to the known pollutants present in groundwater and soils in this area, additional restrictions will be required in order to protect surface water.

The general permit cannot authorize discharge that in accordance with Part I. C of the permit may create potential water quality impacts on the receiving stream. In addition, in accordance with Part IV.B, the permit prohibits toxic discharges. Known toxics have been determined to be present on this site, and therefore, unless there is further analysis of the dewatering water, it cannot be authorized by this permit to discharge. In order to determine whether or not an authorized discharge can take place, the water must be analyzed prior to discharge. Therefore, to continue authorization under NPDES General Permit NEG67100, all work requiring dewatering discharges must:

1. Containerize the dewatering water.
2. Test each container for the constituents found in Table 1, 2, and 3.
3. Test results must be completed and compared to maximum discharge levels found in Table 1, 2, and 3.
4. If all test results are **below** maximum discharge levels found in Table 1, 2, and 3 discharge authorization is continued under the NPDES General Permit NEG671000. All other terms and conditions of the permit continue to apply.
5. If any test result is **above** maximum discharge levels found in Table 1, 2, and 3, the discharge is no longer authorized under the NPDES General Permit NEG671000 and is prohibited from direct discharge. Alternate disposition and /or treatment are required.
    a. Approval from a municipal wastewater treatment facility (WWTF) is required prior to discharging to the WWTF. Please be advised that some of the pollutants found on this site may adversely affect the quality of biosolids from the WWTF.
    b. Any type of treatment on site will require a site-specific NPDES permit applicable to the type of treatment and the pollutants treated. A site specific application for this permit will be required. (Form 1 and 2C)
    c. Treatment can be performed by an off-site facility that is designed, permitted, and approved to treat the pollutants present.

6. Test results shall be recorded on the attached Discharge Monitoring Reports (DMR) and submitted to the Department on a quarterly basis. Reports can be sent to the address at the end of the DMR form.

Table 1: Requirements for Dieldrin, PCBs, and TPH

Parameters	Storet #	Units	Maximum Discharge Levels	Frequency	Sample Type
Dieldrin	39380	µg/L	0.00144	Once/batch	Grab
Polychlorinated Biphenyls	39516	µg/L	0.0017	Once/batch	Grab
Total Petroleum Hydrocarbons	82180	mg/L	10	Once/batch	Grab

Table 2: Requirements for Metals

Parameters	Storet #	Units	Maximum Discharge Levels	Monitoring Frequency	Sample Type
Arsenic, Total Recoverable	00978	µg/L	16.7	Once/batch	Grab
Cadmium, Total Recoverable	01113	µg/L	0.527	Once/batch	Grab
Chromium (III), Total Recoverable	04262	µg/L	189.5	Once/batch	Grab
Chromium (VI), Total Recoverable	78247	µg/L	11.0	Once/batch	Grab
Lead, Total Recoverable	01114	µg/L	8.1	Once/batch	Grab
Mercury, Total Recoverable	71901	µg/L	0.77	Once/batch	Grab
Selenium, Total Recoverable	00981	µg/L	5.0	Once/batch	Grab

Table 3: Requirements for Polycyclic Aromatic Hydrocarbons					
Parameters	Storet #	Units	Maximum Discharge Levels	Monitoring Frequency	Sample Type
Benzo(a)antracene	34526	µg/L	0.49	Once/batch	Grab
Benzo(a)pyrene	34247	µg/L	0.49	Once/batch	Grab
Benzo(b)fluoranthene	34230	µg/L	0.49	Once/batch	Grab
Benzo(k)fluoranthene	34242	µg/L	0.49	Once/batch	Grab
Chrysene	34320	µg/L	0.49	Once/batch	Grab
Dibenzo(a,h)anthracene	34556	µg/L	0.49	Once/batch	Grab
Indeno(1,2,3-cd)pyrene	34403	µg/L	0.49	Once/batch	Grab
Naphthalene	34696	µg/L	620	Once/batch	Grab

These additional restrictions must be satisfied to qualify for authorization under the NPDES General Dewatering Permit NEG 671000 for construction dewatering activity in the area bounded by 2nd Street, Salt Creek Street, 8th Street and J Street, Lincoln, NE and are effective immediately. Please contact me if you have questions.

Sincerely,

Donna K. Garden

Donna K. Garden, Supervisor
NPDES Permits and Compliance Unit
Wastewater Section
402-471-1367
donna.garden@nebraska.gov

cc: T. J. Osborn Construction, 5801 Johanna Road, Lincoln, Nebraska 68507 (402-464-4235)
Frank Uhlarik , Alfred Benesch and Co., 825 J Street, PO Box 80358, Lincoln, Nebraska 68501
Miki Esposito, City of Lincoln, 555 South 10th Street, Lincoln, NE 68508

Nebraska Department of Environmental Quality

Wastewater Section
1200 'N' Street, Suite 400, The Atrium
PO Box 98922
Lincoln, NE 68509-8922
Tel. 402/471-4220
(a) Fax 402/471-2909

DW-DMR

Dewater Discharges Discharge Monitoring Report (DMR) Authorized Under NPDES General Permit NEG671000

This DW-DMR is to be submitted monthly (i.e., within 28 days after the end of each calendar month), unless alternative submittal arrangements are approved. Any pH, Oil & Grease, or Total Suspended Solids monitoring results that are not in compliance with the permit effluent limits shall be reported to the Department within 24 hours (Telephone 402/471-4220) and a written non-compliance report must be submitted within 7 days (See Appendix A, Sections D.2 and D.3 in the permit). If the appropriate information is included on this form, it may be used as a non-compliance report form and to provide notification of project completion. Be sure to fill in all of the appropriate blanks below and sign on the back of this form.

NPDES Tracking Number: NEG671 ___ ___ ___ - R

Project Owner or Operator: _____

Project Name & Location: _____

When is the discharge anticipated to begin? (mo/day/yr) _____

What is the Outfall Designations: _____

What is the Source of the outfall? (i.e. well, pit, foundation pump, etc.) _____

_____

Discharge Monitoring Report_____ Date_____

Site_____

Parameter	Discharge Limit	Unit	Monitoring Result	Unit	Sample Type
Volume Discharged	Report	Gallons			
Dieldrin	0.00144	µg/L			
Polychlorinated Biphenyls	0.0017	µg/L			
Total Petroleum Hydrocarbons	10.0	mg/L			

Parameter	Discharge Limit	Unit	Monitoring Result	Unit	Sample Type
Arsenic, Total Recoverable	16.7	µg/L			
Cadmium, Total Recoverable	0.527	µg/L			
Chromium (III), Total Recoverable	189.0	µg/L			
Chromium (VI), Total Recoverable	11.0	µg/L			
Lead, Total Recoverable	8.1	µg/L			
Mercury, Total Recoverable	0.77	µg/L			
Selenium, Total Recoverable	5.0	µg/L			

Parameter	Discharge Limit	Unit	Monitoring Result	Unit	Sample Type
Benzo(a)anthracene	0.49	µg/L			
Benzo(a)pyrene	0.49	µg/L			
Benzo(f)fluoranthene	0.49	µg/L			
Benzo(k)fluoranthene	0.49	µg/L			
Chrysene	0.49	µg/L			
Dibenzo(a,h)anthracene	0.49	µg/L			
Indeno(1,2,3-cd)pyrene	0.49	µg/L			
Naphthalene	620	µg/L			

Certification

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

Owner or Operator Signature or Authorized Representative**	**Date Signed**
Print Name	**Title**

For Information on the submittal of the DW-DMR see page 4.

The qualifications and responsibilities of the authorized representative are described on page 4.

Requirements for and Responsibilities of Owner/Operator and Authorized Representative

The "**owner or operator**" is responsible for signing all permit applications and must meet the requirements set forth in NDEQ Title 119 Chapter, 13 002:

"All permit applications submitted to the Department shall be signed:

002.01 – For a corporation, by a responsible corporate officer;

002.02 - For a partnership or a sole proprietorship by a general partner or the proprietor; and

002.03 - For a municipal, State, Federal, or other public facility by either a principal executive officer or ranking elected official."

The "**authorized representative**" is the primary facility contact for correspondence and monitor reporting, and must meet the requirements set forth in NDEQ Title 119, Chapter 13 003:

"All other correspondence, reports and DMR's shall be signed by a person designated in 001.01 through 001.04 above or a duly authorized representative if such representative is responsible for the overall operation of the facility from which the discharge originates; the authorization is made in writing by the person designated under 001.01 through 001.03 above; and the written authorization is submitted to the Director."

Submit the completed DW-DMR form to one of the following addresses:

US Postal Service Address	**Alternate Carrier Address**
Wastewater Section Nebraska Department of Environmental Quality PO Box 98922 Lincoln, NE 68509-8922	Wastewater Section Nebraska Department of Environmental Quality The Atrium, 1200 N Street, Suite 400 Lincoln, NE 68509

Residential Soil Levels Are As Indicated Below:
VOC Exceedence Levels Noted Are In Parts Per Billion.
SVOC Exceedence Levels Noted Are In Parts Per Billion.
PCB Exceedence Levels Noted Are In Parts Per Billion.
TPH Exceedence Levels Noted Are In Parts Per Million.
Metals Exceedence Levels Noted Are In Parts Per Million.

Groundwater Exceedence Levels Noted Are In Parts Per Billion.

West Haymarket Redevelopment Site North Arena/Mixed Use Area Results

March 2011

Figure 9

GEOTECHNICAL ENGINEERING REPORT

Proposed Arena and Parking Garage

West Haymarket Project

Lincoln, Nebraska

PREPARED FOR

City of Lincoln
555 South 10th Street, Suite 300
Lincoln, NE 68508

December 29, 2010

benesch
engineers · scientists · planners

benesch
engineers · scientists · planners

Alfred Benesch & Company
825 J Street
Lincoln, NE 68508
www.benesch.com
P 402-479-2200
F 402-479-2276

December 29, 1010

Mr. Rick Peo
City of Lincoln
555 South 10th Street, Suite 300
Lincoln, NE 68508

REFERENCE: Geotechnical Engineering Report
Proposed Arena and Parking Garage
West Haymarket Project
Lincoln, Nebraska

Dear Mr. Peo:

Alfred Benesch & Company (Benesch) is pleased to submit the enclosed report that summarizes the findings of a soil and foundation engineering study and provides recommendations related to the design and construction of the foundation for the referenced project.

If any questions arise concerning this report or if additional information is needed about foundation conditions at this site, please contact Benesch for assistance.

Sincerely,

PROFESSIONAL ENGINEER
JASON E. HERR
E-12440
STATE OF NEBRASKA

12-29-10

Jason E. Herr, P.E.
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1.0 EXECUTIVE SUMMARY

PROJECT OVERVIEW

DLR Group has indicated that the proposed project will consist of the following:

Structure Type:	16,000 seat, four-story arena with an adjacent above grade parking garage.
Type of Foundation(s) Being Considered:	Deep foundation systems consisting of either driven piles or pressure-grouted auger cast piles.
Estimated Maximum Column Load:	Up to approximately 3,000 kips.
Estimated Maximum Wall Load:	Unknown at this time.
Estimated Maximum Floor Load:	Up to 500 psf for arena event floor, 100 psf for ancillary arena floor areas. Parking garage on-grade floor loading and fill loadings not available at this time.
Finished Floor Elevation(s):	Arena event floor elevation: 1157.0 feet (NAVD88). Parking garage lower level floor elevation has not been established to date.
Estimated Fill Heights:	4 to 13 feet in the arena area.

1 kip = 1,000 lbf

CONCLUSIONS

Preparation of Building Area

- Unsuitable floor and pavement subgrade materials extend to depths of up to 11 feet and should be removed and/or reworked.
- Existing fill materials (i.e., cinders and rubble) considered unsuitable for reuse as either fill or backfill materials were encountered at some boring locations to depths up to 5 feet below existing grade.
- Some of the unsuitable subgrade materials extend down to or beneath the water table. Unstable subgrade conditions might be present at the bottom of the excavations making it difficult to remove/rework the unsuitable subgrade materials and therefore might require that subgrade stabilization be performed as part of the grading operations.
- Some of the onsite soils that will require removal/reworking are saturated and will required drying prior to reuse as fill.
- Soils having petroleum fuel-like odors were detected within the borings performed within the east central and southeastern portion of the arena area. An environmental specialist should be contacted to evaluate any compliance and/or property development issues required to address these fuel-like odors and to avoid their entry into the arena facility.

Building Design

- The natural upper subsurface materials are not suitable foundation materials to support the proposed building super-structures on spread footings, thereby requiring that the arena and parking garage be supported on a deep-seated pile foundation system. Recommendations have been provide for the design and construction of auger cast piles and driven steel H-piles and pipe piles.
- The weight of the proposed fill and floor loadings within the arena will result in excessive settlement of the floor thus requiring that the arena floor area be preloaded and surcharged prior to the floor construction. An alternative to preloading and surcharging would be to construct a structural floor slab supported by the pile foundation system. Recommendations have been provided for the preloading and surcharging of the arena floor area.
- The natural soils will support lightly loaded column and continuous wall footings that are no more than 2 feet in width and seated on a minimum of 4 feet of controlled (compacted) earth fill. The supporting of light column and continuous wall footings on the controlled fill is predicated on the assumption that the arena building area is preloaded and surcharged. Suitable natural foundation material was encountered at depths ranging from 0.5 to 10.7 feet below existing grade at the boring locations.
- The parking garage design has not been finalized to date, and as such the need for either preloading and surcharging, or construction of a lower level structural floor supported by a pile foundation could not be determined as of the date this geotechnical report was prepared. The need for preloading and surcharging, or a structural floor within the parking garage will be addressed when the garage design has been defined. Those findings and recommendations will be presented in a subsequent geotechnical engineering report that will serve as an addendum to this report.

2.0 SUBSURFACE EXPLORATION

A program of Dutch friction-cone soundings, test borings and soil sampling was performed at the project site between September 24 and December 3, 2010. Thirty-three (33) Dutch friction-cone soundings were made at the site. The results of the soundings were used to determine the depths for obtaining undisturbed soil samples from an exploratory boring made immediately adjacent to each sounding. Thirty-four (34) exploratory borings were taken to depths of 79 to 104 feet below the existing grade to establish the general subsurface conditions of the area under consideration. Five (5) borings were performed to depths of 3.6 to 6.0 feet to sample soils in existing drainage ditches inside the proposed building area.

The Dutch friction-cone soundings were performed with a mechanical penetrometer in accordance with ASTM D 3441, Standard Method for Deep, Quasi-Static, Cone, and Friction Cone Penetration Tests of Soil. The plot of the data from this test identifies the relative positions and thicknesses of hard and soft layers of soil.

The borings were made in accordance with ASTM D 1452, Standard Practice for Soil Investigation and Sampling by Auger Borings. A machine-driven, hollow-stem auger having an inside diameter of 3-1/4 inches was used to advance the holes for split-barrel and thin-walled tube sampling.

Penetration tests were performed with a CME Automatic Free-Fall SPT Hammer (hammer efficiency approximately 80%) in accordance with ASTM D 1586, Standard Method for Penetration Test and Split-Barrel Sampling of Soils. Representative samples of soil were obtained for identification purposes. The resistance of the soil to penetration of the sampler, measured in blows per foot (N), is an indication of the relative density of cohesionless soil and of the consistency of cohesive soil.

Sixty-one (61) relatively undisturbed soil samples were recovered for visual observation and laboratory testing. This sampling was performed in accordance with ASTM D 1587, Standard Method for Thin-Walled Tube Sampling of Soil, utilizing open-tube samplers having outside diameters of 3.0 and 5.0 inches.

The vicinity map and the boring location plan are presented in Appendix A. The penetration diagrams (see Appendix B) present the results of the Dutch friction-cone soundings. The boring logs (refer to Appendix C) present the data obtained in the subsurface exploration. The logs include the surface elevations, the approximate depths and elevations of major changes in the character of the subsurface materials, visual descriptions of the materials in accordance with the criteria presented in Appendix D, groundwater data, the penetration resistance recorded in blows per 0.5-ft increments of depth, and the locations of undisturbed samples of soil.

The locations of the soundings and borings were determined by GPS by Benesch's survey crew. Water level readings were made in the auger borings at times and under conditions stated on the boring logs.

3.0 LABORATORY ANALYSES

The split-barrel and undisturbed soil samples obtained during the subsurface exploration were examined in the laboratory by a member of Benesch's professional engineering staff to supplement the field identification. Standard tests were performed on selected samples to determine the engineering properties of the foundation materials.

The moisture contents and dry unit weights of selected undisturbed soil samples were determined in the laboratory. These test results are presented in the boring logs opposite the respective sample locations. The moisture contents were determined in accordance with either ASTM D 4643, Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method, or ASTM D 2216, Standard Test Method for Determination of Water (Moisture) Content of Soil and Rock by Mass. The dry unit weights were determined in accordance with the Displacement Method of the Corps of Engineers, EM1110-2-1906, Appendix II, Unit Weights, Void Ratio, Porosity, and Degree of Saturation. These data correlate with the strength and compressibility of the soil. High moisture content and low density usually indicate low strength and high compressibility.

The unconfined compressive strengths of several undisturbed samples were estimated in the laboratory with a calibrated hand penetrometer. These strengths are presented on the boring logs and are estimates only. Actual values are generally lower than the estimated values indicated on the boring logs.

The compressibility of each of six (6) undisturbed samples of foundation soil was determined in accordance with ASTM D 2435, Standard Test Method for One-Dimensional Consolidation Properties of Soils, except that time-rate readings were not obtained. The data from the consolidation tests can be used to develop an estimate of the maximum amount of settlement of the structure. A brief summary of the test data is presented in Table 1, and the complete test reports are presented in Appendix E.

TABLE 1
CONSOLIDATION TEST DATA

Boring No.	Depth, ft	Initial Void Ratio	Overburden Pressure, tons/ft^2	Preconsolidation Pressure, tons/ft^2	Compression Index	Recompression Index
B-3	18.1 – 18.8	0.93	0.73	1.4	0.32	0.03
B-7	8.0 – 8.4	0.84	0.45	2.4	0.25	0.03
B-12	21.5 – 22.1	1.34	0.89	1.9	0.59	0.04
B-19	12.3 – 13.1	0.76	0.51	1.5	0.22	0.01
B-23	4.4 – 5.0	0.80	0.27	3.5	0.16	0.01
B-27	10.0 – 10.6	1.07	0.42	1.8	0.32	0.03

The unconfined compressive strengths of ten (10) undisturbed samples of subsurface soil were determined in accordance with ASTM D 2166, Standard Test Method for Unconfined Compressive Strength of Cohesive Soil. These data are summarized in Table 2, and the complete test reports are presented in Appendix F.

TABLE 2
UNCONFINED COMPRESSION TEST DATA

Boring No.	Depth, ft	Moisture, %	Dry Density, lbf/ft^3	Unconfined Compressive Strength, $tons/ft^2$
B-1	8.6 – 9.3	27.2	90.4	1.1
B-3	18.8 – 19.4	28.7	91.9	0.5
B-9	17.1 – 17.7	26.6	96.1	1.2
B-19	13.1 – 13.9	32.3	88.8	0.5
B-20	22.6 – 23.2	38.8	81.0	0.9
B-23	5.0 – 5.5	28.3	91.4	0.9
B-25	6.6 – 7.1	26.7	95.7	1.3
B-27	10.6 – 11.3	37.6	77.5	0.9
B-30	7.2 – 7.9	22.3	97.6	1.6
B-33	16.6 – 17.3	28.6	93.1	0.9

Consolidated-undrained triaxial compression tests were performed on three (3) samples of subsurface soils to provide data on the shearing strength of these materials. The triaxial compression tests were performed in accordance with ASTM D 4767, Standard Test Method for Consolidated-Undrained Triaxial Compression Test on Cohesive Soils. Specimens were backpressure saturated prior to shearing. Pore pressure measurements were taken during shearing, thus permitting both total stress and effective stress strength parameters to be determined. A summary of the test data is shown in Table 3, and the complete test reports are presented in Appendix G.

TABLE 3
TRIAXIAL COMPRESSION TEST DATA

Boring No.	Depth, ft	Friction Angle (ϕ), deg	Cohesion (c), lbf/ft^2
B-1	8.6 – 9.3	14.8[a]	740[a]
		27.0[b]	300[b]
B-21	6.7 – 7.4	19.2[a]	260[a]
		32.5[b]	150[b]
B-25	6.0 – 6.6	19.7[a]	420[a]
		32.0[b]	170[b]

[a]Total stress value.
[b]Effective stress value based on effective stress path plots.

The plasticity characteristics of two (2) air-dried samples of soil were determined in accordance with ASTM Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (D 4318). These limits of consistency (Atterberg limits) are used in the Unified Soil Classification System as a basis for laboratory differentiation between materials of appreciable plasticity (clays) and slightly plastic or nonplastic materials (silts). The test results are presented in Table 4.

TABLE 4
ATTERBERG LIMITS

Boring No.	Depth, ft.	Liquid Limit, %	Plastic Limit, %	Plasticity Index	Group Symbol
B-4	0.5 – 3.5	29	13	16	SC
B-8	2.0 – 5.0	51	22	29	CH

Determinations of the distribution of particle sizes in samples of two (2) subsurface materials were made in accordance with AASHTO Designation T 88, Standard Method of Particle Size Analysis of Soils. The composition of each of these samples is presented in Table 5.

TABLE 5
PARTICLE-SIZE DATA

Boring No.	Depth, ft.	Percent Gravel (Greater than 4.76 mm)	Percent Sand (0.074-4.76 mm)	Percent Silt (0.002-0.074 mm)	Percent Clay (Less than 0.002 mm)
B-4	0.5 – 3.5	0	64	19	17
B-8	2.0 – 5.0	0	14	58	28

The moisture-density relations of two (2) representative samples of potential onsite borrow material were determined in accordance with ASTM D 698, Procedure A, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf./ft^3) (600 kN-m/m^3). A summary of the test results are presented in Table 6, and the complete test reports are presented in Appendix H.

TABLE 6
MOISTURE-DENSITY RELATIONS TEST DATA

Boring No.	Depth, ft	Soil Type	Group Symbol	Sand Content %	Standard Maximum Dry Unit Weight, lbf/ft^3	Optimum Moisture Content, %
B-4	0.5 – 3.5	Clayey Sand Alluvium	SC	64	112.0	15.0
B-8	2.0 – 5.0	Fat Clay Fill	CH	14	87.5	22.5

A series of chemical tests were performed on six (6) representative samples of subsurface soil. These tests were used to evaluate the soils for specific chemical factors that could be aggressive to concrete and steel. The results of the tests are presented in Table 7.

TABLE 7
CHEMICAL TESTS ON SOIL SAMPLES

Boring No.	Depth, ft.	pH	Redox Potential, mV	Sulfates, mg/kg	Sulfides, mg/kg	Chlorides, mg/kg
B-1		6.8	336	28	N.D.	1
B-2		7.0	307	31	N.D.	4
B-5		6.9	325	4	N.D.	N.D.
B-13		6.8	308	15	N.D.	2
B-27		6.5	279	361	52	4
B-30		6.7	308	28	N.D.	2

N.D. – Not Detected

4.0 GEOLOGY AND SITE CONDITIONS

The project site lies in the Dissected Till Plains section of Nebraska, a part of the Central Lowland province of the Interior Plains physiographic division[1]. The project site is located in west-central Lincoln, Nebraska, on alluvial bottomlands adjacent to Salt Creek. The bottomlands are a flood plain setting consisting of relatively deep deposits of alluvium. Soils generally consist of silty and clayey alluvium near the surface overlying sandy and gravelly alluvium that is underlain by the Dakota bedrock formation.

The subsurface materials encountered at the boring locations generally consisted of existing fill overlying mostly cohesive alluvial soils to a depth of approximately 20 to 30 feet. Some of the existing fill is comprised of rubble and/or cinders that are not considered suitable for reuse as controlled (compacted) earth fill. Fill materials were encountered at some of the boring locations up to depths as great as 10.7 feet below existing grade. The fill materials are not uniformly well compacted and, therefore, are considered unsuitable to remain within the building areas. The depths that fill materials (both those unsuitable and suitable for reuse as fill and backfill) extend below existing grade, at each boring location, are shown in Table 8 below. Sandy alluvium was encountered below the cohesive alluvium down to the top of Dakota sandstone. The sandy alluvium has densities that range from very loose to very dense. The depth to unweathered Dakota sandstone ranged from 74.5 to 94.0 feet below existing grade. The Dakota formation encountered at the 34 boring locations is comprised of silty sand materials (sandstone) that is moderately soft bedrock which is non- to slightly cemented. The sandstone contains some ironstone layers, which are very hard, highly-cemented iron oxide concretions.

Detailed descriptions of the materials encountered at each boring location are provided in the boring logs, which are presented in Appendix C. The depths and elevations of the bottom of existing unsuitable and suitable fill materials, the groundwater, and the surface of the unweathered Dakota sandstone at each boring location are shown in Table 8.

A petroleum-like odor was detected in those soils encountered down to the water table at borings B-15, B-20, B-21, B-26, B-27, B-31, B-32 and B-33. The boring location plan in Appendix A shows that these borings are generally located within the east-central and southeastern corner of the proposed building area. Consultation with an environmental specialist should be considered to evaluate any compliance and/or property development issues related to this petroleum-like odor.

[1] Physiographic Provinces of North America, Map by A. K. Lobeck, 1948; The Geographical Press; Columbia University, New York

TABLE 8
DEPTH AND ELEVATION OF "BOTTOM" OF SUITABLE & UNSUITABLE FILL MATERIALS, GROUNDWATER SURFACE ELEVATION AND ELEVATION OF UNWEATHERED BEDROCK MATERIAL

Boring No.	Unsuitable Fill & Topsoil Depth, ft[1]	Topsoil & Unsuitable Fill Elev., ft	Suitable Fill Depth, ft	Suitable Fill Elev., ft	Ground Water Depth, ft	Ground Water Elev., ft	Bedrock Depth, ft	Bedrock Elev., ft
B-1	4.6	1146.3	7.3	1143.6	14.0	1136.9	94.0	1056.9
B-2	2.7	1147.1	**10.7** [2]	1139.1	8.3	1141.5	93.5	1056.3
B-3	1.4	1143.5	1.4	1143.5	7.4	1137.5	89.5	1055.4
B-4	3.0	1142.3	3.0	1142.3	8.4	1136.9	87.0	1058.3
B-5	1.3	1149.6	4.1	1146.8	13.0	1137.9	90.5	1060.4
B-6	2.4	1148.7	6.5	1144.6	12.5	1138.6	90.5	1060.6
B-7	3.5	1146.0	3.5	1146.0	6.6	1142.9	87.0	1062.5
B-8	2.5	1142.8	**6.0** [2]	1139.3	5.3	1140.0	84.0	1061.3
B-9	0.0	1144.6	0.0	1144.6	7.5	1137.1	83.0	1061.6
B-10	1.6	1144.9	1.6	1144.9	8.0	1138.5	85.0	1061.5
B-11	2.3	1148.8	3.8	1147.3	12.1	1139.0	86.0	1065.1
B-12	2.5	1146.4	3.0	1145.9	9.2	1139.7	92.5	1056.4
B-13	2.3	1146.8	3.0	1146.1	9.0	1140.1	87.5	1061.6
B-14	0.0	1146.0	1.0	1145.0	5.3	1140.7	83.0	1063.0
B-15	0.0	1145.1	4.5	1140.6	5.3	1139.8	82.0	1063.1
B-16	0.0	1146.8	5.3	1141.5	8.8	1138.0	83.0	1063.8
B-17	0.0	1151.0	3.0	1148.0	12.3	1138.7	85.0	1066.0
B-18	0.0	1148.8	3.5	1145.3	10.6	1138.2	87.5	1061.3
B-19	0.0	1146.3	0.8	1145.5	5.2	1141.1	77.0	1069.3
B-20	3.5	1142.6	3.5	1142.6	4.7	1141.4	77.0	1069.1
B-21	0.0	1147.1	5.5	1141.6	8.0	1139.1	77.5	1069.6
B-22	0.6	1150.8	4.0	1147.4	12.5	1138.9	76.0	1073.4
B-23	2.1	1148.8	3.5	1147.4	13.3	1137.6	85.0	1065.9
B-24	0.0	1148.3	3.5	1144.8	8.5	1139.8	82.5	1065.8
B-25	0.0	1146.9	1.0	1145.9	6.5	1140.4	77.5	1069.4
B-26	1.5	1145.0	2.2	1144.3	2.8	1143.7	77.0	1069.5
B-27	0.0	1149.7	**6.0** [2]	1143.7	5.0	1144.7	80.5	1069.2
B-28	2.7	1149.8	8.5	1144.0	12.4	1140.1	77.5	1075.0
B-29	1.8	1149.2	3.5	1147.5	13.0	1138.0	83.0	1068.0
B-30	0.0	1148.5	3.5	1145.0	10.1	1138.4	77.0	1071.5
B-31	1.3	1146.8	1.3	1146.8	7.5	1140.6	77.0	1071.1
B-32	1.7	1146.7	2.5	1145.9	3.6	1144.8	74.5	1073.9
B-33	1.5	1148.6	8.5	1141.6	11.1	1139.0	77.0	1073.1
B-34	0.0	1152.2	5.0	1147.2	12.4	1139.8	75.5	1076.7
B-03A	**0.0** [2]	1142.7	-	-	-0.2	1142.9	-	-
B-04A	**2.3** [2]	1140.1	-	-	0.9	1141.5	-	-
B-08A	1.5	1141.2	-	-	2.4	1140.3	-	-
B-15A	**3.0** [2]	1139.1	-	-	-0.9	1143.0	-	-
B-19A	**0.0** [2]	1142.7	-	-	-0.6	1143.3	-	-

[1]Unsuitable fill materials consist of rubble, cinders, organics and/or topsoil.
[2]Bottom of soil layer below water table.

5.0 DISCUSSION AND RECOMMENDATIONS

DISCUSSION

The proposed arena will be raised with controlled earth fill up to a level above the 500 year flood elevation which will place the arena floor at an elevation of 1157.0 feet. In general, seven (7) or more feet of fill will generally be constructed over the arena area. The proposed floor loads within the arena area are estimated to range from 100 to 500 lbf/ft^2. Based on the results of the subsurface investigation and laboratory testing, the natural alluvium has the potential to be compressible both under the heavy column loads, and proposed permanent fill and floor loads. Settlements induced from floor loads alone are estimated to be as high as 0.5 inches and 3.0 inches for floor loads of 100 and 500 lbf/ft^2, respectively. These floor load combined with the weight of the proposed fill is computed to increase the magnitude of settlement within the arena event floor area to 5.0 to 6.0 inches. Due to the geologic conditions under which the soils were deposited within this alluvial bottomland area, the degree of compressibility can vary greatly across the project site. If the proposed arena floor structure is constructed on natural alluvium without any prior modification of the subsurface soils, excessive total and differential settlements of the arena floor structure will occur. In addition, the heavy arena and parking garage footing loads will also lead to excessive total and differential settlements. The following geotechnical engineering design should be implemented to avoid excessive structure settlement:

A. **Deep Foundations.** The proposed arena and parking garage structures should be supported on a deep foundation system (i.e. auger cast piling, driven H-piles or pipe piles) seated in the unweathered Dakota sandstone bedrock.

B. **Preloading and Surcharge, or a Structural Floor System.** The arena building site should first be preloaded by constructing the permanent compacted fill up to the proposed building pad finished floor subgrade level. Secondly, the floor area should then be temporarily filled to preload for the proposed floor loading conditions and surcharged for the combined fill and floor loading conditions. Once primary consolidation (under the weight of the temporary preload and surcharge fill) of the compressible alluvium has been achieved, the temporary preload and surcharge fill placed above the permanent compacted fill can be removed and the floor slabs constructed on the prepared floor subgrade soils. An alternative to preloading and surcharging would be to construct a structural floor system supported entirely by the deep foundation system (i.e., piling).

The natural alluvium will support "lightly-loaded" shallow foundations if Recommendations 7 through 10 are followed.

The parking garage design has not been finalized to date and as such the need for either preloading and surcharging, or construction of a structural floor could not be determined. The need for preloading and surcharging, or a structural floor within the parking garage will be addressed when the garage design has been further established. Those findings and recommendations will be presented in a subsequent geotechnical engineering report that will serve as an addendum to this report.

The following recommendations for design and construction of the foundation for the proposed arena are based upon site conditions, the engineering properties of the subsurface materials and the requirements of the proposed structures.

RECOMMENDATIONS

1. SUITABLE FLOOR AND PAVEMENT SUBGRADE MATERIAL

Topsoil, existing fill and/or the existing soils located to a minimum of 0.5 feet below existing grade at each boring location should ***not*** be used to support the floor slab, pavement structure or new fill. The depths of existing fill (both those suitable and unsuitable for reuse as fill material) are shown in Table 8. The underlying natural alluvium may be left in the building area and areas to be paved if these soils are "wet" and prove stable under a loaded dump truck or similar piece of equipment. By Benesch's definition, a "wet" cohesive soil contains sufficient moisture to be rolled into a 1/8-inch-diameter thread without crumbling. A "moist" cohesive soil would crumble when being rolled to form a 1/8-inch-diameter thread.

As earlier stated, soils having fuel odor were detected within the east central and southeastern corner of the arena area. An environmental specialist should be consulted to evaluate any compliance and/or property development issues required to address these petroleum-like odors with the intent of avoiding/preventing their entry into the arena facility.

2. EXISTING UTILITY LINES

Existing utilities are currently located within the proposed building construction areas. The utility line backfill is not considered suitable foundation material for support of lightly loaded shallow foundations (See Recommendation 7 for a definition of lightly loaded footings). Lightly loaded *"wall"* footings that intercept the backfill materials of these utilities could be designed to bridge over the backfill. For lightly loaded *"column"* footings, the difference in elevation between the bottom of the column footing and the bottom of an existing utility trench should not be greater than the horizontal distance between the nearest edge of the utility trench and the closest edge of the column footing. Column footings may need to be lowered below plan footing depth to meet this recommendation.

An alternative to wall footings bridging over the backfill and the lowering of column footings would be to remove all utility backfill, relocate the utilities outside the building area, and backfill the excavations with controlled earth fill. A second alternative would be to remove all existing utility backfill and re-compact the backfill into the resulting excavation in accordance with the moisture content and compaction recommendations presented in Table 11. This second alternative is proposed based on the assumption that the utility lines can withstand the stresses imposed by the compacted fill and footing loads.

3. PREPARATION OF THE BUILDING AREA AND AREAS TO BE PAVED

All existing fill and topsoil materials located in the building area above the depths presented in Table 8 should be either removed and replaced with controlled earth fill or reworked to conform to the moisture content and compaction recommendations presented in Table 11. The removal or reworking of these materials should extend beyond the outside edges of the proposed building area a minimum horizontal distance of 5.0 feet or two-thirds the distance between surface grade and the surface of the suitable natural subgrade/foundation material, whichever is greater. The sides of the excavation should be sloped to permit the controlled earth fill to be placed against the sides of the excavations to the recommended degree of compaction. Thereafter, the exposed ground located in areas that have been "cut" to the proposed subgrade elevations and areas to be filled should be proof-rolled with a loaded dump truck or similar piece of equipment (in the presence of the Geotechnical Engineer) to locate unstable materials. Any unstable material should be either removed and

replaced with controlled earth fill or reworked to conform to the moisture content and compaction recommendations presented in Table 11.

The over-excavation of existing fill materials in some areas will extend to within 1.0 feet of the water table or below. The bottoms of these excavations might become disturbed by repeated passes of construction equipment during excavating operations if groundwater conditions at the time of grading are the same as at the time of the subsurface exploration. If possible, excavation operations should take place during a dry period, such as July or August. To prevent excessive disturbance, the final one to two feet of materials in the excavations may need to be removed with track-type equipment instead of rubber-tire equipment. Alternatives for stabilizing unstable areas to provide a stable working platform for the placement of compacted fill are given in Recommendation 10.

The Geotechnical Engineer should observe the building area and areas to be paved to verify that all unsuitable and unstable soils have been either removed and replaced, or reworked. Upon approval of the site by the Geotechnical Engineer, any exposed ground surface that has not been previously reworked and that will not become disturbed by grading activities should be scarified to a minimum depth of 6 inches and reworked to conform to the moisture content and compaction recommendations presented in Table 11. Areas to be filled should then be raised to the desired elevation with controlled earth fill.

Immediately prior to placement of the pavement structure and floor slabs, the subgrade in cut and fill sections should be scarified to a minimum depth of 6 inches and reworked to a uniform condition conforming to the moisture content and compaction recommendations presented in Table 11.

Any lightly loaded wall or column footings should be seated on suitable foundation material as described in Recommendation 7. The Geotechnical Engineer should observe the foundation excavations to verify that lightly loaded spread footings are seated in suitable foundation materials.

4. OSHA AND BNSF EXCAVATION SAFETY REQUIREMENTS

Excavations that will be occupied by personnel should be made in accordance with the Occupational Safety and Health Administration (OSHA) Construction Standards-29 CFR Part 1926, Subpart P-Excavations as published in the Federal Register, Vol. 54, 209, Tuesday, October 31, 1989, Rules and Regulations. OSHA states that a soil should be reclassified if the properties, factors, or conditions affecting the soil's classification change in any way. Sheet piling and/or shoring will be necessary if the sides of the excavations cannot be sloped to meet OSHA regulations.

Excavations that are proposed to be made below existing grade and adjacent to operating railroad tracks should meet BNSF Railway requirements and be reviewed by the Geotechnical Engineer to confirm their being safe under train movement loadings.

5. SUBGRADE STABILIZATION

Natural alluvium consisting of soft to medium stiff clays and very loose to loose silts and sands might require subgrade stabilization in order to allow new fill to be compacted to the required compaction recommendations presented in Table 11. For this reason, a cost should be established within the grading contract for the performance of subgrade stabilization operations (as discussed below). For design and bidding purposes, Benesch suggests the assumption be made that subgrade stabilization will be required over 20% of the

proposed arena and parking garage areas. It should be understood that the actual quantity of stabilization could vary considerably depending upon the time of construction and rainy seasonal activities just before and at the time of construction. The actual extent of stabilization required should be determined in the field by the Geotechnical Engineer at the time of construction. Alternative means for providing subgrade stabilization are presented below:

A. **Stabilizing with Granular Materials.** Areas that could develop unstable subgrade soil conditions during performance of the excavation and backfilling operations could be stabilized using crushed rock or clean free-draining sands or sand-gravels. The thickness of rock or clean free-draining granular materials necessary to provide a stabile foundation for the subsequent placement of conventional compacted fill would likely be 12 to 18 inches if initial filling operations are performed using light- to moderate-sized construction equipment. A "well-graded" crushed rock such as shown in Table 9 (NDOR Foundation Course Mixture) should be used to prevent migration of the underlying soils into the crushed rock stabilization material. The surface and bottom of coarser (than the gradation shown in Table 9), clean, open-graded rock used for stabilization purposes should be wrapped with a layer of geotextile to prevent migration of the overlying and underlying fine grained materials into the stabilization material so as to prevent future settlement.

TABLE 9
GRADATION REQUIREMENTS FOR "WELL-GRADED" STABILIZATION MATERIAL

Sieve Size	Percent Passing by Weight
1 in. (25.0 mm)	100
No. 10 (2.00 mm)	50 – 74
No. 40 (0.425 mm)	26 – 42
No. 200 (0.075 mm)	6 – 12

B. **Stabilizing with a Geotextile and Granular Materials.** Areas that could develop unstable soil conditions could be stabilized using geotextile, and either clean free-draining sands or sand-gravels, or crushed rock. The thickness of rock or free-draining granular materials when used in conjunction with a geotextile (such as Mirafi 600X, Mirafi BXG11, Trevira 011/450, Tensar BX1100) is expected to be from 6 to 12 inches if the initial filling operations are performed using light- to moderate-sized construction equipment. If a geogrid (such as Tensar BX1100, TX140 or Mirafi BXG11) is used, the crushed rock would need to be properly graded to prevent migration of the rock through the geogrid and into the underlying soils. Aggregate meeting the gradation requirements shown in Table 9 should be considered for use as stabilization material on this project.

If coarser open-graded rock, then that presented in Table 9, is utilized for stabilization purposes, Benesch suggests that a geotextile filter fabric (such as one of the ones discussed immediately above) be used with geogrid to help prevent the migration of smaller rock or clean free-draining granular materials through the openings in the geogrid, or the migration of soil located below the geogrid up through the rock. Additionally, the surface of such coarser open-graded rock that is used for stabilization purposes should be ***capped*** with a layer of geotextile to prevent migration of the overlying cohesive fill materials into the stabilization material (which could result in future settlement).

C. **Fly Ash Stabilization.** This alternative consists of stabilizing the upper 6 to 12 inches of natural soils that could become disturbed under construction traffic with a suitable type of fly ash (generally Class C) having pozzolonic (self-setting/cementing) properties. Fly ash should be placed and compacted when the ambient temperature is greater than 40° F. The fly ash should be applied and blended into the soils in a uniform manner. The anticipated quantities of fly ash that would need to be added to the unstable soils are 10 to 15% by total dry weight of soil. The soils should be mixed to distribute the fly ash uniformly throughout the soils. It should be noted that excessive disturbance of the underlying unstable soils might occur if heavy rubber-tired equipment is used either during (a) the application of the fly ash or (b) the mixing of the fly ash with the soils. The mixture should cure until the moisture content has reduced sufficiently to allow proper compaction and the preparation of a stable subgrade. Approximately four to ten hours curing time might be necessary to adequately cure the fly ash/soil mixture. After curing, the mixture should be compacted to the highest density possible "without yielding" of the underlying soft soils under light- to moderate-sized construction equipment.

Stabilization in accordance with Alternative C should ***not*** be performed if the base of the original excavation is located below the groundwater level. Stabilization of subgrade conditions that extend below the groundwater level, or even within approximately 1.0 feet of the groundwater level, should be performed using the stabilization techniques discussed under Alternatives A or B. In addition, greater thicknesses of fly ash subgrade might be required if unstable soils are encountered within areas that will receive minimal fill (i.e., less than 1.0 feet of new fill). Specific recommendations for incorporating fly ash into soils to facilitate their stabilization under these circumstances could be provided at the time of construction if the need arises. Stabilization operations performed in accordance with either Alternatives B or C should be performed at sufficient depth to allow for a minimum of 4.0 feet of compacted earth fill to be constructed atop the stabilization operations.

6. STEPPING AND BENCHING OF EXISTING SLOPES

The existing embankment slopes that will receive new fill should be stepped and benched in order to bond the new fill materials with the existing soils. The base of each step should be cut as nearly horizontal as possible and the face of each step should be cut no steeper than 0.5[H]:1.0[V]. Slopes flatter than 5.0[H]:1.0[V] need not be stepped and benched.

7. SUITABLE LIGHTLY-LOADED SHALLOW FOUNDATION MATERIAL

The natural alluvium is considered suitable foundation material for lightly loaded wall and column footings if these spread footings are no more than 2 feet wide and seated on a minimum of 4 feet of controlled earth fill placed on top of the alluvium. Based on the allowable bearing pressure stated in Recommendation 9, this would equate to footings for column and wall loads of less than 6.0 kips and 3.0 kips/ft, respectively (1 kip = 1,000 lbf). Controlled earth fill is defined as earth fill that is designed, compacted, and tested in accordance with generally accepted good practice and placed with observation by the Geotechnical Engineer. The depth to natural alluvium is equal to the depth of suitable fill in Table 8.

8. MINIMUM DEPTH OF FOOTINGS

The bottoms of all exterior footings should be placed at a minimum depth of 40 inches below finished grade to provide reasonable protection against frost action and seasonal volume change.

9. ALLOWABLE BEARING PRESSURE FOR LIGHTLY-LOADED SHALLOW FOUNDATIONS

The allowable net bearing pressure on the controlled earth fill is 1,500 lbf/ft^2. The net bearing pressure is the contact pressure at the base of the foundation in excess of the pressure at the same level due to the surrounding surcharge. The surcharge pressure is equal to the total weight of a column of soil that extends from the lowest immediately adjacent ground surface to the bottom of the foundation divided by the soil column's area.

10. SETTLEMENT OF LIGHTLY-LOADED SHALLOW FOUNDATIONS

Settlement of shallow "lightly" loaded spread footings is expected to be negligible (less than 1/4 inch) if the fill materials are properly placed (see Recommendation 16) and the recommendations in this report are carried out.

11. VERTICAL MODULUS OF SUBGRADE REACTION

The suggested value of the vertical modulus of subgrade reaction to be used inside and outside the proposed structure is 150 and 75 lbf/in^3, respectively.

12. LATERAL EARTH PRESSURE AND RETAINING WALL DESIGN

Any basement-type wall or retaining wall should be designed to withstand the pressure from the backfill. The pressure exerted by the backfill against the walls should be computed on the basis of the equivalent-fluid theory, by which the lateral pressure is considered to be caused by a fluid having a unit weight such that the total pressure of the soil and the so-called equivalent fluid are the same. The equivalent-fluid unit weights of the various recommended backfill materials, placed in accordance with Recommendation 16, are shown in Table 10. In order for the unit weights of sandy soils to be applicable, the sand should occupy the area presented in Figure 1. The clay cap (if needed) will not significantly affect the magnitude of lateral pressures on the wall if the clay cap comprises less than 20% of the total soil column in-front or behind the wall, and as such the clay soil can be assumed have the same properties as the granular materials below. The active and passive fluid weights are based on the assumption that the ground surface is level in front and behind walls.

TABLE 10
RECOMMENDED LATERAL EARTH PRESSURE PROPERTIES

Soil Type	Equivalent-Fluid Unit Weight (lbf/ft^3)						Moist Unit Weight (lbf/ft^3)	Base Friction Coefficient
	Unsaturated			Saturated (Includes Hydrostatic Pressures)				
	Active	At Rest	Passive	Active	At Rest	Passive		
Clays and Silts	50	70	240	75	85	140	120	0.35[1]
Silty and Clayey Sands[2]	35	55	280	75	85	155	125	0.45
Sand[3]	30	50	300	75	85	170	115	0.55

[1]Base friction resistance should also be evaluated for adhesion. Recommended adhesional friction is 1,000 lbf/ft^2.
[2]More than 10% silt and clay.
[3]Less than 10% silt and clay.

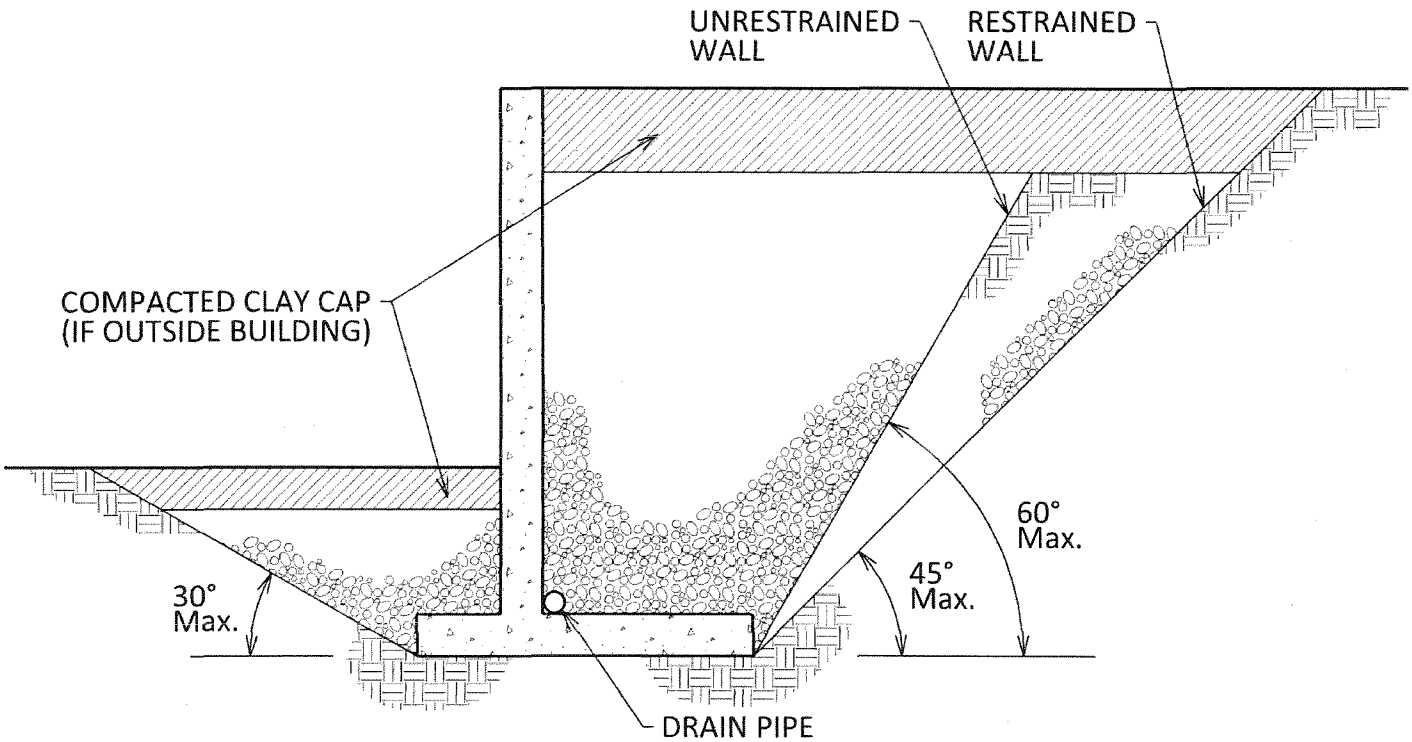


FIGURE 1. REQUIRED AREA FOR SAND PLACED IN FRONT AND BEHIND BASEMENT AND RETAINING WALLS

In calculating the passive-earth-pressure resistance, the upper 40 inches (from finished grade) should not be assumed to contribute resistance against horizontal movement if exposed to frost action or seasonal moisture/volume change of the soil. The suggested equivalent-fluid unit weight for calculating the passive-earth-pressure resistance is shown in Table 10.

Additional resistance to horizontal movement will be provided by frictional resistance between the base of the footing and the foundation soil. The recommended base friction coefficients are shown in Table 10. In order to assume the higher base friction coefficients for the granular soils, the granular soils should extend to a depth of at least 1.5 times the foundation width below the bottom of foundation. For clays and silts, the base friction might be controlled by either the undrained shear strength of the foundation soil (adhesional friction) or the drained friction angle of the foundation soil (friction coefficient). The adhesional friction is independent of the footing load. The minimum (dead) load on the footing should be used with the friction coefficient to calculate drained frictional resistance. The lesser of either the undrained or drained frictional resistance should be used for design. If a keyed retaining wall foundation is being considered to increase sliding resistance, Benesch should be contacted for further recommendations.

The backfill above a retaining wall footing will help resist overturning of the wall. Wet unit weights shown in Table 10 should be used in calculating the weights of backfill above a retaining-wall footing. A minimum factor of safety of 1.5 should be applied to the overall retaining-wall design. The maximum soil pressure beneath a retaining-wall footing should not exceed the bearing pressure presented in Recommendation 9.

13. RETAINING WALL DRAINS

A drainage system (consisting of a slotted drainpipe encased in granular filter material) should be installed behind any retaining wall to intercept surface water that might enter the backfill. The 4-inch-diameter drainpipes (with 1/8-in. slots) should be backfilled with fine aggregate for State of Nebraska "47B" concrete (hereinafter referred to as "sand-gravel"). The pipes should have a minimum of 4 inches of sand-gravel encasing the bottoms and sides, and the sand-gravel should extend to within 2 feet of finished grade. It is recommended that the last two feet of backfill consist of compacted clay, especially when located outside the proposed building.

The drains should discharge (a) into a sump from which the water can be pumped to a positive outfall, such as a drainage ditch, swale or storm sewer, or (b) by gravity to the low areas. An alternative to encasing the pipes with sand-gravel would be to wrap the lines with a geotextile. Fine sand could then be used in lieu of the sand-gravel. Any granular backfill placed outside the proposed building area should be capped with at least two feet of clay.

The arena and parking garage are not scheduled to have basements. Recommendations for the installation of an underfloor and perimeter basement drainage collection system should be requested in the event that a basement(s) is part of either of these structures design.

14. PROTECTIVE SLOPES AROUND THE BUILDING

The site should be graded in a manner that will divert water away from the buildings. The protective slopes around the buildings should meet the following requirements:

A. Slope downward from the building to lower areas or drainage swales.
B. Minimum horizontal length of 10 feet, minimum vertical fall of 6 inches (5 percent).
C. Minimum gradient (beyond 10 feet from building):
   1. Impervious surface; 1/8 inch per foot (1 percent).
   2. Pervious surface; 1/4 inch per foot (2 percent).

15. TYPES OF SOILS TO BE USED AS FILL AND BACKFILL

Controlled earth fill placed within the building area and areas to be paved should be constructed of inorganic CL[2], ML[3], SM[4], and/or SC[5] materials (all with a liquid limit less than 50 and a plasticity index less than 30). The natural alluvium and existing fill materials indicated as being "suitable for reuse as fill" in Table 8, are considered suitable for reuse as fill within the building areas and areas to be paved. It should be noted, however, that some of the subsurface materials are high in moisture content and would require manipulation (drying) to achieve the moisture content necessary for proper compaction.

The "unsuitable fill for reuse as fill" materials shown to the depths presented in Table 8 (that contain more than 25% cinders, ballast or rubble) should be either wasted or uniformly blended with cohesive materials such that the blended material contains no more than 25% cinders, ballast or rubble. The blended materials can be used to construct the building pad located both within and outside the proposed building area. It is highly recommended that any of these types of blended fill materials be used to construct only those lower portions of fill located more than 5 feet below finished subgrade level, and below the depths of proposed footing excavations and utility installations.

It is recommended that *"imported"* borrow material used for building pad construction consist of cohesive silty lean clay, lean clay, lean clay with sand, or sandy lean clay materials.

The materials used as fill and backfill outside the building area and areas to be paved may consist of CL, ML, SM, SC, and/or CH (fat clay, fat clay with sand, and/or sandy fat clay). Proposed fill and backfill materials should be subject to approval by the Geotechnical Engineer. Representative samples of the proposed fill and backfill materials should be submitted to the Geotechnical Engineer at least three days prior to placement so the necessary laboratory tests can be performed.

16. PLACEMENT OF FILL AND BACKFILL

The suggested basis for controlling the placement of fill and backfill on the site, excluding free-draining granular materials, are the "optimum moisture content" and "maximum dry density" as determined by ASTM D 698, Procedure A, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using **Standard**

[2] Lean clay, lean clay with sand and sandy lean clay.
[3] Silt, silt with sand and sandy silt.
[4] Silty sand.
[5] Clayey sand.

Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3). The recommended acceptable values of moisture content and degree of compaction are given in Table 11.

TABLE 11
COMPACTION RECOMMENDATIONS FOR CONTROLLED EARTH FILL AND BACKFILL PLACED WITHIN THE BUILDING AND PAVED AREAS

Location	Soil Type	Minimum Moisture Content	Minimum Compaction*
Within the building area.	Glacial Till	Optimum	98%
	Silts and Lean Clays	2% Below Optimum	98%
	Silty and Clayey Sands	**	100%
From 0.0 to 1.0 foot below pavement subgrade elevation (outside the building area).	Glacial Till	Optimum	100%
	Silts and Lean Clays	2% Below Optimum	100%
	Silty and Clayey Sands	**	100%
Greater than 1.0 foot below pavement subgrade elevation (outside the building area) and utility trenches greater than 5 feet deep.	Glacial Till	Optimum	95%
	Silts and Lean Clays	2% Below Optimum	95%
	Silty and Clayey Sands	**	95%
Backfill of footings and utility trenches less than 5 feet deep (outside the building area and outside of areas to be paved).	Silts and Clays	2% Below Optimum	92%

*Percent of Maximum Dry Density (ASTM D 698, Procedure A)
**Moisture as necessary to obtain density (near Optimum)

Clean free-draining sand used as backfill should be consolidated by means of a vibratory compactor to at least 60% "relative density", as determined in accordance with ASTM D 4253 (Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table) and D 4254 (Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculations of Relative Density).

17. SITE SEISMICITY

Based on the geotechnical investigation at this site, coupled with Benesch's knowledge of subsurface conditions elsewhere in the general Lincoln area, we recommend that Site Class D (S_D) be used to assess lateral loads from seismic events in accordance with the 2009 International Building Code (IBC). The lateral loads may be transmitted from the structure to the surrounding soils by a combination of base friction and passive resistance on the footings. Overturning loads may be reacted by the dead weight of the structure and bearing

resistance of the foundation soils. The allowable bearing capacity given previously may be increased by one third to assess stability from transient seismic forces.

Seismic forces on earth retaining structures may be evaluated using various pseudo-static methods of analysis. Benesch recommends that horizontal and vertical acceleration coefficients of 0.04g and 0.02g, respectively, be used to assess seismically induced active and passive earth pressures on earth retaining structures with pseudo-static methods.

18. PRELOADING AND SURCHARGE LOADING AND MONITORING

As previously stated, excessive floor settlement (i.e., 5 to 6 inches) is predicted to occur under the proposed permanent fill and maximum floor loading (500 lbf/ft^2) conditions. The arena floor could be designed and constructed as a structural floor supported entirely by the deep seated pile foundation system. An alternative to designing a structural floor system supported by piling would be to preload and surcharge the building floor area to force consolidation of the compressible subsurface soils prior to installation of the deep foundation system and the subsequent construction of a conventional floor system bearing on the fill and underlying natural soils.

Preloading and surcharging to induce settlement of the compressible alluvial subsurface materials should consist of (1) the construction of permanently placed controlled earth fill up to the proposed finished floor subgrade level, (2) the placement of additional permanent controlled earth fill equal in height to the computed magnitude of settlement predicted to occur (i.e., 0.5 feet), (3) the placement of truck dumped temporary earth fill (preload) equal in weight to the proposed floor loading condition, and (4) the placement of temporary surcharge fill equal to a percentage of the combined weights of the controlled earth fill and proposed floor loading --- to facilitate consolidation in a timely manner (i.e., a month or less time). The temporary preload and surcharge materials, installed above the permanent fill level, are generally defined as leveled, truck-dumped soils having minimal compaction (i.e.- wheel compacted with a "wet" density greater than 100 lb/ft^3). Full-depth temporary preload and surcharge fill heights should extend beyond the extents of the proposed given floor loading areas a minimum distance of 10 feet. To minimize settlement of existing structures and/or utilities, the edge of the full-depth surcharge areas should be located a minimum of 25 feet from any existing structures or utilities.

If the permanent fill will be placed up to an elevation of 1157.0 feet, it is recommended that 10.75 feet of "temporary" preload and surcharge fill be constructed over that portion of the building area having 500 lb/ft^2 floor loadings. This 10.75 feet of temporary preload and surcharge fill, when constructed in accordance with the recommendations discussed above, should extend from the top of compacted fill elevation of 1157.0 feet up to an elevation of 1167.75 feet. A minimum of 5.25 feet of temporary preload and surcharge fill should be constructed over that portion of the arena building area having 100 lb/ft^2 floor loading. Temporary preload and surcharge heights could be computed for areas having other than 100 or 500 lb/ft^2 floor loadings upon request.

As of the time of this report, Mortenson Construction (CM @ Risk Personnel for the Arena project) has informed Benesch that consideration is being given to preloading and surcharging *"only"* that portion of the arena floor that is being designed for 500 lb/ft^2 floor loading plus an adjacent concourse width located around and immediately adjacent to the 500 lb/ft^2 floor loading area. The remainder of the Arena floor system would be designed as a structural floor. The structural floor system and all lightly loaded footings constructed within the structural floor area would be supported by the deep foundation system. In addition, Mortenson has indicated that permanent controlled earth fill would be constructed up an elevation of only 1154.5 feet, instead

of the proposed finished floor elevation of 1157.0 feet. As a result, the 10.75 feet of "temporary" preload and surcharge recommended above would have to be increased for Mortenson's planned grading approach. Benesch would recommend that the permanent controlled/compacted earth fill be constructed up to an elevation of 1155.0 feet (to account for 0.5 feet of settlement). Additionally, the thickness of "temporary" preload and surcharge will need to be increased from 10.75 feet to 14.0 feet, to account for the additional weight of the permanent fill and concrete floor slab that will eventually be constructed above an elevation of 1154.5 feet. The 14.0 feet of temporary fill, when constructed in accordance with the recommendations discussed above, should extend from the top of permanent controlled earth fill elevation of 1155.0 feet up to an elevation of 1169.0 feet for the 500 lb/ft^2 floor loading area. The full height of temporary fill should extend beyond the extents of the proposed given floor loading area a minimum distance of 15.0 feet.

The anticipated time for the consolidation of the compressible soils to occur is approximately one month or less once the full height of permanent fill and temporary preload and surcharge fills have been placed. The settlement should be monitored during and subsequent to placement of the new fill in order for the Geotechnical Engineer to determine when the primary settlement is complete and the preload and surcharge placed above proposed floor subgrade level can be removed. If monitoring is not conducted, construction of settlement-sensitive portions of the arena structure should be delayed a minimum of 60 days after the full height of the permanent and temporary fill has been placed.

Benesch recommends that consideration be given to the installation of a minimum of six (6) settlement plates to accurately determine when settlement is essentially complete and the temporary preload and surcharge fills can be removed from the building area. The settlement monitoring system should consist of placing settlement plates within the structure areas, prior to placement of the fill, at locations determined by the Geotechnical Engineer. Consideration should be given to installing settlement-monitoring devices consisting of 3/8-inch-thick (or thicker), 4-foot-square (or round), steel plates that are installed level atop the subgrade following stripping and/or over-excavation operations. The elevations and horizontal locations of the plates should be determined to the nearest 0.01 foot and 0.1 foot, respectively, prior to burying the plates. To avoid disturbance, the soils placed immediately above each settlement plate should be buried using hand-placed and hand-compacted fill materials up to a minimum level of 1.0 foot above each plate. A thick lift of fill material should then be carefully constructed over the plate location to a level at least 2 feet above the settlement plate. Immediately following placement of the permanent and temporary fill materials, the settlement plate should be located (by survey) and a drill hole extended down to its surface so the elevation readings can be obtained on the surface of the plate. The elevation of the plate should then be monitored daily (or at a frequency specified by the Geotechnical Engineer) to determine when primary settlement is complete and the temporary preload and surcharge fill materials can be removed.

If the time required to install the permanent and temporary fill materials to full height is expected to exceed two weeks, then extendable elevation rods installed inside well-casing, could be installed atop the settlement plates to allow for the determination of the plates' surface elevations during the placement of the permanent and temporary fill materials. Extensions should be added to these elevation rods and well-casings as the height of these fills increase. These elevation rods and well casings should be well marked to minimize the chance that they become damaged by grading operations.

19. COMMON TYPES OF DEEP FOUNDATIONS

The super structure for both the parking garage and arena should be supported on a deep pile foundation system. Benesch over the past five decades has been involved with a multitude of deep foundation systems that

have been successfully installed on projects within the downtown Lincoln area and that should perform satisfactorily for the proposed arena and parking garage structures. The pile foundation types have primarily consisted of auger cast piling, concrete-filled close-end pipe piling, pre-stressed concrete piling and H-piling. The principal reason for a given pile type being selected at any given time was not only for structural reasons but also for economic cost.

Common "driven" pile types would include H-piles, prestressed concrete piles and closed-end pipe piles. H-piles are the most common driven pile type used in Lincoln. They are easy to lengthen on site, which is advantageous when the bearing strata (Dakota formation) is relatively deep and has the potential for significant relief (i.e., variation in depth to bearing) across the building sites.

Prestressed concrete piles have not been used as a deep foundation type on any known recent projects performed within the downtown Lincoln area. One of the primary reasons for prestressed concrete piling not being selected for use on projects in this area is due to the difficulty with accurately predicting the pile lengths required at varying locations across the site and the difficulty with cutting piling off to a uniform cut-off elevation within pile caps.

Closed-end pipe piles have the option of being filled with concrete after being driven to bearing to increase their structural capacity. Concrete-filled, closed-end pipe piling have not been used as a deep foundation type on any known recent projects performed within the downtown Lincoln area for the past couple decades primarily due to their higher cost.

Auger cast piling is generally the most common and economical pile type utilized on projects in the Lincoln area today. They have the advantage of being able to be installed at varying lengths as required to obtain bearing in the unweathered Dakota sandstone, which has varying relief across the arena and parking structure sites. Additionally, they have proven to be the most cost effective pile foundation system utilized on today's projects.

Based on the above discussion and discussions with DLR Group, this report provides recommendations related to design capacities and installation of driven H-piles and pipe piles, and auger cast piling.

20. DISCUSSION AND RECOMMENDATIONS FOR DRIVEN PILE FOUNDATIONS

Driven Pile Capacity

The maximum allowable section capacity of steel piling should not exceed 0.25 times the yield strength of the pile. If damage of the pile is unlikely during driving, and confirming loads tests are performed and evaluated by the Engineer, the maximum allowable section capacity may be increased to 0.33 times the yield strength of the pile. For steel pile with a yield strength of 50 ksi, this would equate to an allowable section capacity of 12.5 to 16.5 ksi.

Piles utilized on this project would develop axial compressive capacity predominantly in end-bearing in the Dakota sandstone. The allowable unit skin friction and end bearing that piles would achieve in the subsurface materials are shown in Table 12. It should be noted that the end bearing capacity would only be developed over the end section area of H-piles and closed-end pipe piles. H-piles would likely need to be driven approximately 5 to 10 feet into the Dakota sandstone to obtain bearing. Closed-end pipe piles would

likely achieve refusal with embedment between 2 and 5 feet into unweathered Dakota sandstone. The minimum depth (and associated elevation) at each boring location to the surface of the unweathered Dakota sandstone (bedrock) is presented in Table 8.

TABLE 12
SUGGESTED ALLOWABLE SOIL DESIGN VALUES FOR DRIVEN STEEL H-PILES AND PIPE PILES (FACTOR OF SAFETY = 2.0)

Elevation, ft.	Soil Type(s)	Unit Weight, pcf	Compressive Unit Skin Friction, ksf (E = Elevation, ft)	Unit End Bearing, ksf
-	New Fill	125	0.50	-
≥ 1125.0	Clayey, Silty Alluvium	115	0.05	-
1095.0 - 1125.0	Medium Dense Sandy Alluvium	130	$0.05 + 0.6\left(\frac{1125 - E}{30}\right)$	-
< 1095.0	Dense Sandy Alluvium	135	0.65	-
-	Dakota Sandstone	140	0.65	150

The total allowable design capacity for either H-pile or closed–end pipe piles could be computed if the section for each pile type is provided to Benesch.

The uplift resistance of a pile group should be determined as the lesser of:

A. 67% of the allowable **compressive** skin friction on a single pile times the number of piles in the group.
B. Two thirds of the effective weight of the group and soil contained within a block defined by the perimeter of the pile group and the embedded length of the piles.
C. One half of the effective weight of the pile group and soil contained within a block defined by the perimeter of the pile group and the embedded pile length, plus one half of the total allowable **uplift** skin friction resistance on the peripheral surface of the pile group.

Suggested design parameters for use in LPILE analyses are provide in Recommendation 22.

Down Drag

If the piles are to be driven before primary consolidation of the subsurface soils under the weight of new permanent fill materials, and temporary preload and surcharge fill materials is complete, both the consolidating soils and the soils above the consolidating soils that are in contact with the piles will impose a downward frictional force on the piles called down drag. The down drag unit skin friction on the driven steel piles is equal to the unit skin friction shown in Table 12 over that length of pile located within the compressible subsurface soil zone(s). It should be assumed that both existing soils and new fill above an elevation of 1125.0 feet will contribute to down drag. If the capacity of the pile permits, the down drag load may be supported by the pile. Otherwise, down drag loads can be eliminated by implementation of the following alternatives:

A. **Construct Fill Prior to Installing Piles**. The proposed permanent building fill, and temporary preload and surcharge fills could be constructed and allowed to settle prior to installing the piles. Settlement should be monitored during and subsequent to placement of these fill materials in order to determine when primary settlement has occurred. It is expected that primary consolidation of the compressible soils will be relatively complete within a month or less time after final placement of the permanent fill, and preload and surcharge fills have been constructed to their full heights. The settlement should be monitored with settlement plates. If the settlement is not monitored, piles should not be driven until at least 60 days after the full height of the temporary preload and surcharge fill have been installed and subsequently removed from the arena build pad.

B. **Predrilling After Construction of New Fill.** The pile locations could be predrilled after the new fill has been constructed and prior to installation of the piles to separate the compressible soils from the piles. Predrilling might be difficult at this site because of potential caving of the existing subsurface soils. Casing will probably need to be installed in the existing soils to support the sides of the holes during drilling of the holes and driving the piles. Predrilled holes would need to extend down to an elevation of 1125.0 feet (32.0 feet below finished grade). Once piles have been driven to bearing, the voids between the pile and predrilled hole should be backfilled with granular material.

C. **Predrilling Prior to Construction of the Embankments and Using CMP Pipes.** Prior to the construction of the embankments, holes could be predrilled down through the existing soils to an elevation of 1125.0 feet. Casing would likely need to be installed to keep the bore holes stable during the driving of piles. Once piles were driven to bearing, the bore hole would be backfilled with granular material. CMP pipes would then need to be placed around the driven piles and the permanent building fill soils placed and compacted up to proposed finished floor elevation.

For Alternatives B and C, if temporary preload and surcharge fill will be placed after the piles have been installed, measures should be taken to protect the tops of the piles from grading operations during placement and removal of the temporary fill materials.

Pile Points

Overdriving of H-piles when "near" refusal is experienced can damage them severely. Therefore, care must be exercised when hard driving is experienced. Ironstone was encountered within the Dakota sandstone and is a moderately hard to hard, highly-cemented concretion commonly found present in the Dakota Sandstone. It has been Benesch's experience that a driven pile will likely meet immediate refusal on the upper surface of ironstone material if it is encountered. Consequently, consideration should be given to the use of pile points to reduce the risk of H-pile damage. The insides of pipe piling should be inspected prior to the placement of concrete to confirm that they have not been damaged when driving to bearing.

Driven Pile Installation and Observation

Driven piles should be installed with fixed-lead pile-driving equipment. The use of hanging or swinging leads is not recommended, unless they are constructed so that they can be held in a fixed position during driving operations. Leads should be of sufficient length so that the use of followers will not be necessary. An air, steam or diesel-powered hammer may be used for driving piles for this project.

Efficient pile driving can be defined as driving the pile to the desired ultimate capacity at a reasonable blow count, say less than 120 blows per foot, and as close to the yield strength of the pile material as possible. To establish driving criteria for pile installation, Benesch recommends that the Wave Equation Analysis for Pile Driving (WEAP) be performed utilizing data for the actual hammer/pile combination to be used in installing the production piles. This method allows evaluation of driving stresses so that an appropriate hammer size can be selected to obtain the desired pile capacity with reasonable blow counts and without damaging the piles.

A pile driving formula should be used to establish the capacity of each pile installed in the field. It is common practice to use the Modified Engineering News formula to establish bearing. Due to the inherent inaccuracy of pile driving formulas, a minimum of three pile load tests and/or dynamic pile tests (using a pile-driving analyzer [PDA]) should also be performed for the arena and parking garage structure. One uplift pile load test should be performed if piling are designed to provide this resistance. Two of the compressive pile load tests should be performed within the arena and one compressive pile load test should be performed within the parking garage area. The Soils Engineer should select the test pile locations. The test results should be correlated with the pile driving formula and WEAP analyses results in order to establish pile driving criteria for the rest of the piles in the structure.

The Geotechnical Engineer should perform field inspection to verify that piles obtain bearing in the Dakota sandstone materials on this project. It is recommended that the Contractor should mark each pile in 1-foot increments. As the pile penetration rate decreases, the Geotechnical Engineer representative monitoring the pile installation operations should mark the pile with horizontal lines every 10 blows until such time as the pile either reaches refusal or the required set is achieved for a minimum of four (4) consecutive recordings (i.e., for 40 blows). If refusal is reached before 10 blows are achieved, driving should be immediately stopped to prevent damage to driving equipment and the pile.

Corrosion of Steel Piling

Corrosion is commonly initiated where a variation in the concentration of oxygen in the soil from one area to another creates cathode and anode areas on the pile. The reduction and oxidation reactions at the cathode and anode areas, respectively, lead to corrosion of the pile at the anode area. A less common form of corrosion is call uniform corrosion and is initiated by acidic soils with pH less than 4.0. Some factors which promote corrosion are as follows:

- Water table is below the top of pile
- The majority of the pile is above the water table
- Stratified soil conditions above the water table where layers of oxygen-rich, moist sands/silts (cathode areas) alternate with oxygen-deficient, wet to saturated clays (anode areas).
- A large cathode area and small anode area
- A relatively short distance between the cathode and anode areas
- Soils with low resistivity (less than 2000 ohm-cm)
- Soils with low pH (less than 4.0)
- Soils with low redox potential above the water table (less than 200 mV)
- Presence of man-made materials such as slag, ash and cinders

Based on the soil properties shown in Table 7, and procedures provided in AASHTO Standard R 27-01, Standard Recommended Practice for Assessment of Corrosion of Steel Piling for Non-Marine Applications, it is

Benesch's opinion that the subsurface conditions encountered at the boring locations have a low to moderate potential to cause corrosion of steel piling.

21. DISCUSSION AND RECOMMENDATIONS FOR AUGER CAST PILE FOUNDATIONS

Auger Cast Pile Capacity

Pressure-grouted auger cast piling will obtain bearing predominantly in end-bearing within the unweathered Dakota sandstone materials. It is anticipated that the bearing capacity of an auger cast pile will be limited to the section capacity of the auger cast pile. Benesch suggests calculating the allowable section capacity of a pressure-grouted auger cast pile as follows:

$$P_a = 0.33 * f'_c * A$$

f'_c = 28-Day Grout Compressive Strength
A = Pile Section Area

Auger cast piles will develop resistance to (a) downward loads through end-bearing and adhesion (skin-friction) between the pile and the soil, (b) upward loads through adhesion and the weight of the pile, and (c) lateral loads through passive soil resistance along the pile. Piles will achieve compressive capacity in the upper 5 feet of the Dakota sandstone. The minimum depth (and associated elevation) at each boring location to the surface of the unweathered Dakota sandstone (bedrock) is presented in Table 8. Benesch recommends the design parameters in Table 13 be used to for the design of pressure-grouted auger cast piles. In addition, Benesch recommends that pressure-grouted auger cast piling be installed a minimum of 5 feet into (below) the elevations presented for unweathered Dakota sandstone (bedrock) at each boring location presented in Table 8.

TABLE 13
SUGGESTED ALLOWABLE SOIL DESIGN VALUES FOR AUGER CAST PILES
(FACTOR OF SAFETY = 2.5)

Elevation, ft.	Soil Type(s)	Unit Weight, pcf	Compressive Unit Skin Friction, ksf (E = Elevation, ft)	Unit End Bearing, ksf
-	New Fill	125	0.40	-
≥ 1125.0	Clayey, Silty Alluvium	115	0.04	-
1095.0 - 1125.0	Medium Dense Sandy Alluvium	130	$0.04 + 0.56\left(\frac{1125 - E}{30}\right)$	-
< 1095.0	Dense Sandy Alluvium	135	0.60	-
-	Dakota Sandstone	140	0.60	150

With penetration a minimum of 5 feet into the unweathered Dakota sandstone bedrock materials, the minimum calculated allowable capacities for 16-inch, 18-inch and 20-inch-diameter auger cast piles would be 310, 380 and 455 kips, respectively.

Steel should extend the full length of each pile designed to provide uplift resistance. The uplift resistance of a pile group should be determined as the lesser of:

A. 67% or 83% of the allowable **compressive** skin friction in cohesionless or cohesive soil, respectively, on a single pile times the number of piles in the group.
B. Two thirds of the effective weight of the group and soil contained within a block defined by the perimeter of the pile group and the embedded length of the piles.
C. One half of the effective weight of the pile group and soil contained within a block defined by the perimeter of the pile group and the embedded pile length, plus one half of the total allowable **uplift** skin friction resistance (as determined above in Part A) on the peripheral surface of the pile group.

Suggested design parameters for use in LPILE analyses are provide in Recommendation 22.

Down Drag

If the pressure-grouted auger cast piles are to be installed before primary consolidation of the subsurface soils under the weight of new fill materials is complete, both the consolidating soils and the soils above the consolidating soils that are in contact with the piles will impose a downward frictional force on the piles called down drag. The down drag unit skin friction on the piles is equal to the unit skin friction shown in Table 13. It should be assumed that both existing soils and new fill above an elevation of 1125.0 feet will contribute to down drag. If the capacity of the pile permits, the down drag load may be supported by the pile. In this case, the reduction in "allowable" pile capacity for supporting loads would be 7, 8 and 9 kips for pile diameters of 16, 18 and 20 inches, respectively.

Down drag loads can be eliminated by constructing the new permanent fill, and the temporary preload and surcharge fills prior to installation of the piles. The proposed fill would be constructed and allowed to settle prior to installing the piles. Settlement should be monitored during and subsequent to placement of the new permanent and temporary fills in order to determine when primary settlement has occurred, and the temporary fill can be removed prior to installation of the auger cast piling. It is expected that primary consolidation of the compressible soils will be relatively complete within a month or less after construction of the permanent and temporary fills to their full height. The settlement should be monitored with settlement plates. If the settlement is not monitored, auger cast piles should not be installed until the permanent and temporary fills have been placed to full height for 60 days and then the temporary fill is removed.

Minimum Pile Spacing

Auger cast piles should be installed at a minimum center-to-center spacing of three (3) pile diameters to avoid a reduction in the individual compressive capacity due to group effects. If piles are installed closer than three diameters, the potential reduction in capacity per pile depends on the size, spacing and length of the piles. Benesch suggests that installation of adjacent piles, having a center-to-center spacing of less than six (6) pile diameters, be delayed until the grout in the adjacent initial pile(s) has set.

Pile Load Testing

Three compressive pile load tests should be performed within the arena and parking garage sites. One uplift pile load test should be performed if the auger cast piling are designed to provide uplift resistance. The safety factor used for pile design can be reduced from 2.5 to 2.0 if confirmed by the pile load testing performed. Additionally, the pile load testing should be utilized to verify a design that has utilized a compressive stress that exceeds 0.25 times f'_c. The static load test should be performed in accordance with the "Standard Loading Procedure" described in ASTM D 1143, Standard Test Method for Pile Under Static Axial Compression Load. An optional loading procedure that would provide valuable test data is "Loading in Excess of Standard Load". The test and reaction piles utilized during the load testing procedures should not be used to support the structures. The final location of the load test(s) should be subject to the approval of the Geotechnical Engineer. The load test(s) should be performed under the supervision of the Geotechnical Engineer to maintain continuity between the subsurface exploration, analyses and installation of the piles.

Inspection of Auger Cast Piles

Continuous observation by the Geotechnical Engineer or his representative should be performed during installation of the auger cast piles. A reduced pile capacity would result if the piles are not properly constructed.

22. LPILE AND BATTERED PILE RECOMMENDATIONS

The recommended material properties for input into LPILE are shown in Table 14.

TABLE 14
SUGGESTED SOIL DESIGN VALUES FOR LPILE ANALYSES

Elevation, ft	Soil Description	LPILE Soil Type	Unit Weight, lbs/in^3	Cohesion, lb/in^2	Soil Strain, ε_{50}	Friction Angle, deg	p-y Modulus "k", lb/in^3
-	New Fill	Stiff Clay w/o Free Water	125	12.5	0.005	-	-
≥ 1125.0	Clayey, Silty Alluvium	Soft Clay	115	5.0	0.015	-	-
1095.0 - 1125.0	Medium Dense Sandy Alluvium	Sand	130	-	-	33	60
< 1095.0	Dense Sandy Alluvium	Sand	135	-	-	38	125
-	Dakota Sandstone	Sand	140	-	-	41	125

It should be noted that the parameters in Table 14 do not apply for driven piles that have been predrilled to reduce down drag as described for alternatives B and C in Recommendation 19. If predrilled piles will be used on this project, Benesch can provide applicable LPILE inputs for the predrilled portion of the piles upon request.

At the time of this report, reactions at the pile heads were not known. Once these values are know, Benesch could provide the results of LPILE analyses and recommendations for allowable capacity of battered piles in the addendum report.

23. GRADING OBSERVATION

Observation and frequent testing by the Geotechnical Engineering Firm during compaction of fill and backfill are necessary to verify proper moisture content and degree of compaction. A professional opinion should be obtained from the Geotechnical Engineer that the site has been properly prepared, that all lightly loaded spread footings will be seated on suitable foundation materials, and that all fill, backfill, and subgrade materials conform to the moisture content and compaction recommendations presented above. If these testing and observation services are not performed, the above recommendations might be invalid. As the Geotechnical Engineer for this project, Benesch has interpreted the results of the subsurface exploration and laboratory tests to arrive at the recommendations presented in this report. Consequently, Benesch is in the best position to relate actual observed conditions to those assumed for this report and to provide revised recommendations if differences are found during grading operations and construction of the foundation for the referenced project.

24. SUBGRADE OBSERVATION

The floor subgrade, pavement subgrade and foundation materials should be observed by the Geotechnical Engineer immediately prior to placement of the concrete or paving components. Severe changes in the condition of these materials can occur after initial preparation as the result of rain, drying, freezing and construction activities. Any subgrade or foundation material that becomes disturbed, desiccated, or does not conform to the moisture content and compaction recommendations previously presented should either be removed and replaced or reworked to meet these recommendations.

25. APPLICABILITY OF RECOMMENDATIONS

The recommendations presented in this report are based in part upon Benesch's analyses of the data from the Dutch friction-cone soundings and soil borings. The penetration diagrams, boring logs, and related information depict subsurface conditions only at the specific sounding and boring locations and at the time of the subsurface exploration. Soil conditions may differ between the soundings and exploratory borings and might change with the passage of time. The nature and extent of any variations between the sounding and boring locations or of any changes in soil conditions (e.g., drying of soil) might not become evident until grading operations and construction of the foundation for the referenced project have begun. If variations and changes in the soil conditions then appear, it will be necessary to re-evaluate the recommendations stated in this report.

6.0 CONCLUSIONS

Benesch concludes, on the basis of the findings of the subsurface exploration at the project site and the evaluation of the engineering properties of samples of the foundation materials, that the proposed arena and parking garage can be safely supported by a deep foundation system (either driven H-pile or pipe pile, or pressure-grouted auger cast pile) seated on Dakota sandstone.

Settlement of the floor slabs will occur under the weight of the proposed permanent fill and design floor loads. The floor area should preloaded and surcharged to facilitate consolidation of the compressible subsurface soils prior to installation of the pile foundation system or floor slab construction. An alternative to preloading and surcharging of the floor slab areas would be to construct a structural floor system totally supported by the deep seated pile foundation system. Satisfactory performance of the structures is to be expected if the foregoing recommendations are carried out.

The garage design has not been finalized as of the issuance of this geotechnical engineering report. As such, the amount of fill required to raise the site to lower floor subgrade level within the garage area is unknown. The need for preloading and surcharging, or a structural floor within the parking garage will be assessed when the garage design has been further established. Those findings and recommendations will be presented in a subsequent geotechnical engineering report that will serve as an addendum to this report.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices for exclusive use by the City of Lincoln for specific application to the proposed arena and parking garage. The recommendations of this report are not valid for any other purpose.

Benesch should be contacted if any questions arise concerning this report or if changes in the nature, design or location of these structures are planned. If any such changes are made, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed by Benesch and the conclusions of this report are modified or verified in writing. This report shall not be reproduced, except in full, without the written approval of Alfred Benesch & Company.

Prepared By:

PROFESSIONAL CIVIL ENGINEER
JASON E. HERR
E-12440
STATE OF NEBRASKA

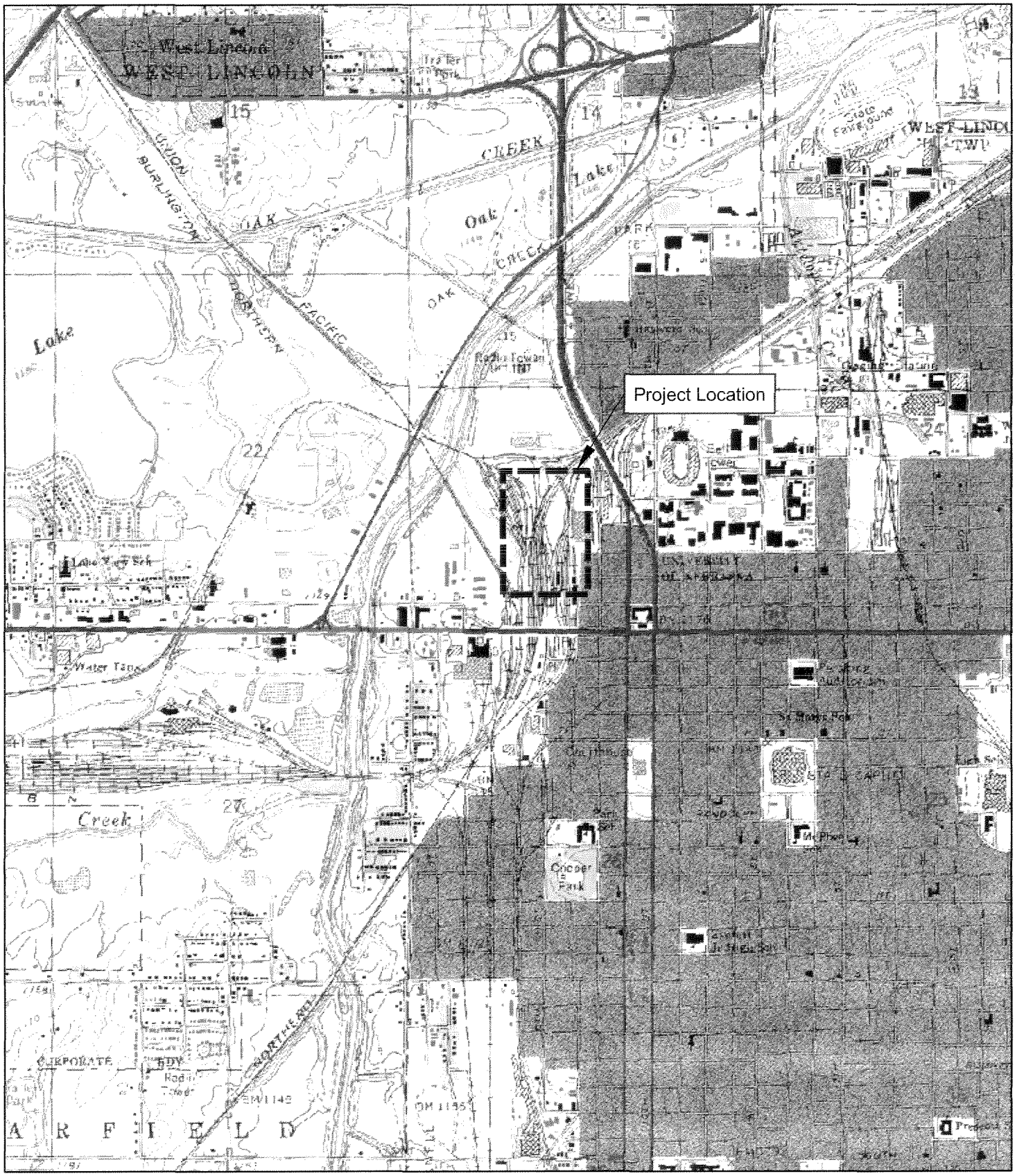
12-27-10

Jason E. Herr, P.E.

Reviewed By:

Gary E. Proskovec, P.E.

APPENDIX A. VICINITY MAP AND BORING LOCATION PLAN



NRCS Quad Map

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N
W E
S

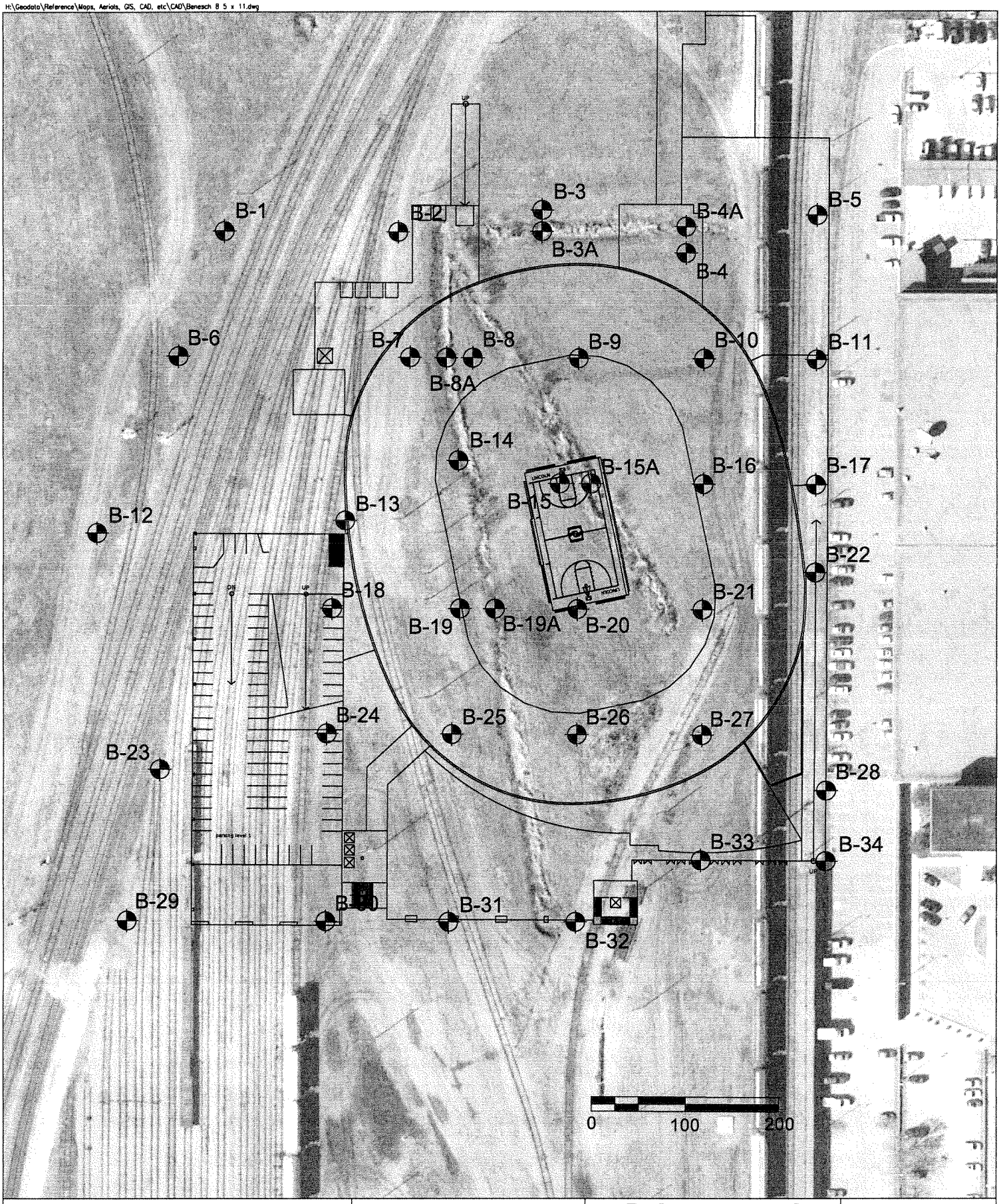
0 500 1,000 2,000
Feet

1 inch = 2,000 feet

Figure 1
Site Location Map

West Haymarket Arena
Lincoln, Nebraska

H:\Geodata\Reference\Maps, Aerials, GIS, CAD, etc\CAD\Benesch 8 5 x 11.dwg



WEST HAYMARKET ARENA
LINCOLN, NEBRASKA

FIGURE A-2

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PROJECT ----
DATE Dec. 2010
SHEET NO. 1/1

APPENDIX B. DUTCH FRICTION-CONE PENETRATION DIAGRAMS

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-1**
LOCATION: **B-1**
SURFACE ELEVATION: **1150.9 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

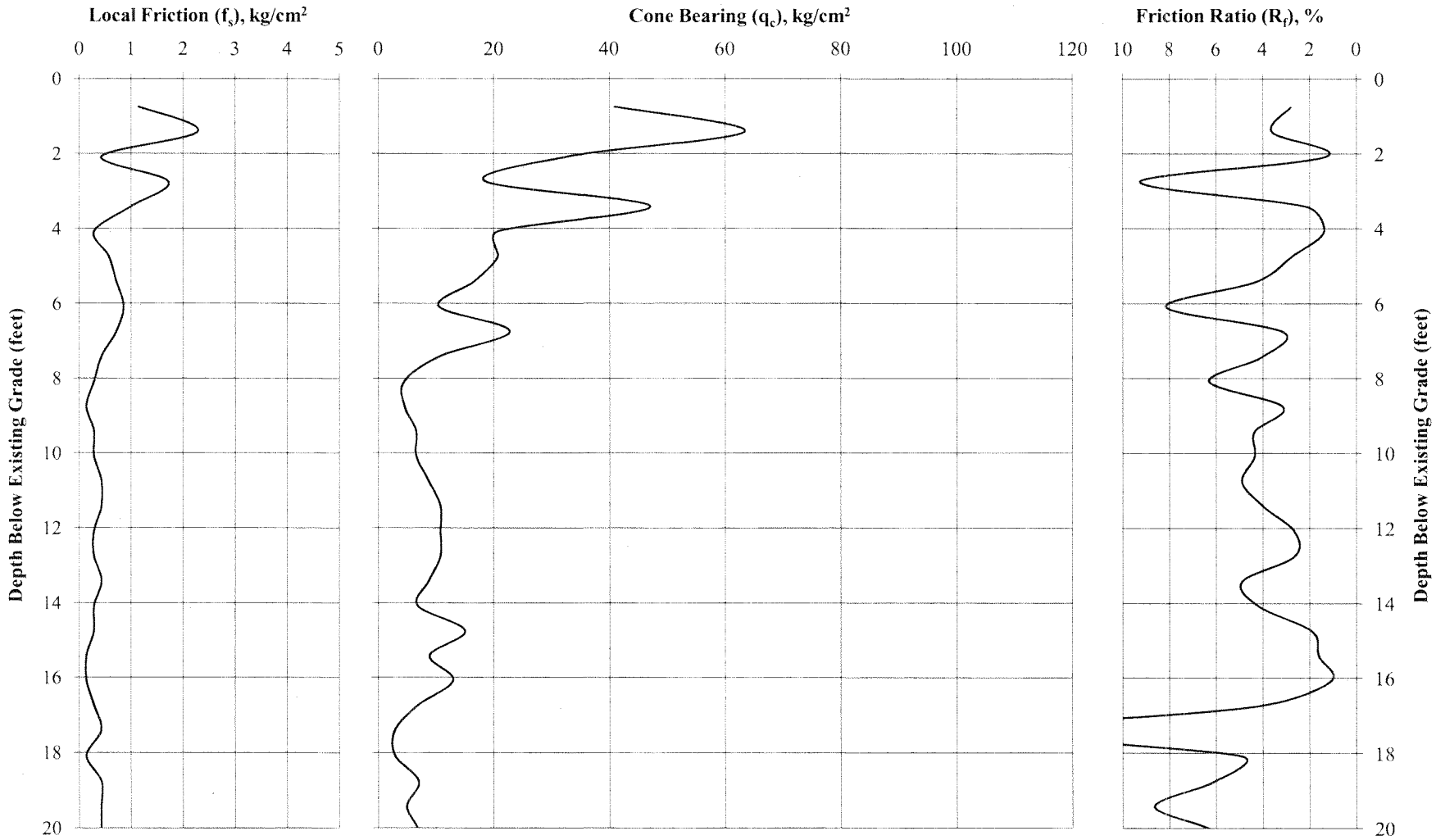

Figure B-1a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-1**
LOCATION: **B-1**
SURFACE ELEVATION: **1150.9 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

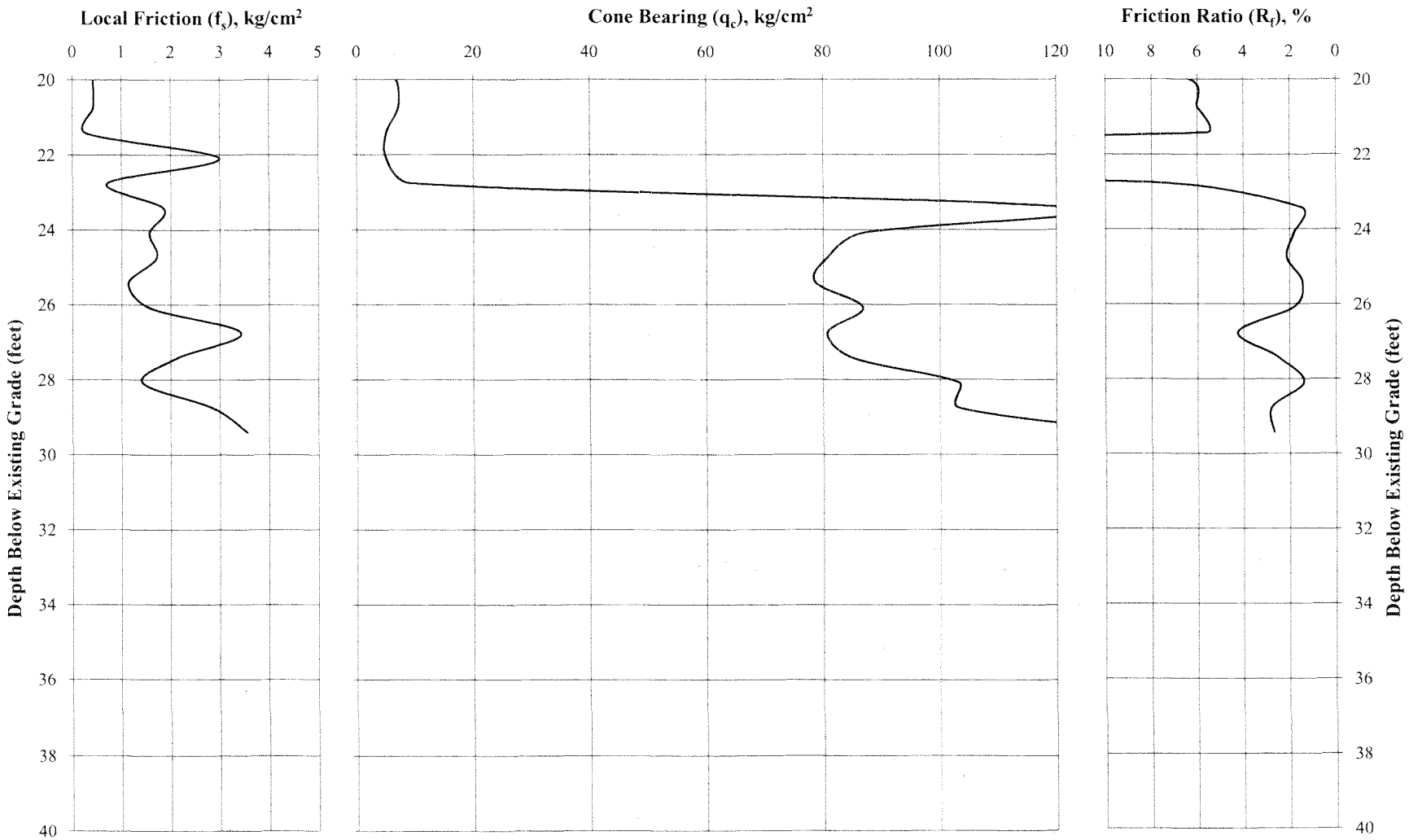

Figure B-1b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-2**
LOCATION: **B-2**
SURFACE ELEVATION: **1149.8 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

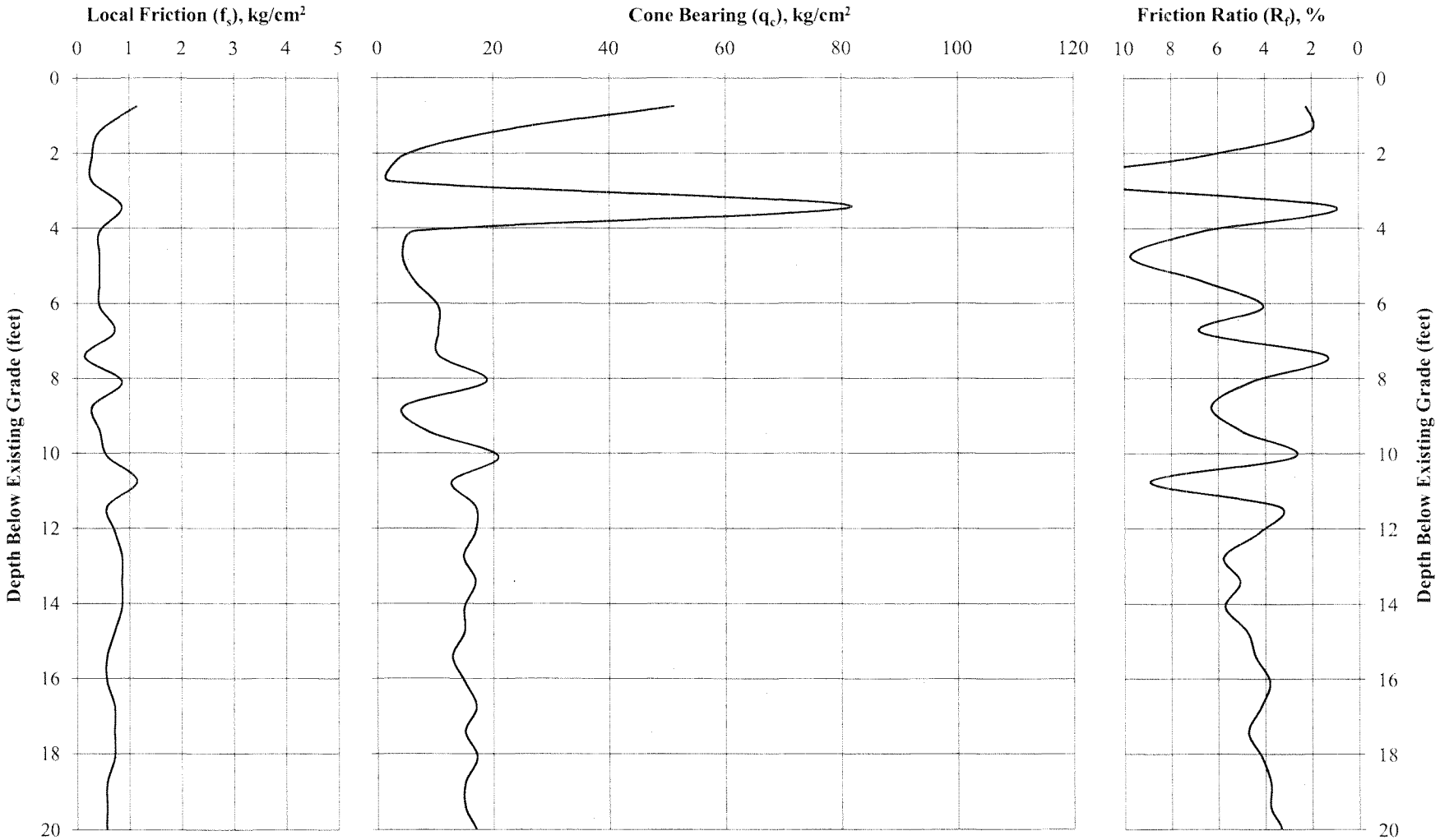

Figure B-2a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-2**
LOCATION: **B-2**
SURFACE ELEVATION: **1149.8 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

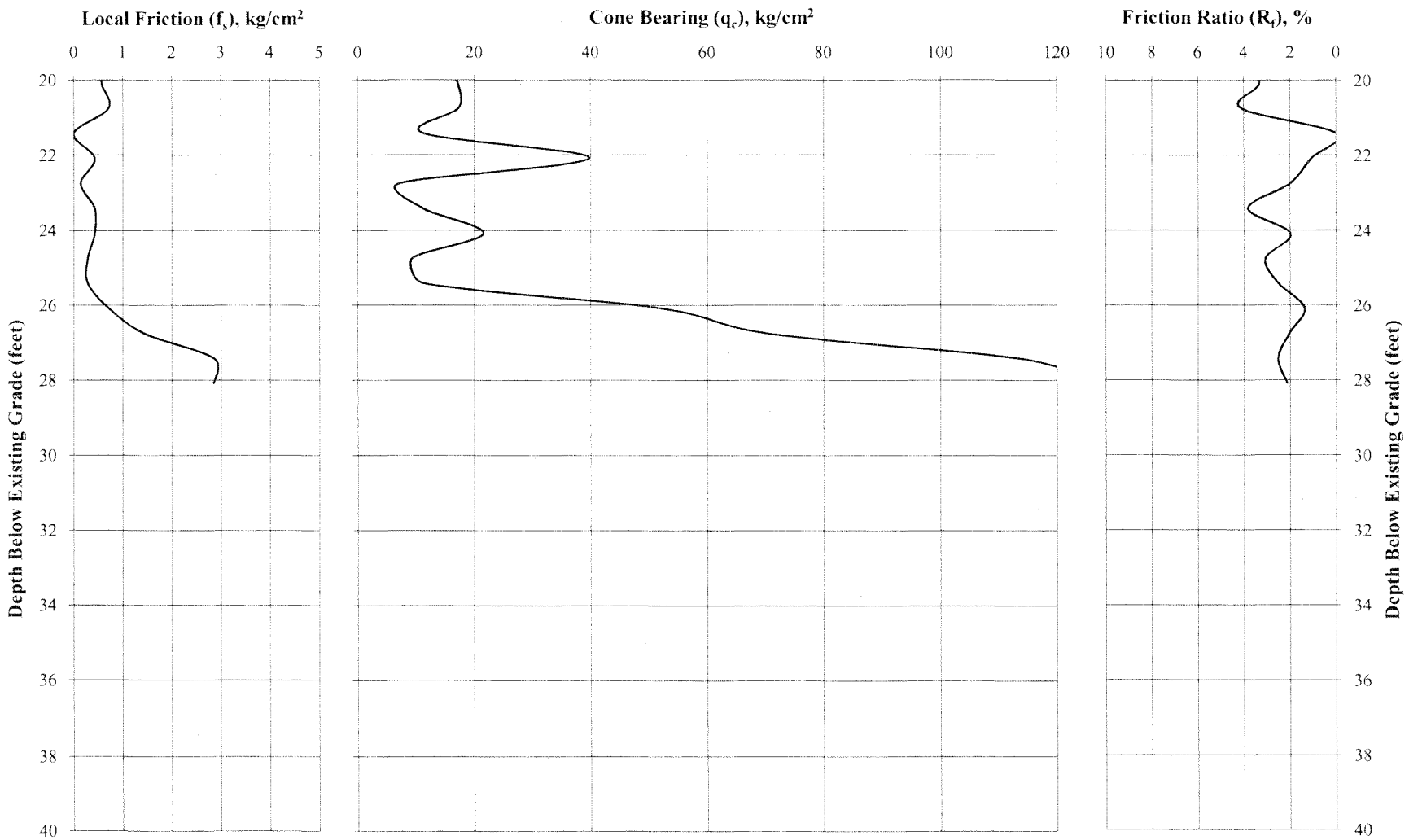

Figure B-2b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-3**
LOCATION: **B-3**
SURFACE ELEVATION: **1145.6 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

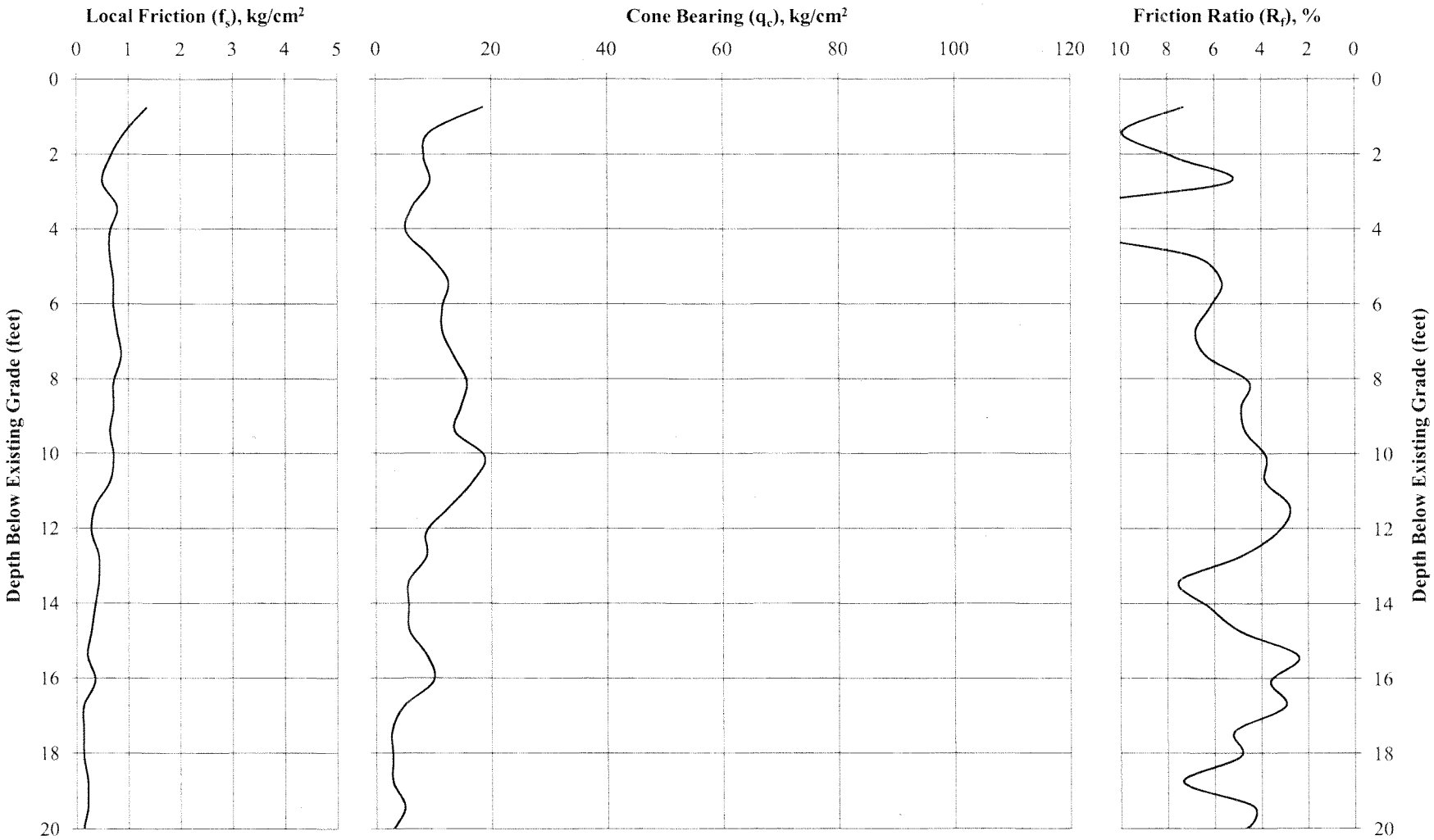

Figure B-2a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-3**
LOCATION: **B-3**
SURFACE ELEVATION: **1145.6 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

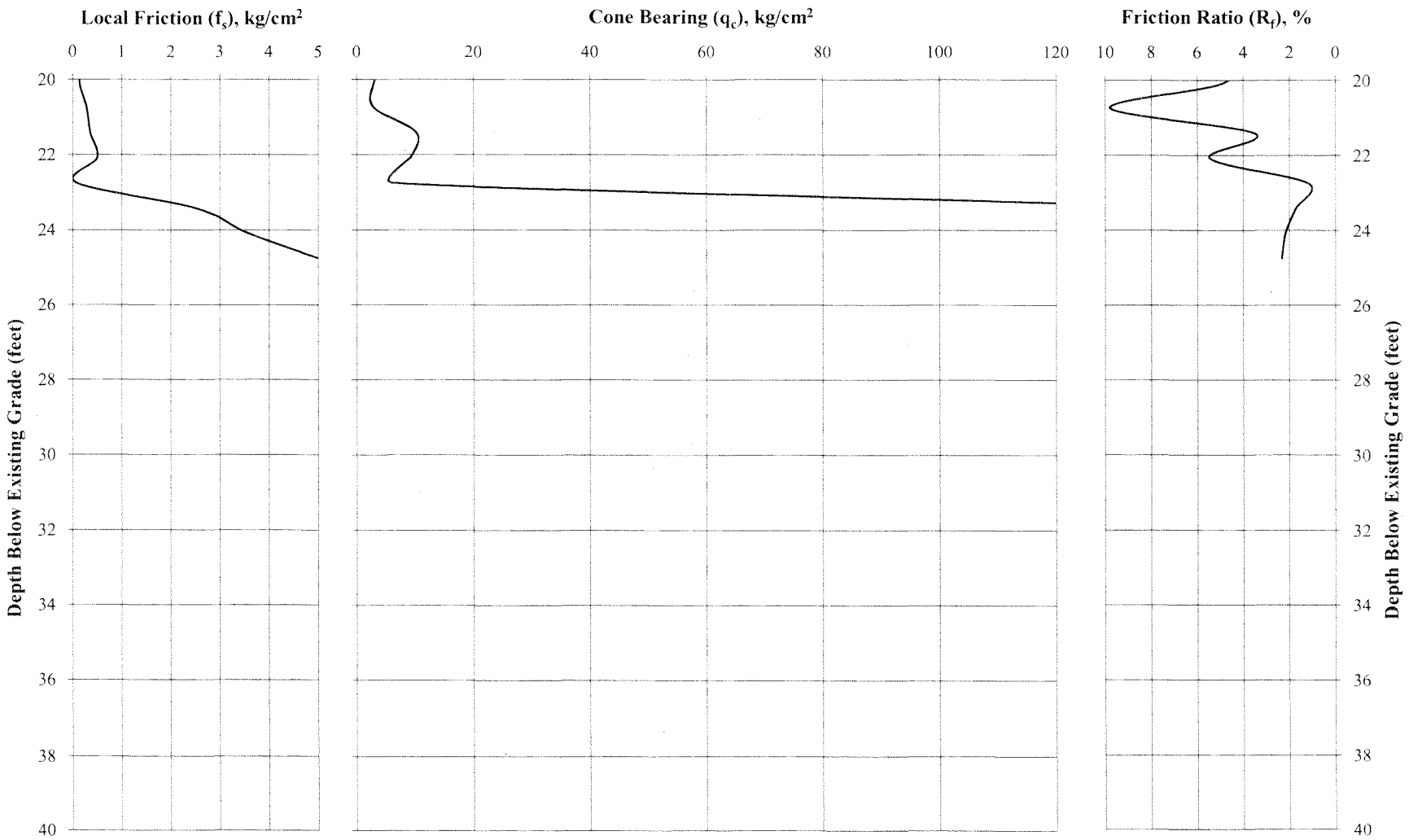

Figure B-2b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-4**
LOCATION: **B-4**
SURFACE ELEVATION: **1145.3 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

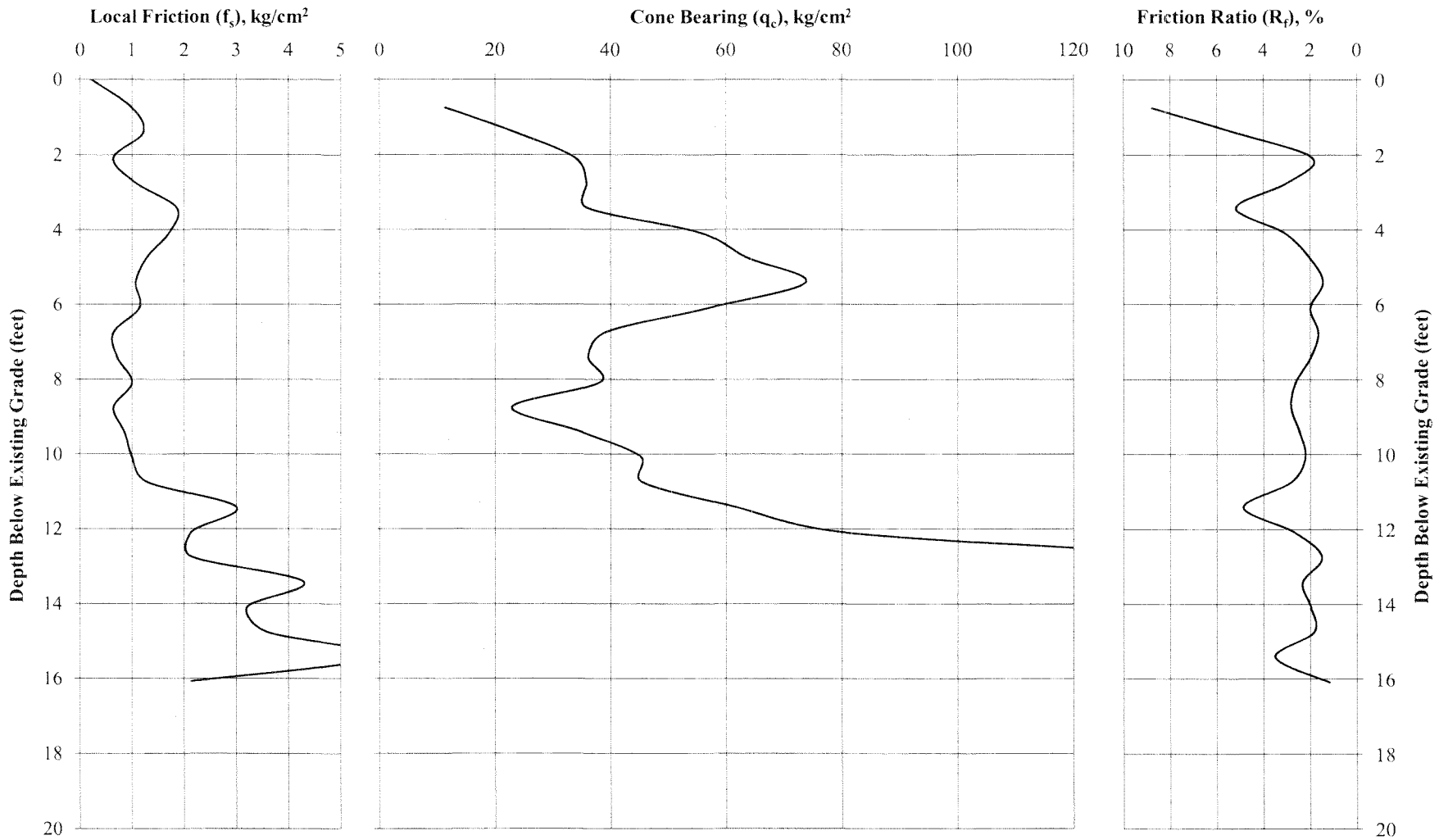

Figure B-4a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-5**
LOCATION: **B-5**
SURFACE ELEVATION: **1150.9 feet**

DATE: **October 11, 2010**
TESTED BY: **BB**
RECORDED BY: **LDI**

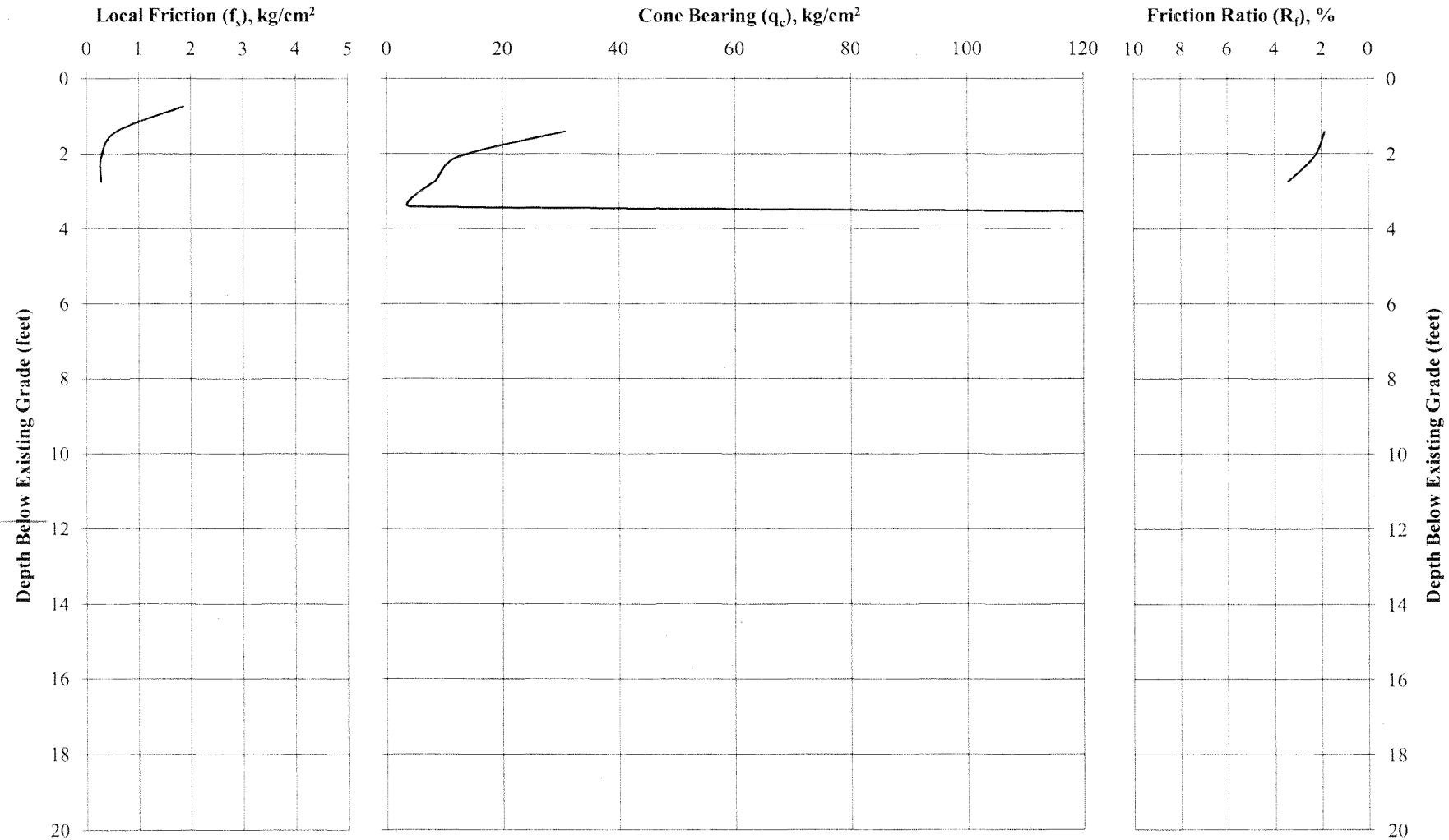

Figure B-5a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-6**
LOCATION: **B-6**
SURFACE ELEVATION: **1151.1 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

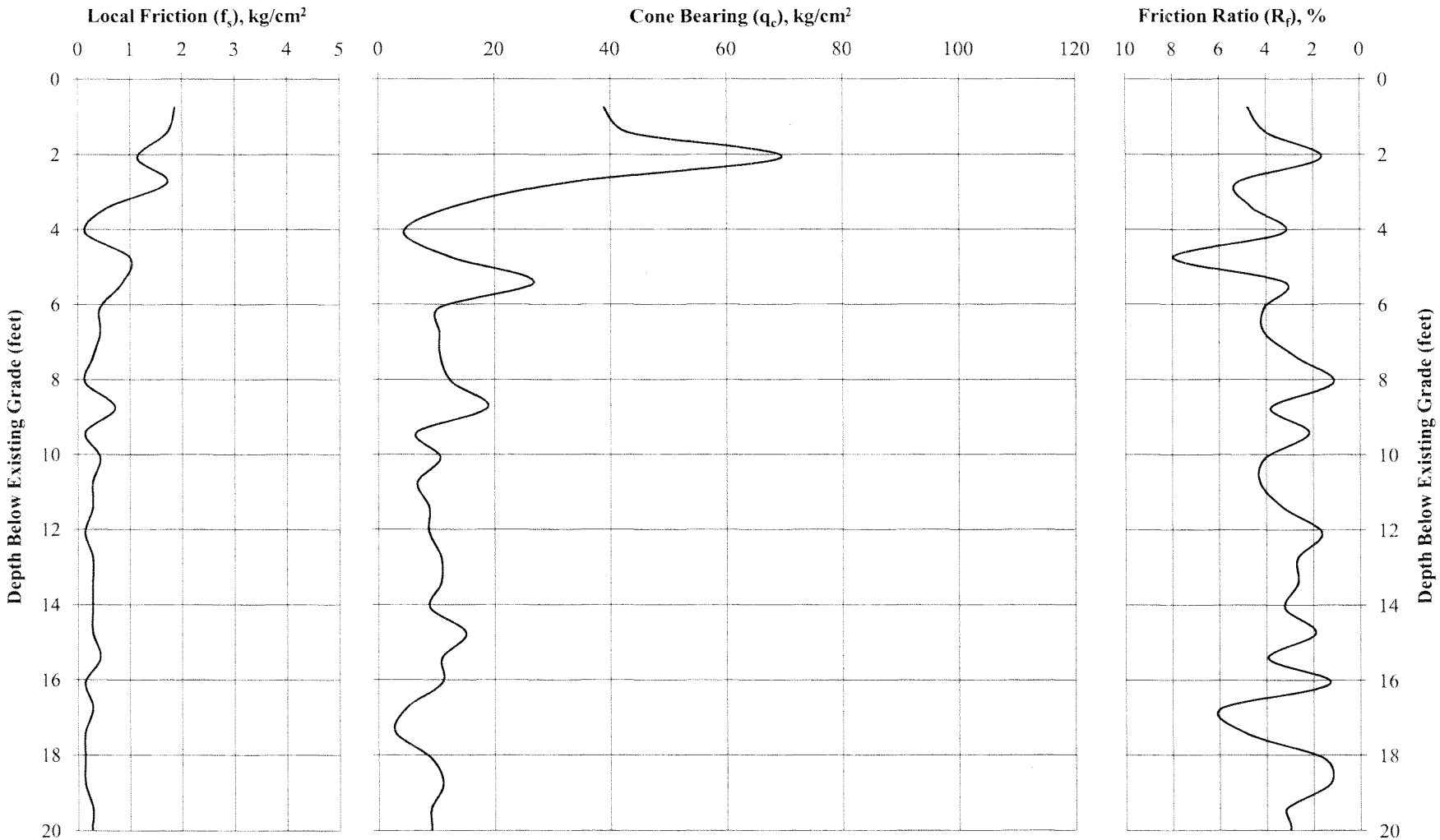

Figure B-6a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-6**
LOCATION: **B-6**
SURFACE ELEVATION: **1151.1 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

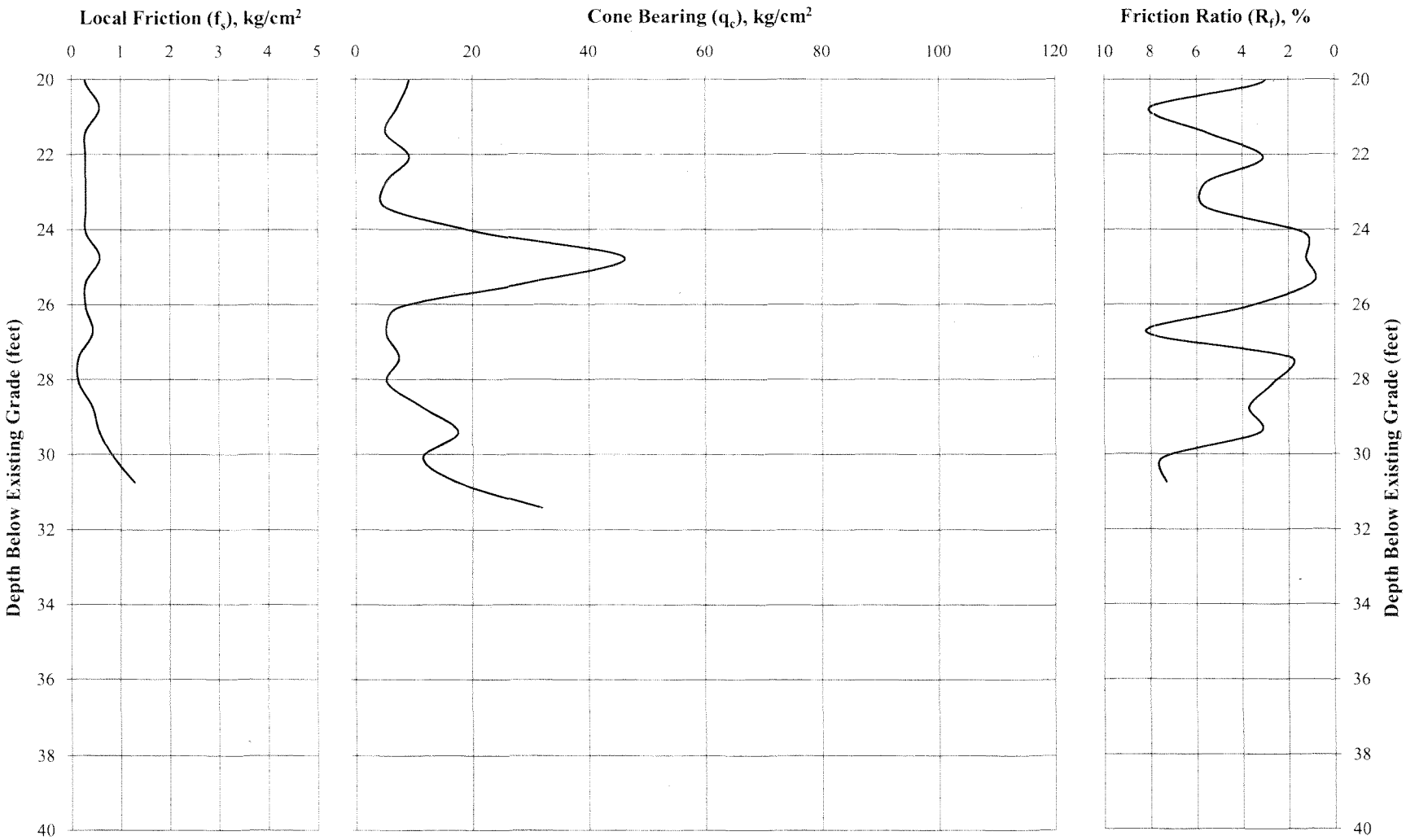

Figure B-6b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-7**
LOCATION: **B-7**
SURFACE ELEVATION: **1149.5 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

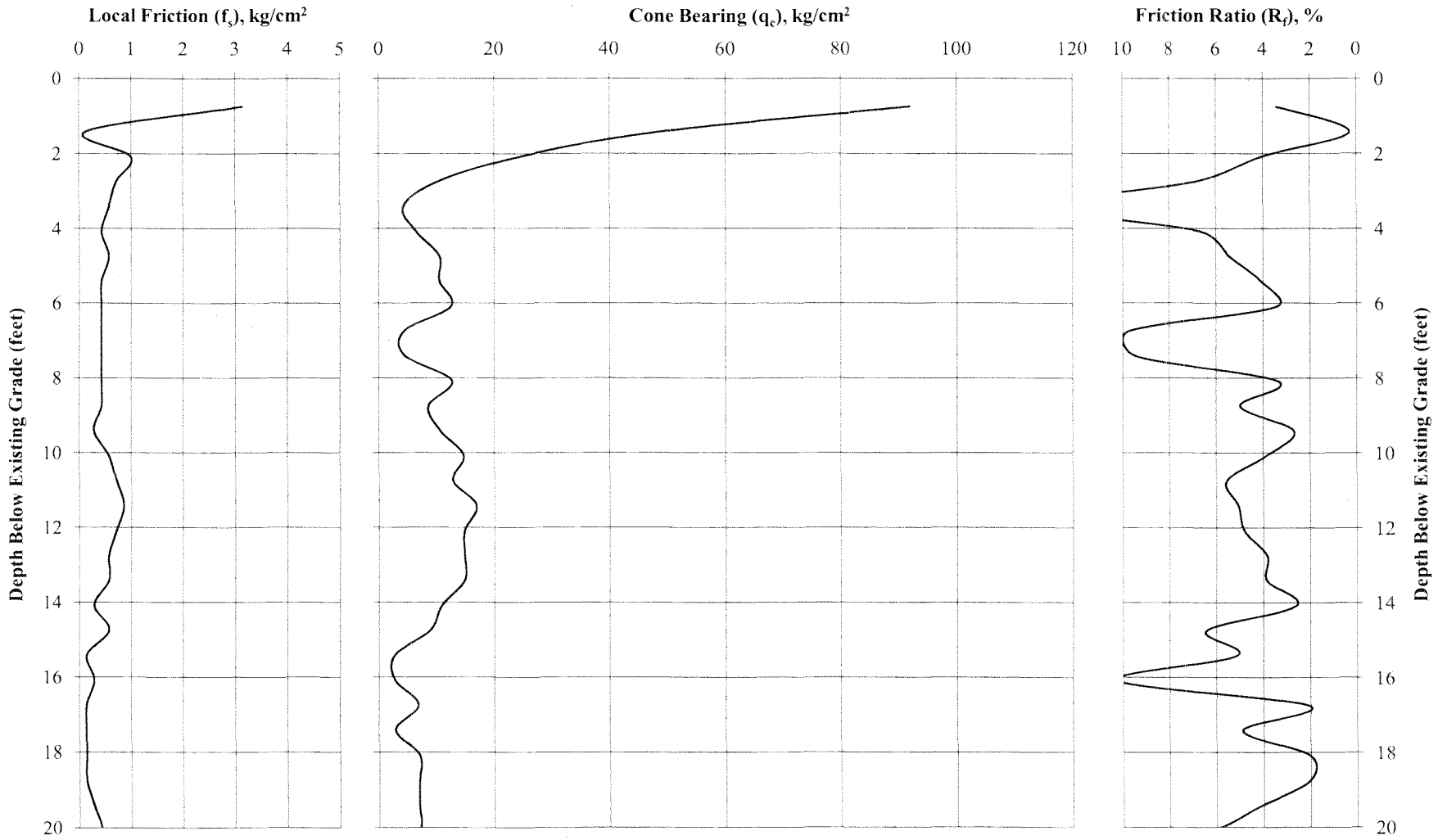

Figure B-7a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-7**
LOCATION: **B-7**
SURFACE ELEVATION: **1149.5 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

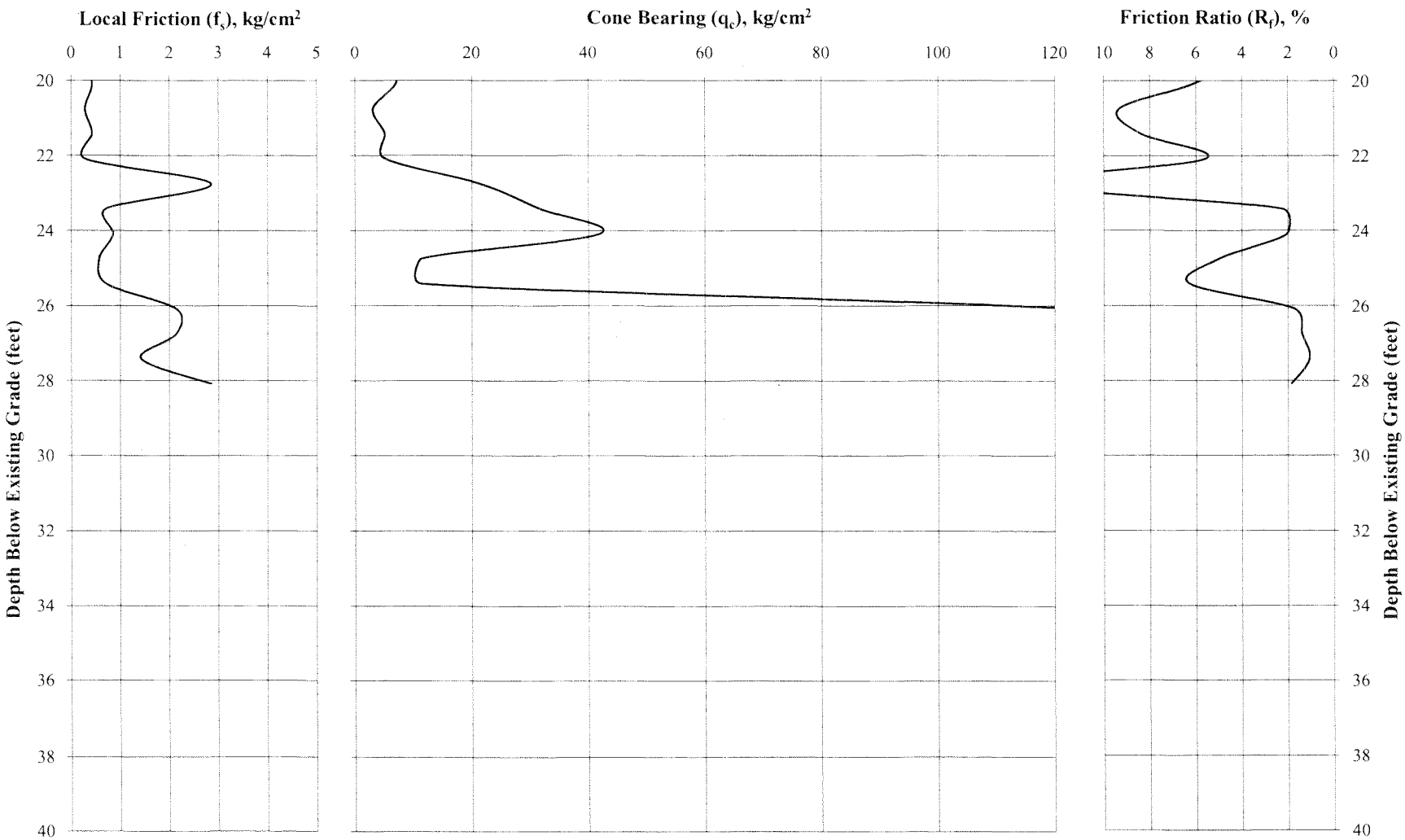

Figure B-7b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-8**
LOCATION: **B-8**
SURFACE ELEVATION: **1145.3 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

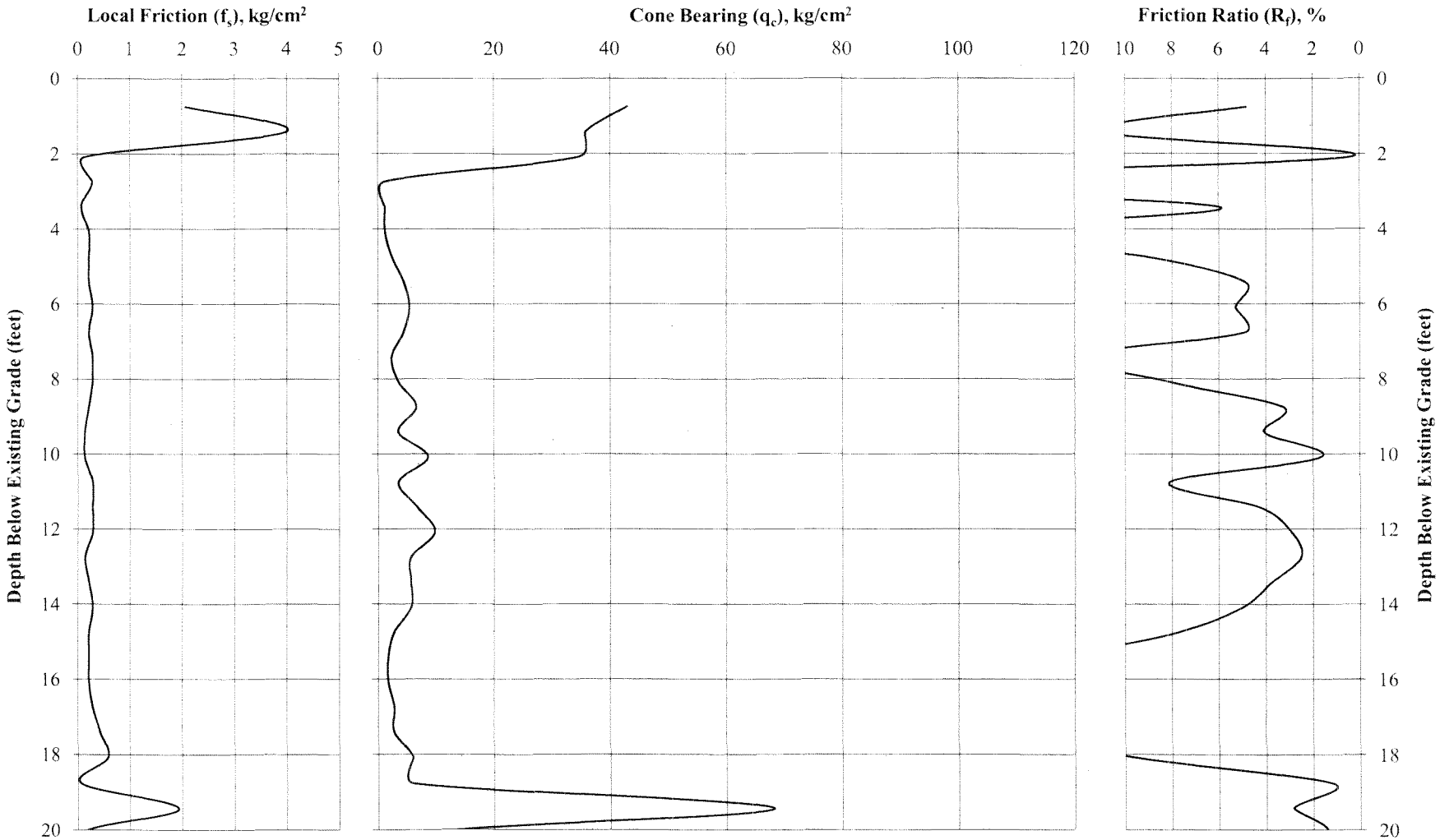

Figure B-8a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-8**
LOCATION: **B-8**
SURFACE ELEVATION: **1145.3 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

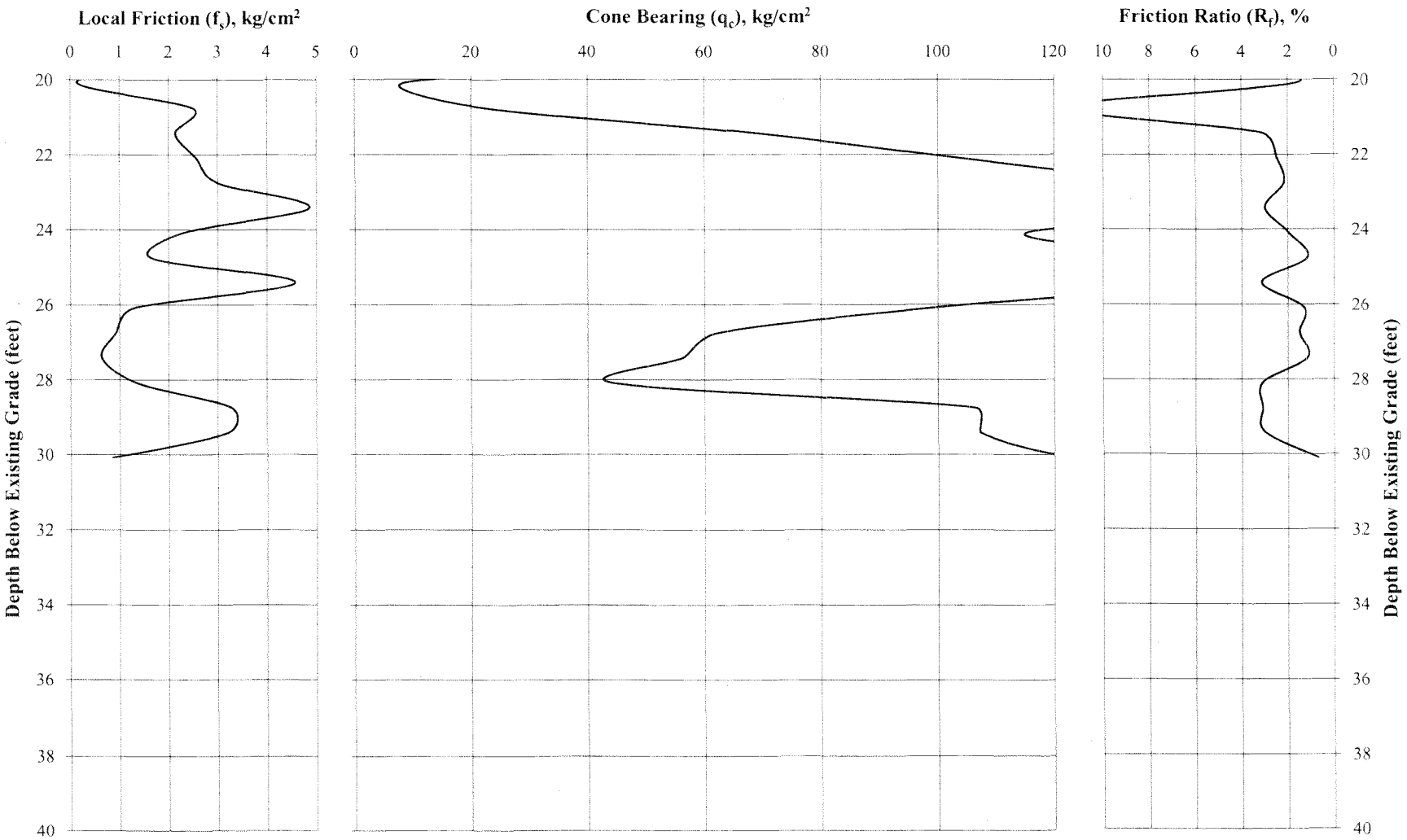

Figure B-8b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-9**
LOCATION: **B-9**
SURFACE ELEVATION: **1144.6 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

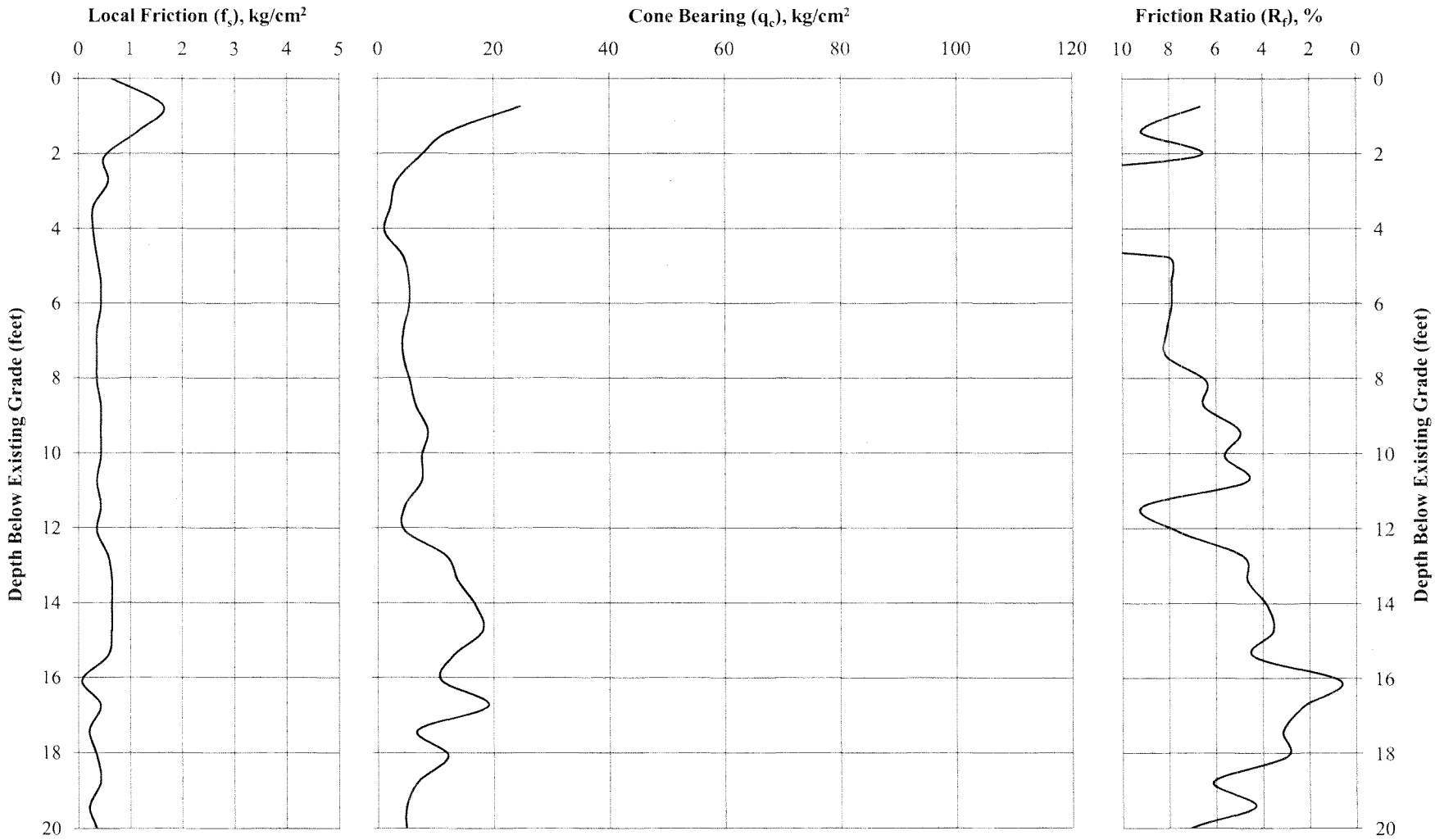

Figure B-9a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-9**
LOCATION: **B-9**
SURFACE ELEVATION: **1144.6 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

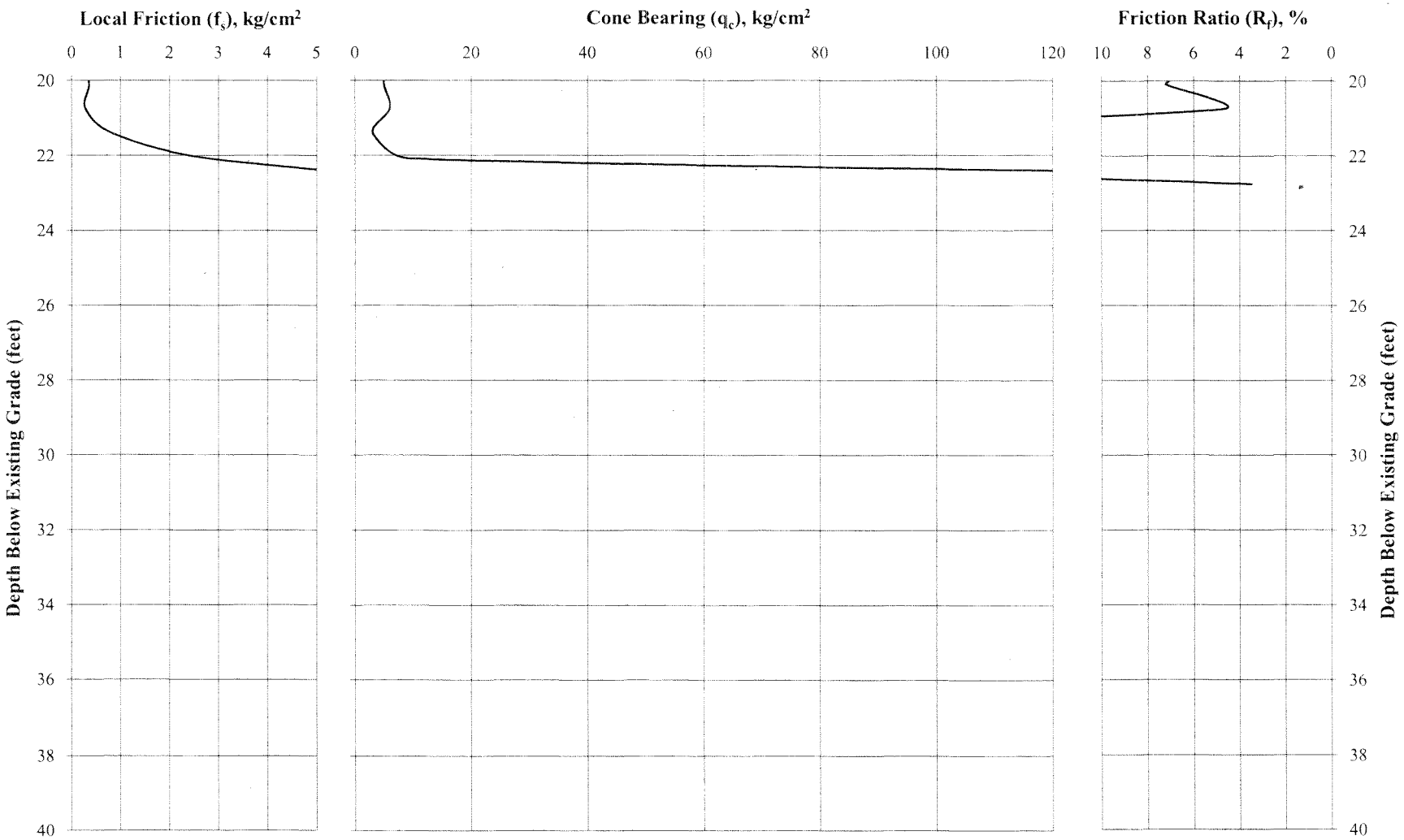

Figure B-9b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-10**
LOCATION: **B-10**
SURFACE ELEVATION: **1146.5 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

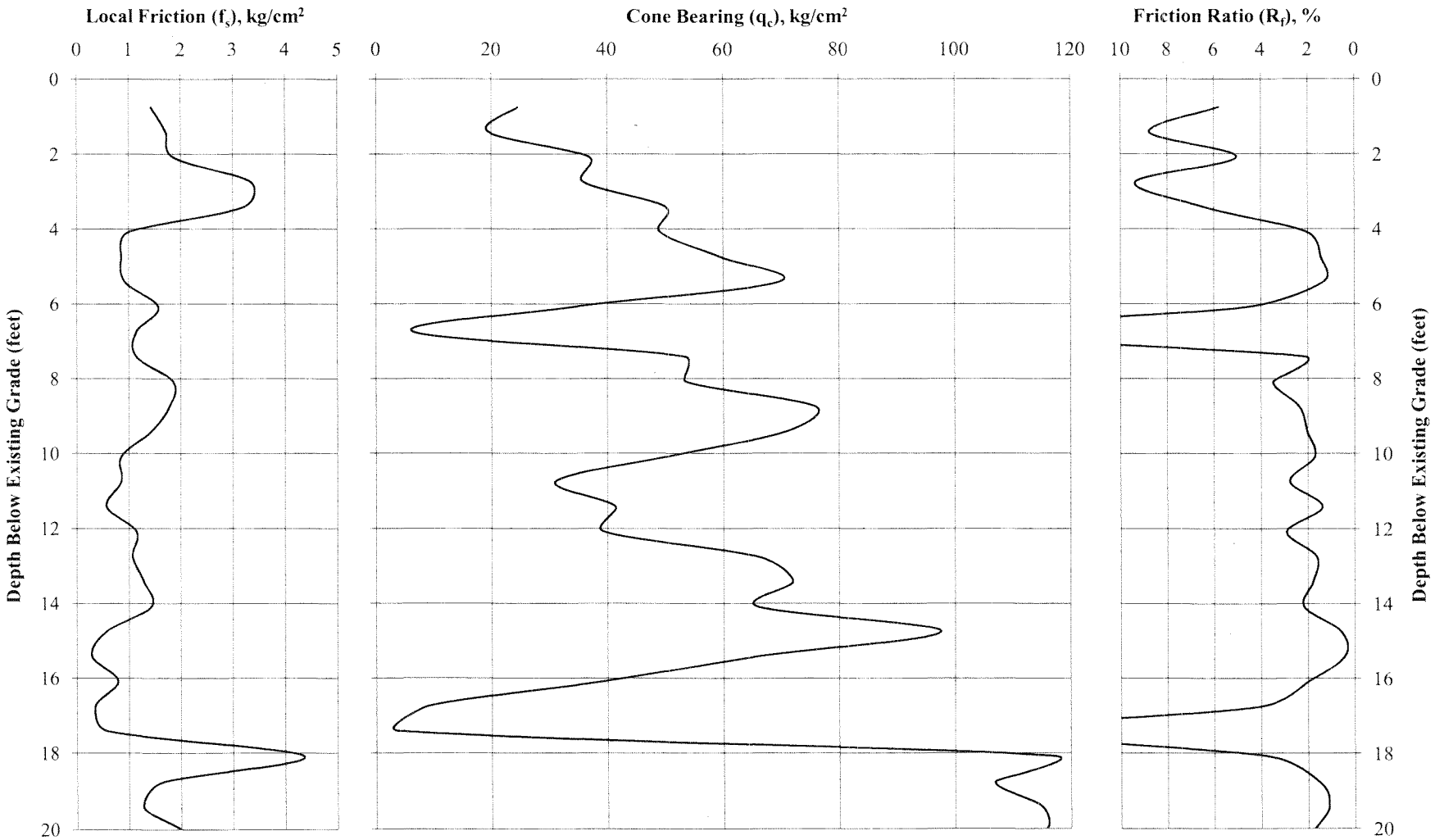

Figure B-10a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-10**
LOCATION: **B-10**
SURFACE ELEVATION: **1146.5 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

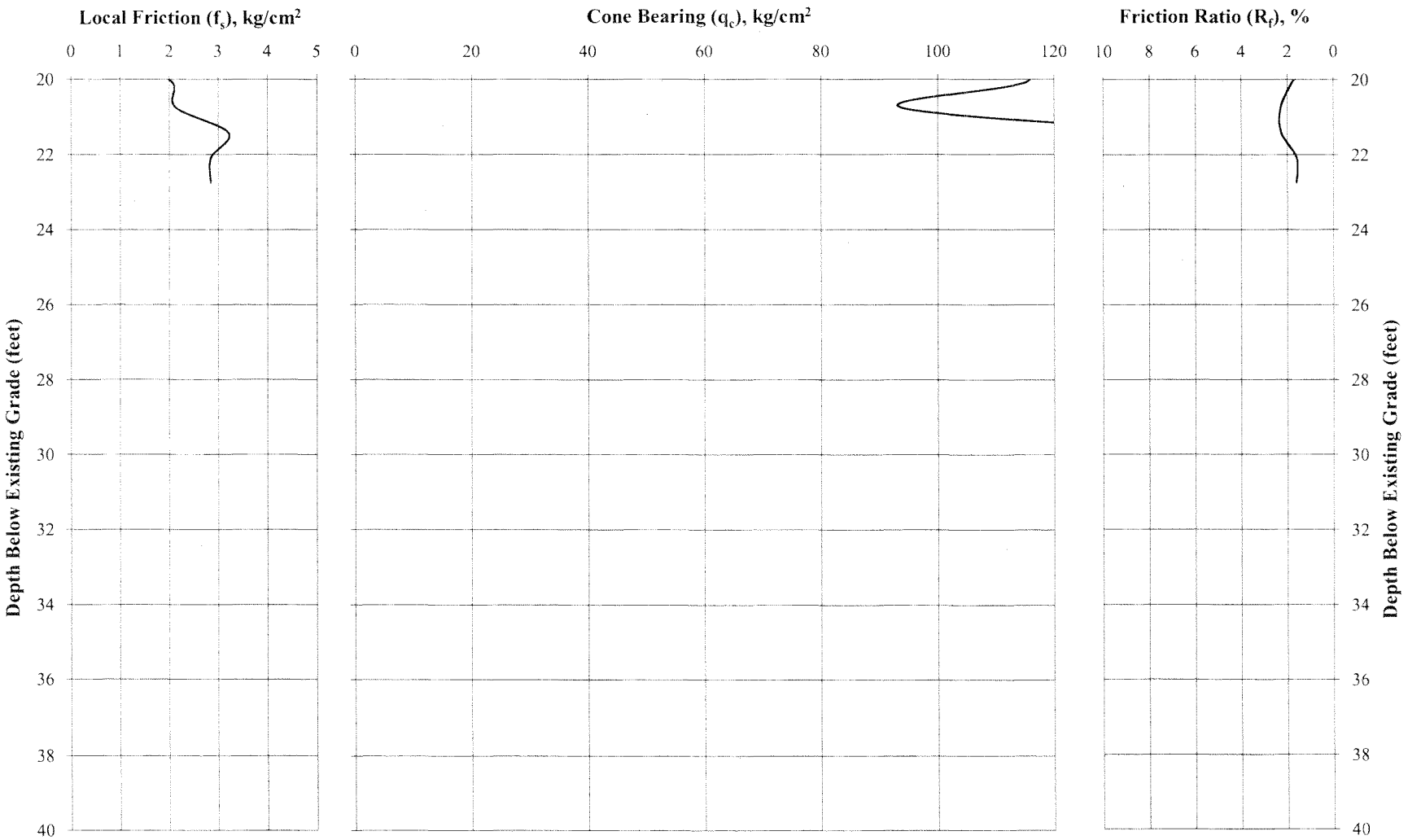

Figure B-10b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-11**
LOCATION: **B-11**
SURFACE ELEVATION: **1151.1 feet**

DATE: **October 11, 2010**
TESTED BY: **BB**
RECORDED BY: **LDI**

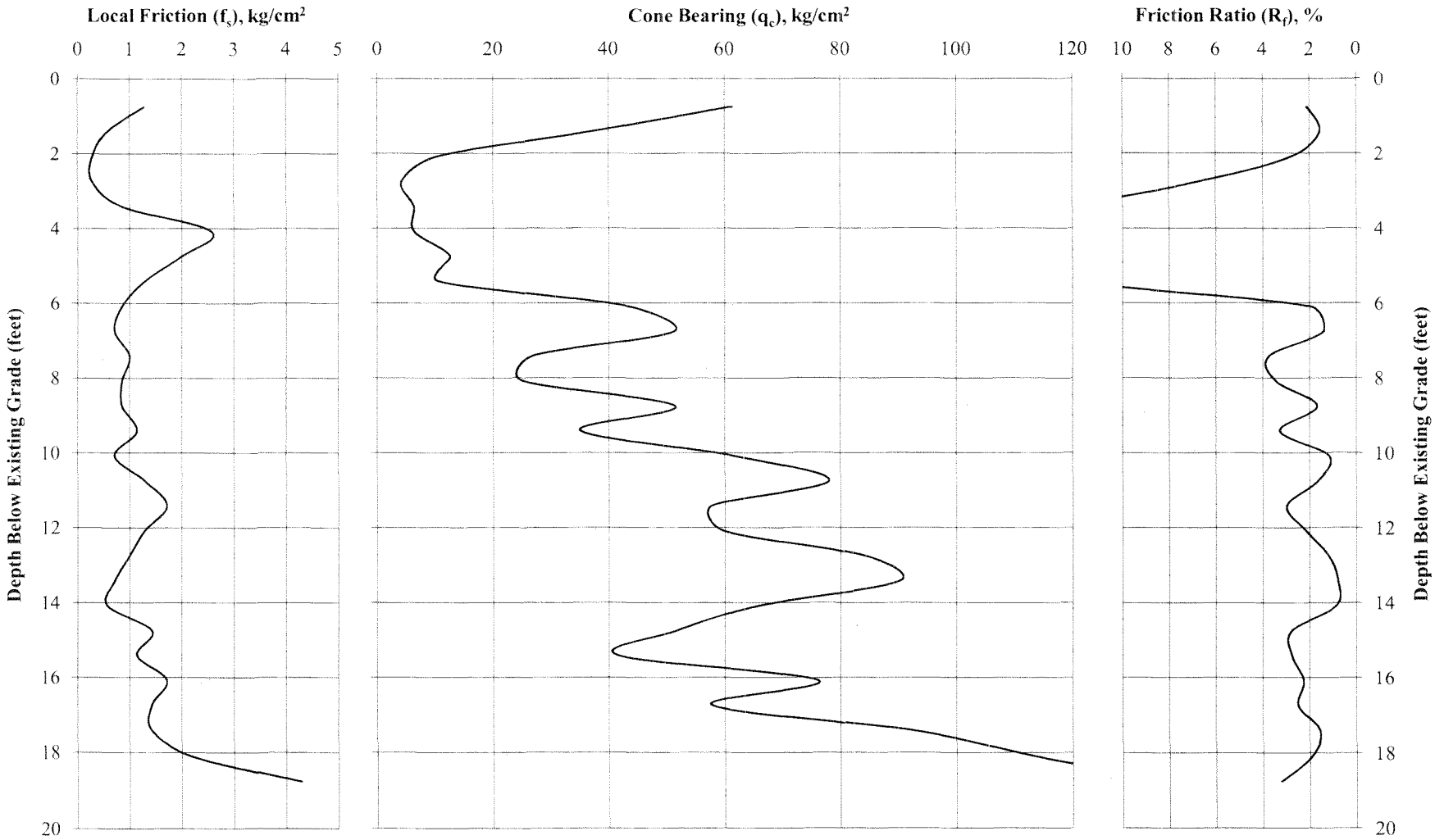

Figure B-11a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-12**
LOCATION: **B-12**
SURFACE ELEVATION: **1148.9 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

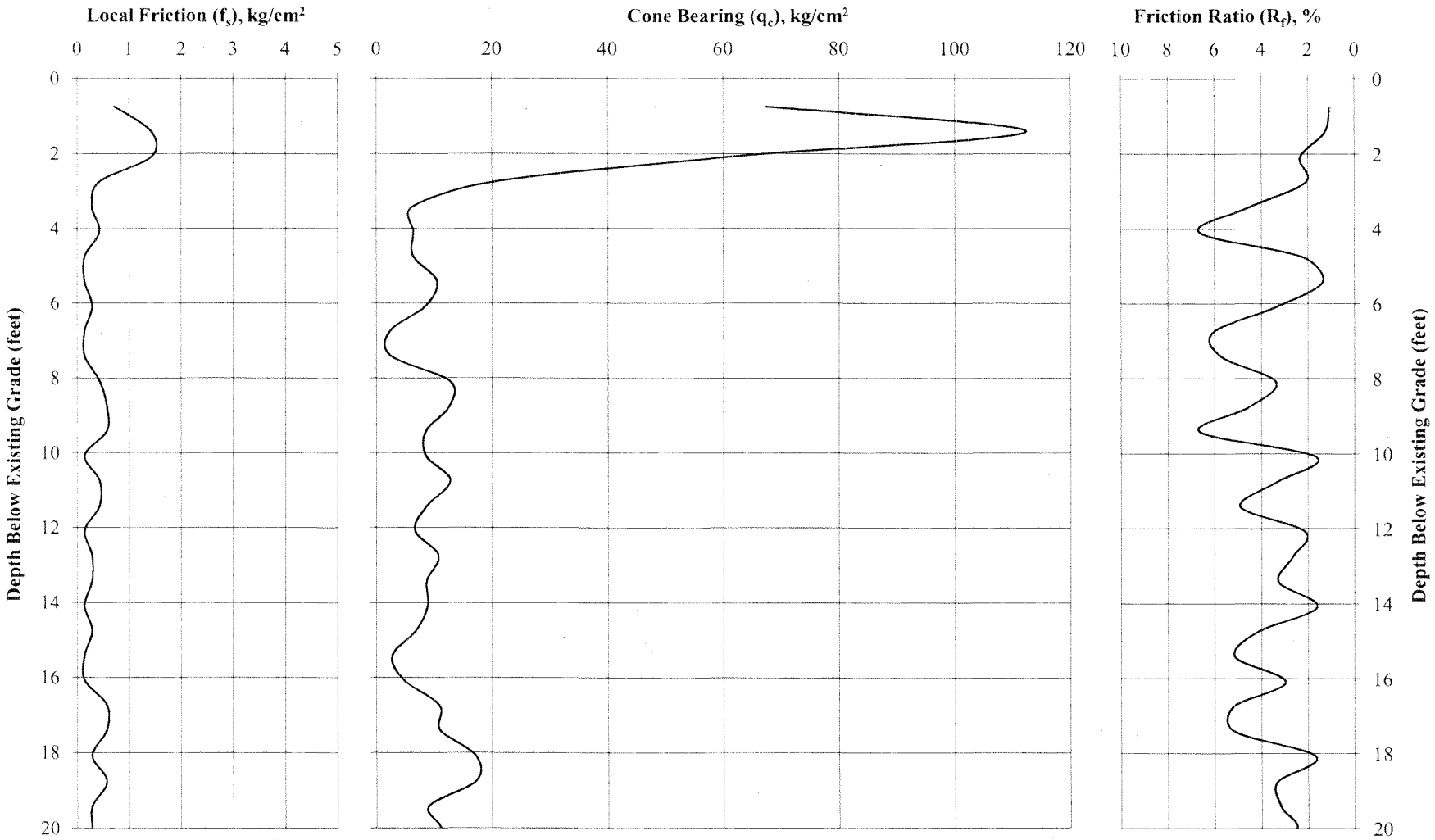

Figure B-12a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-12**
LOCATION: **B-12**
SURFACE ELEVATION: **1148.9 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

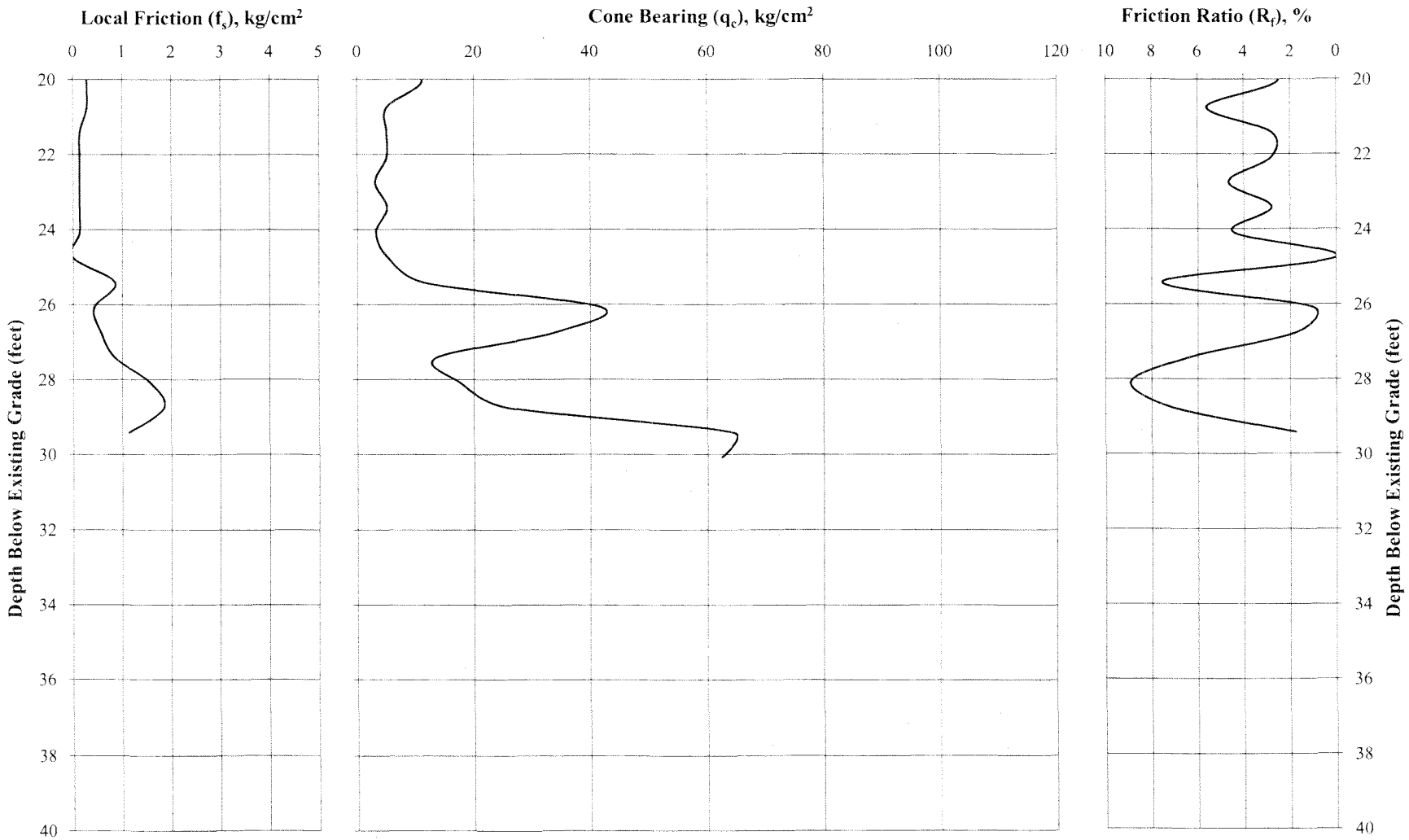

Figure B-12b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-13**
LOCATION: **B-13**
SURFACE ELEVATION: **1149.1 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

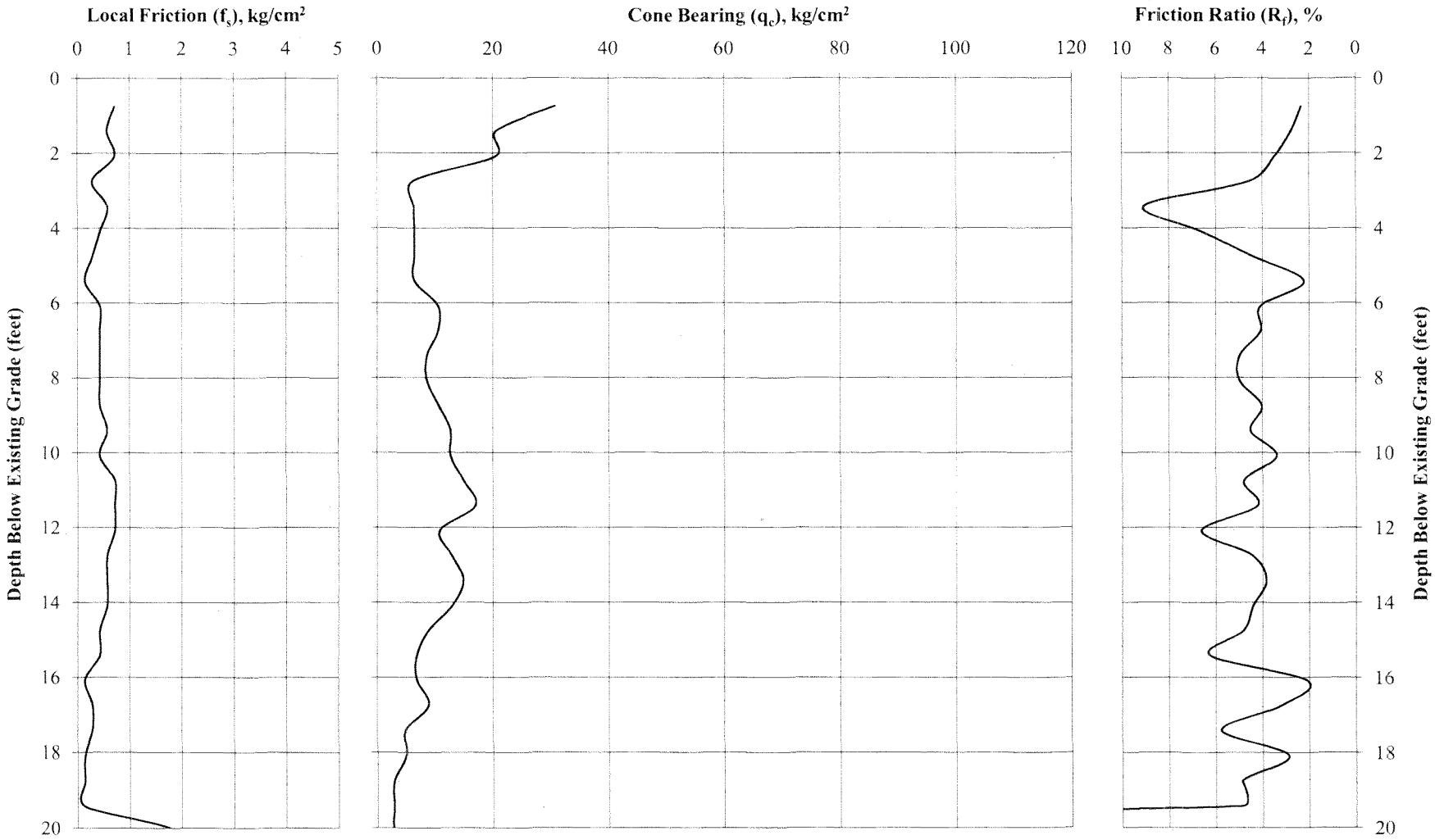

Figure B-13a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-13**
LOCATION: **B-13**
SURFACE ELEVATION: **1149.1 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

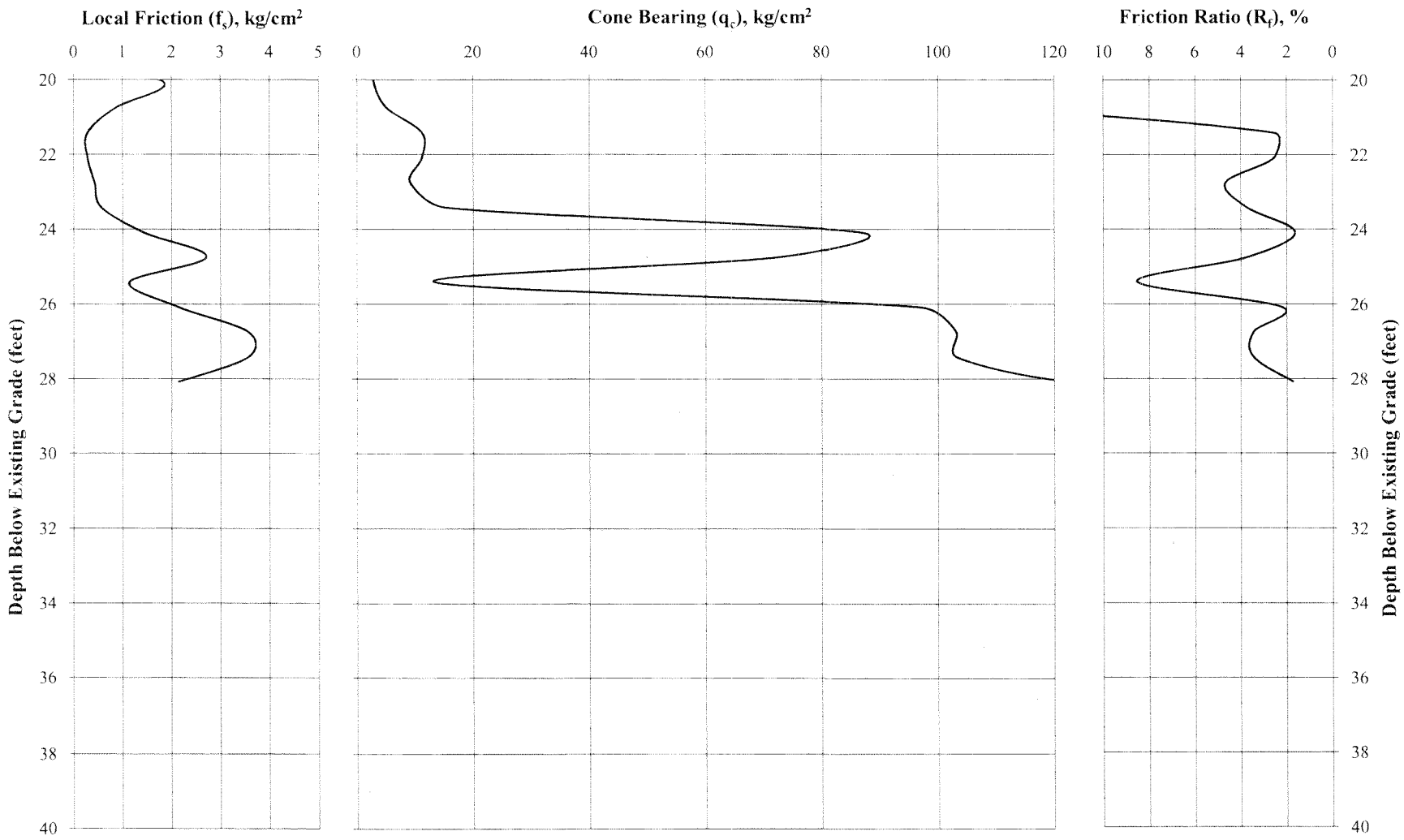

Figure B-13b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-14**
LOCATION: **B-14**
SURFACE ELEVATION: **1146.0 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

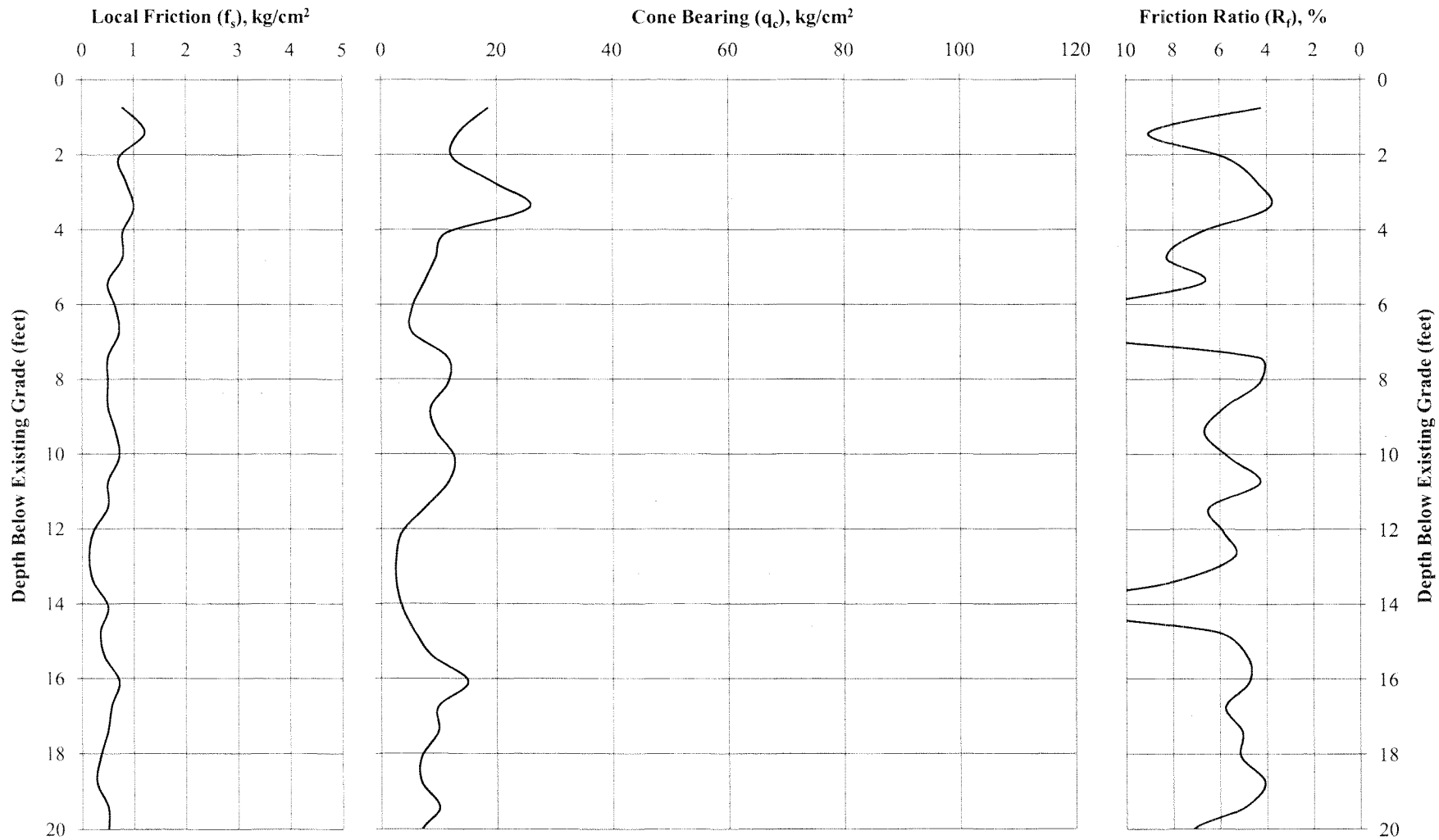

Figure B-14a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-14**
LOCATION: **B-14**
SURFACE ELEVATION: **1146.0 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

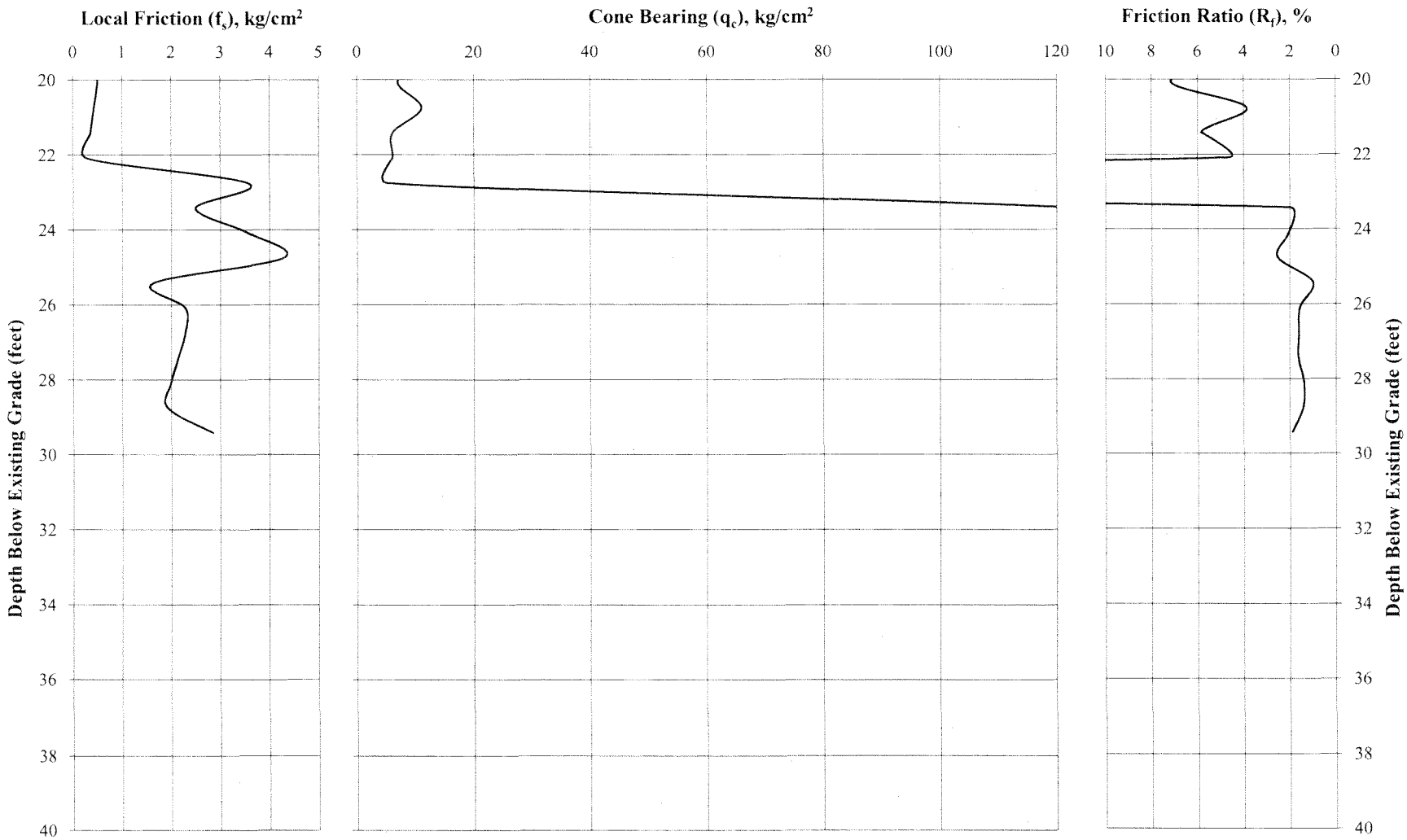

Figure B-14b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-15**
LOCATION: **B-15**
SURFACE ELEVATION: **1145.1 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

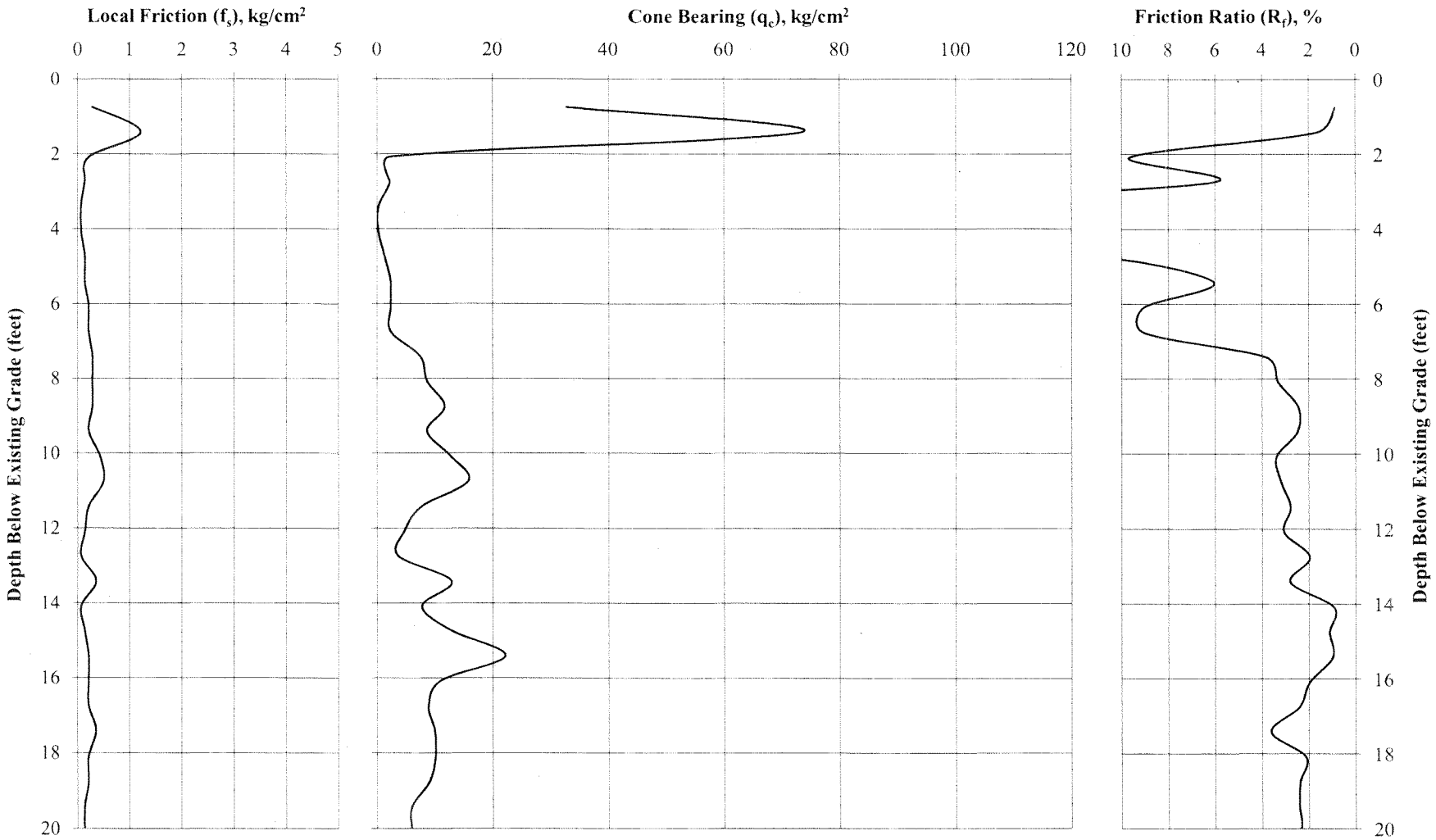

Figure B-15a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-15**
LOCATION: **B-15**
SURFACE ELEVATION: **1145.1 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

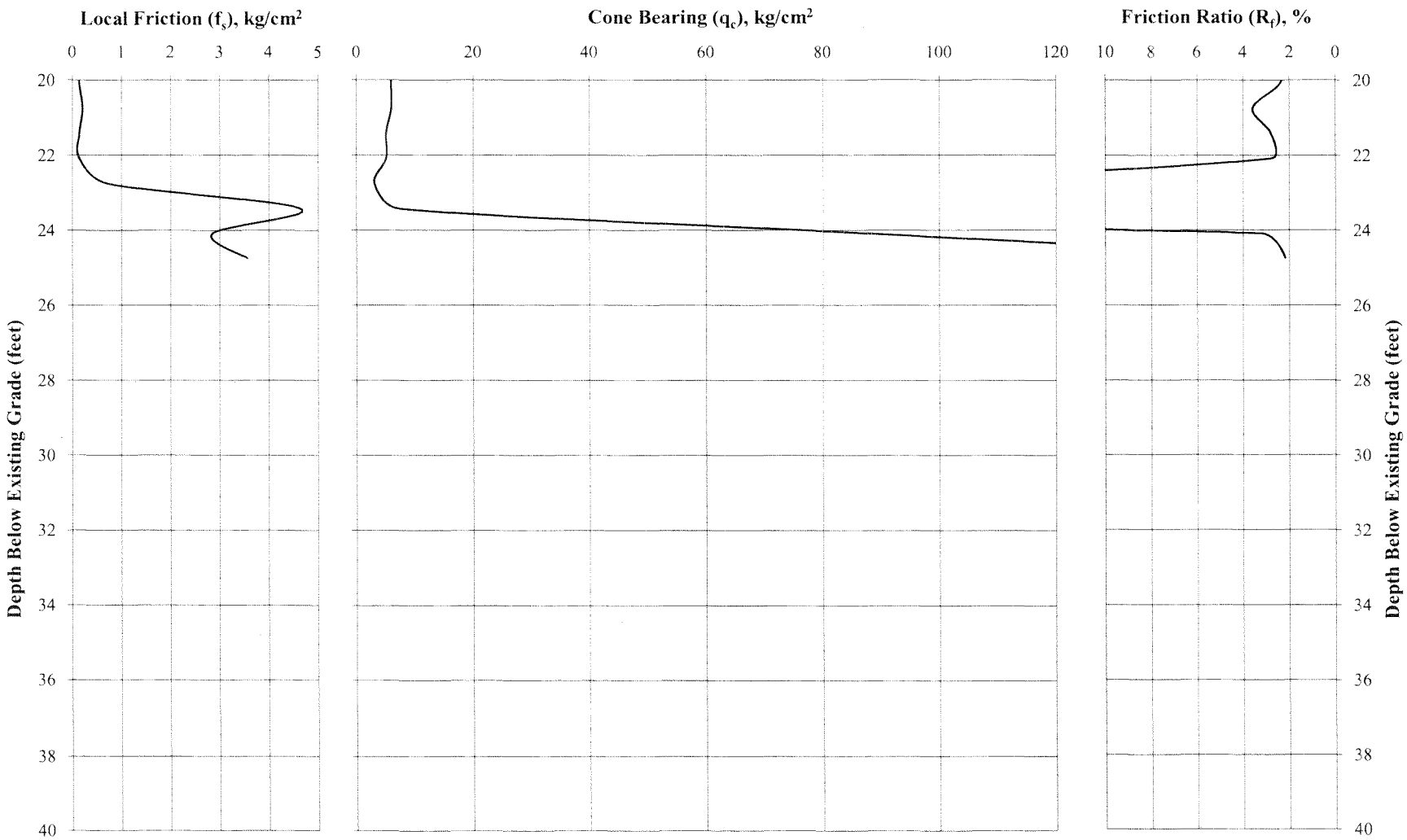

Figure B-15b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-16**
LOCATION: **B-16**
SURFACE ELEVATION: **1146.8 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

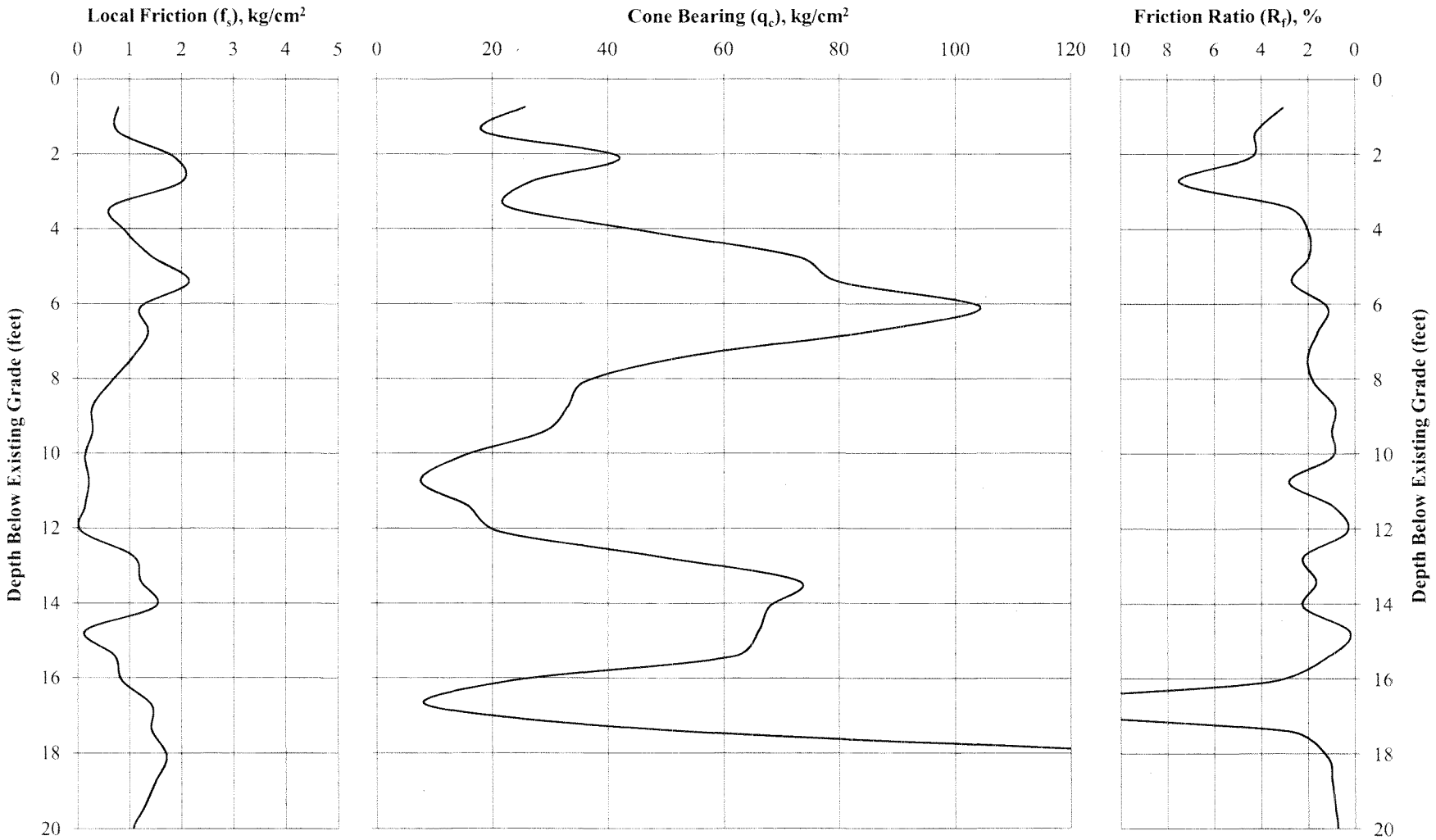

Figure B-16a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-16**
LOCATION: **B-16**
SURFACE ELEVATION: **1146.8 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

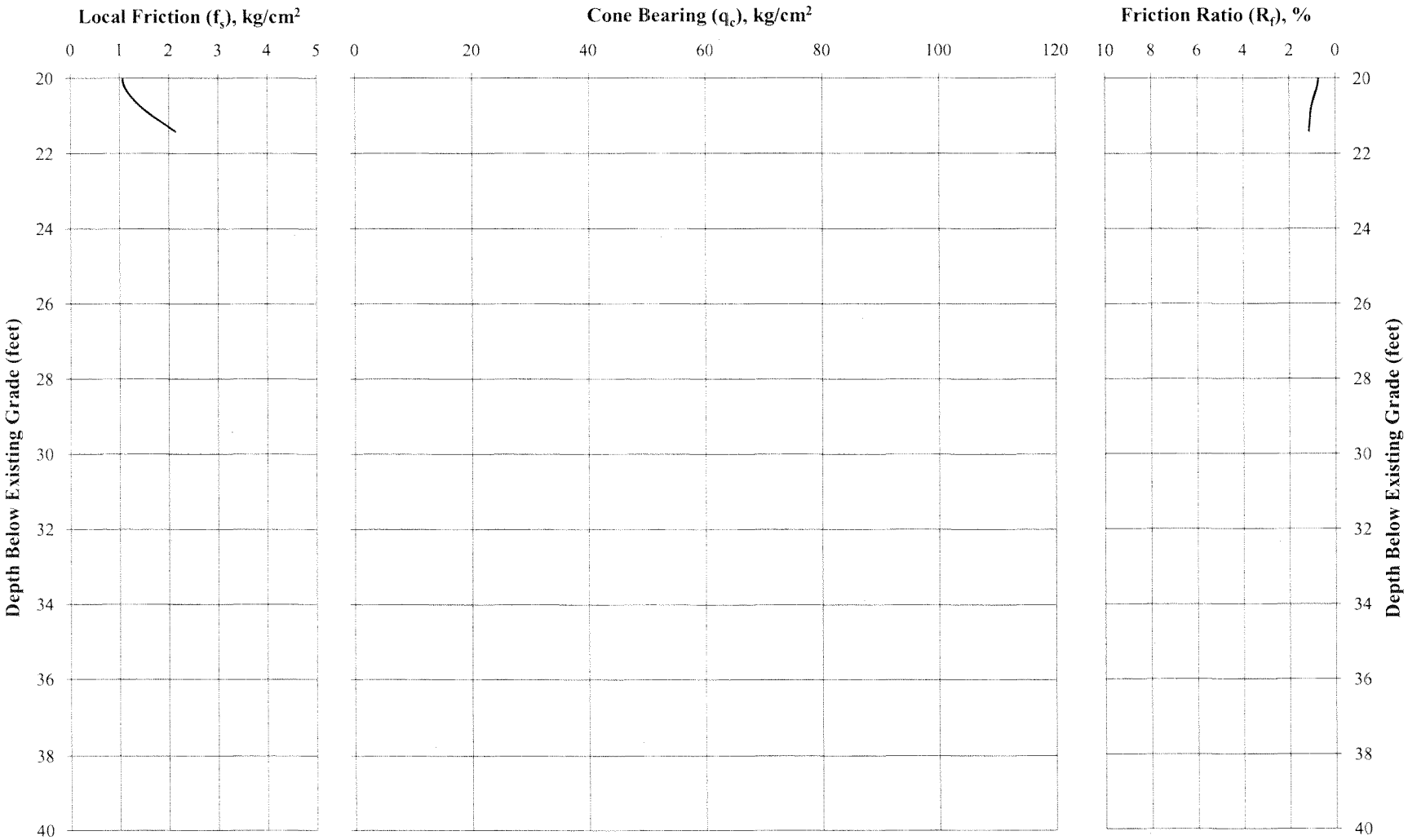

Figure B-16b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-17**
LOCATION: **B-17**
SURFACE ELEVATION: **1151.0 feet**

DATE: **October 11, 2010**
TESTED BY: **BB**
RECORDED BY: **LDI**

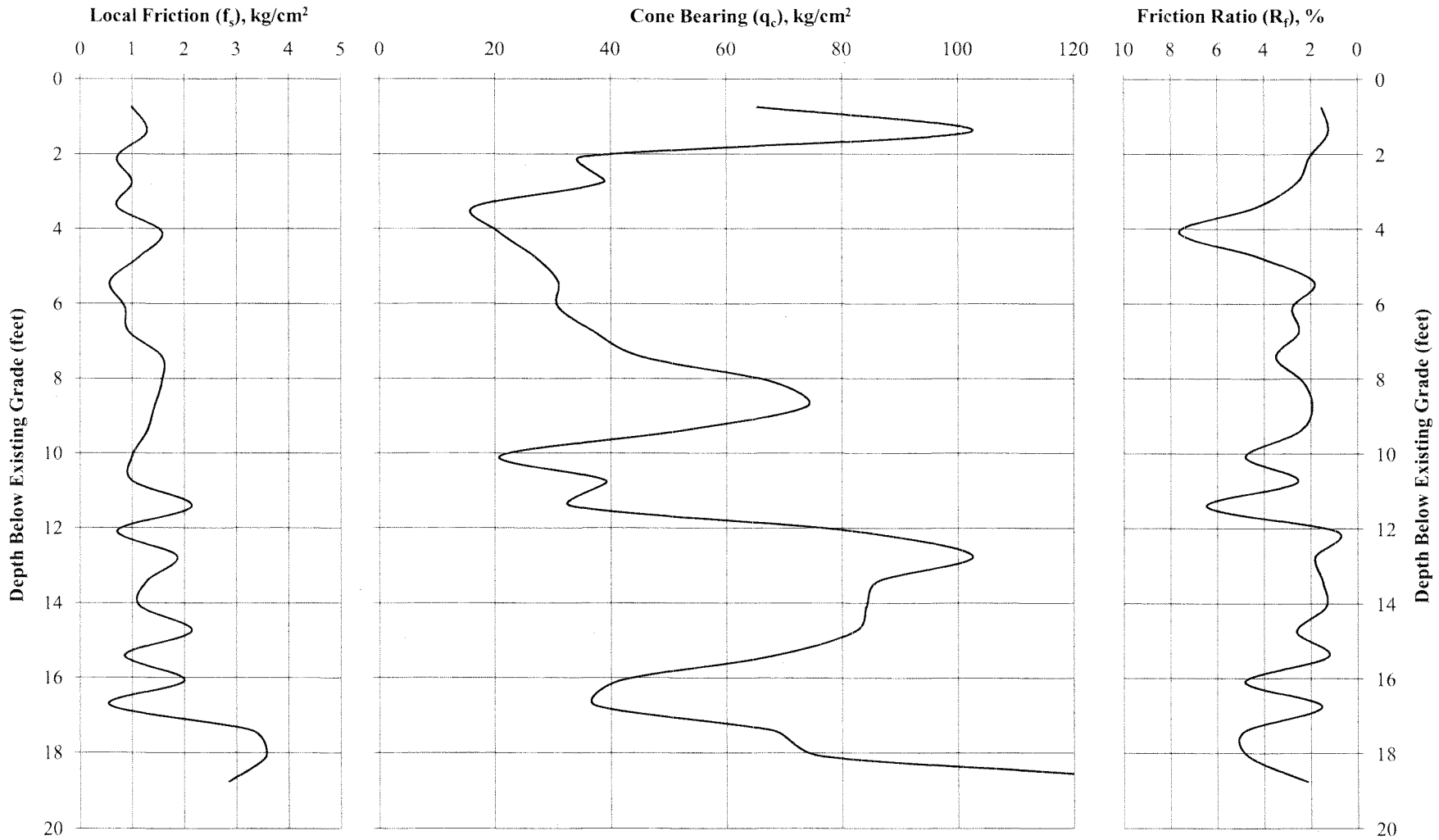

Figure B-17a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-18**
LOCATION: **B-18**
SURFACE ELEVATION: **1148.8 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

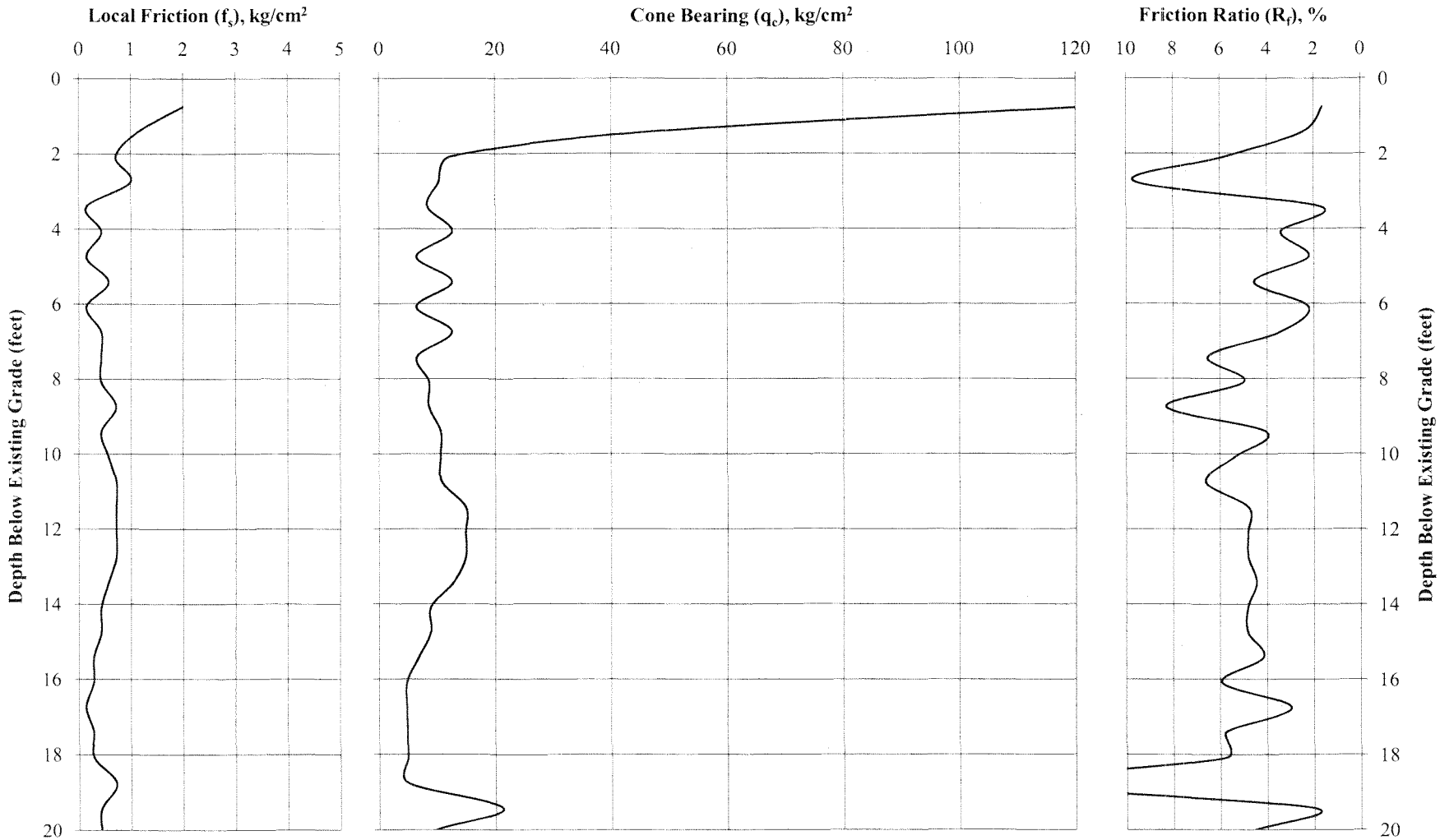

Figure B-18a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-18**
LOCATION: **B-18**
SURFACE ELEVATION: **1148.8 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

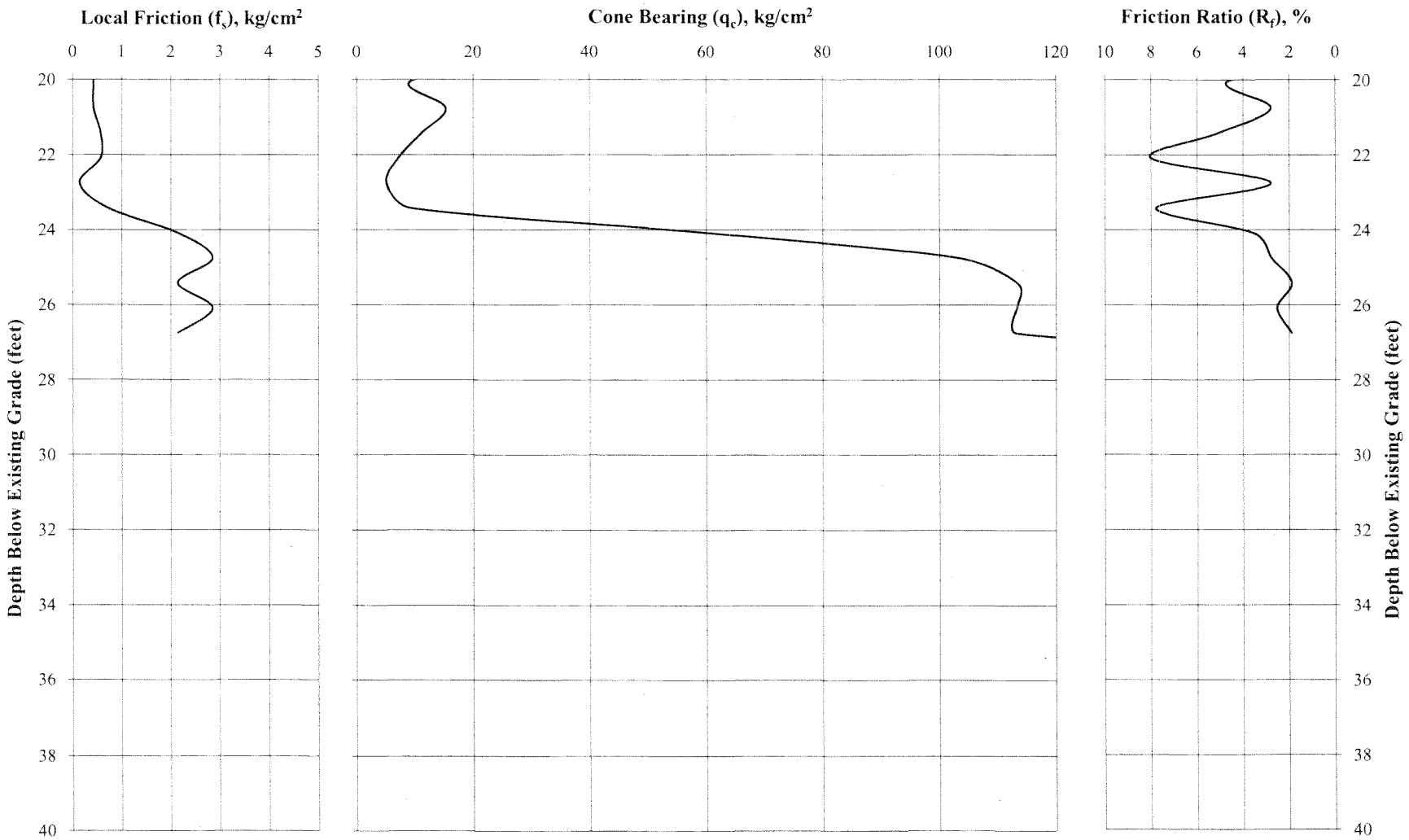

Figure B-18b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-19**
LOCATION: **B-19**
SURFACE ELEVATION: **1146.3 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

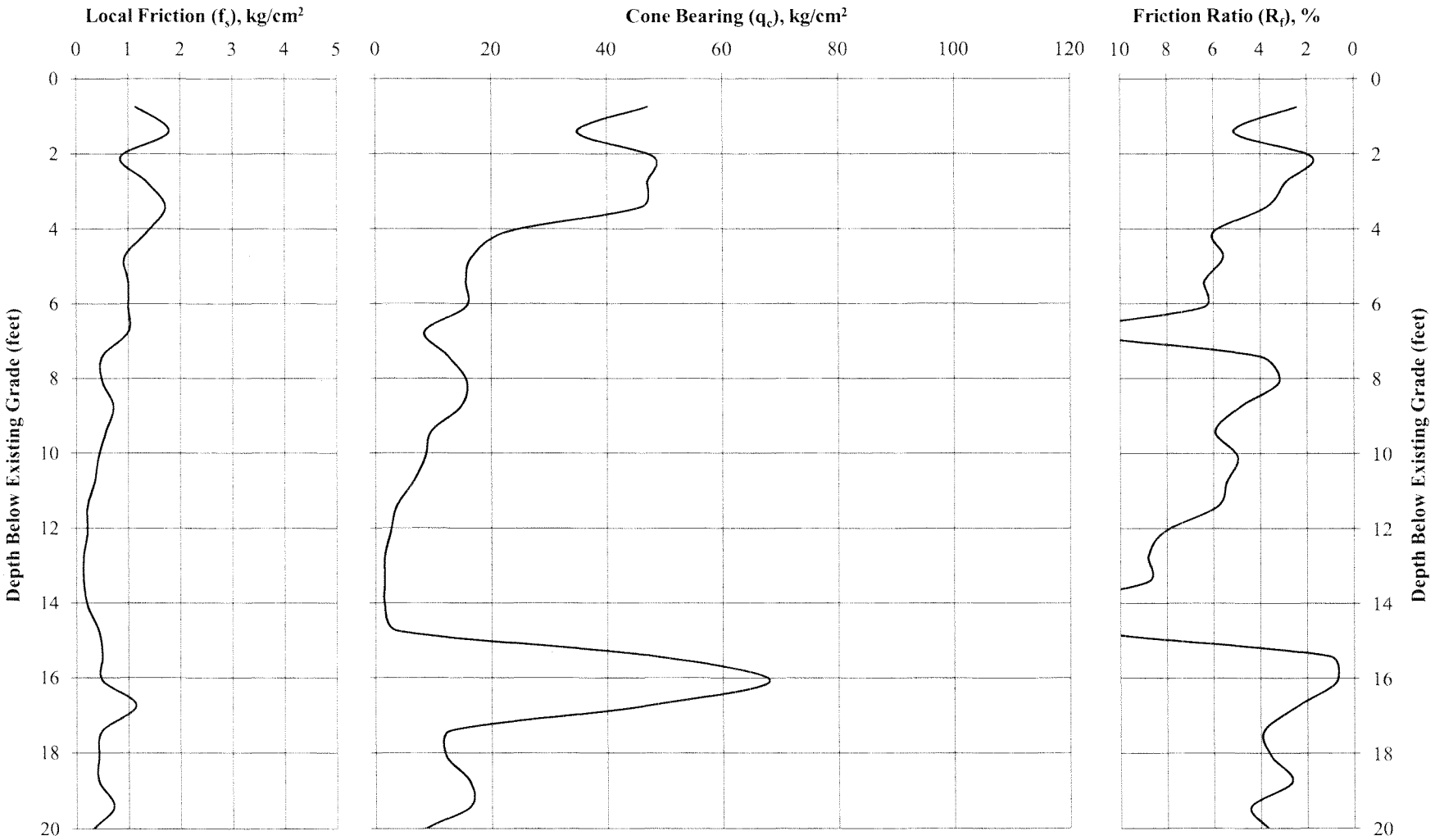

Figure B-19a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-19**
LOCATION: **B-19**
SURFACE ELEVATION: **1146.3 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

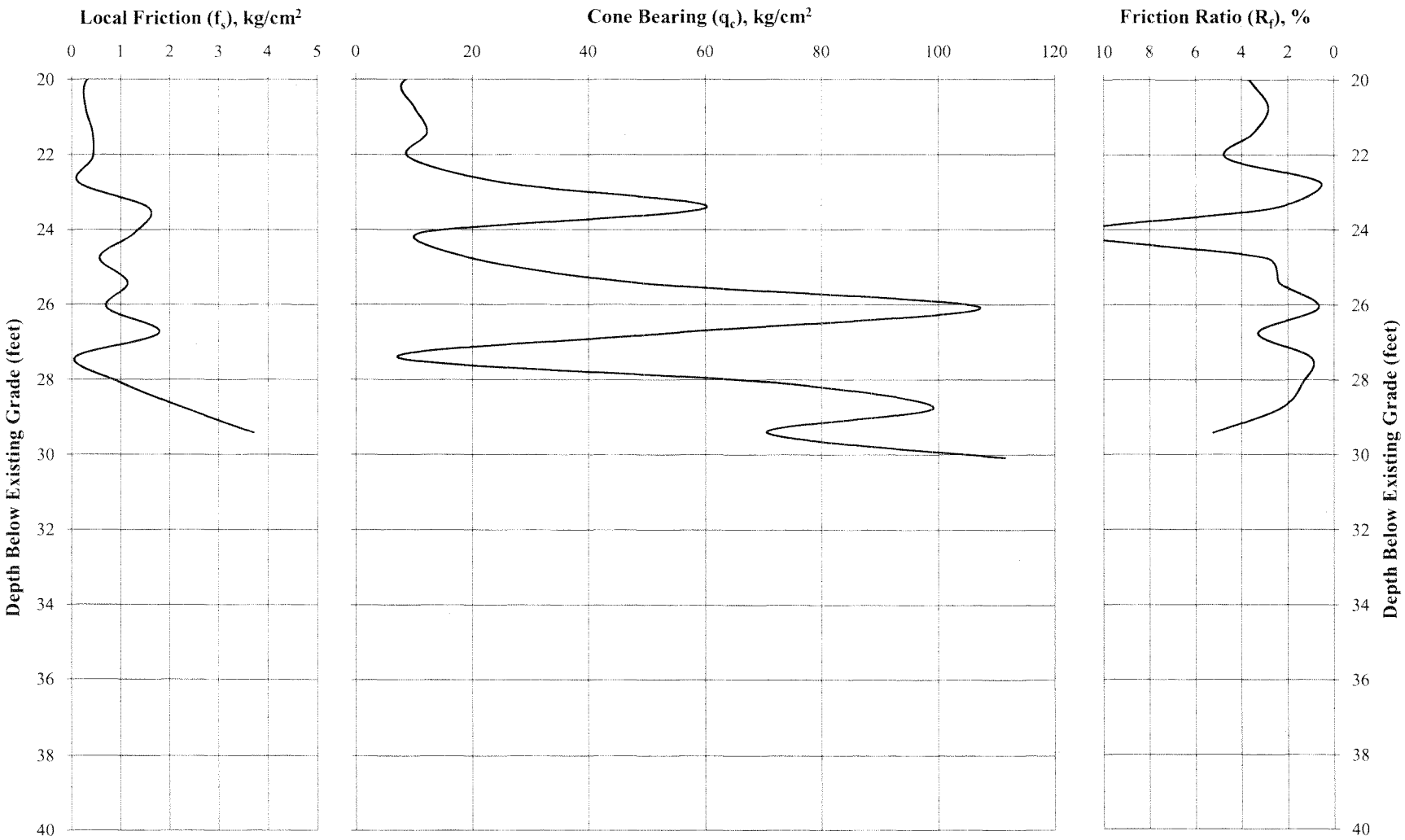

Figure B-19b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-20**
LOCATION: **B-20**
SURFACE ELEVATION: **1146.1 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

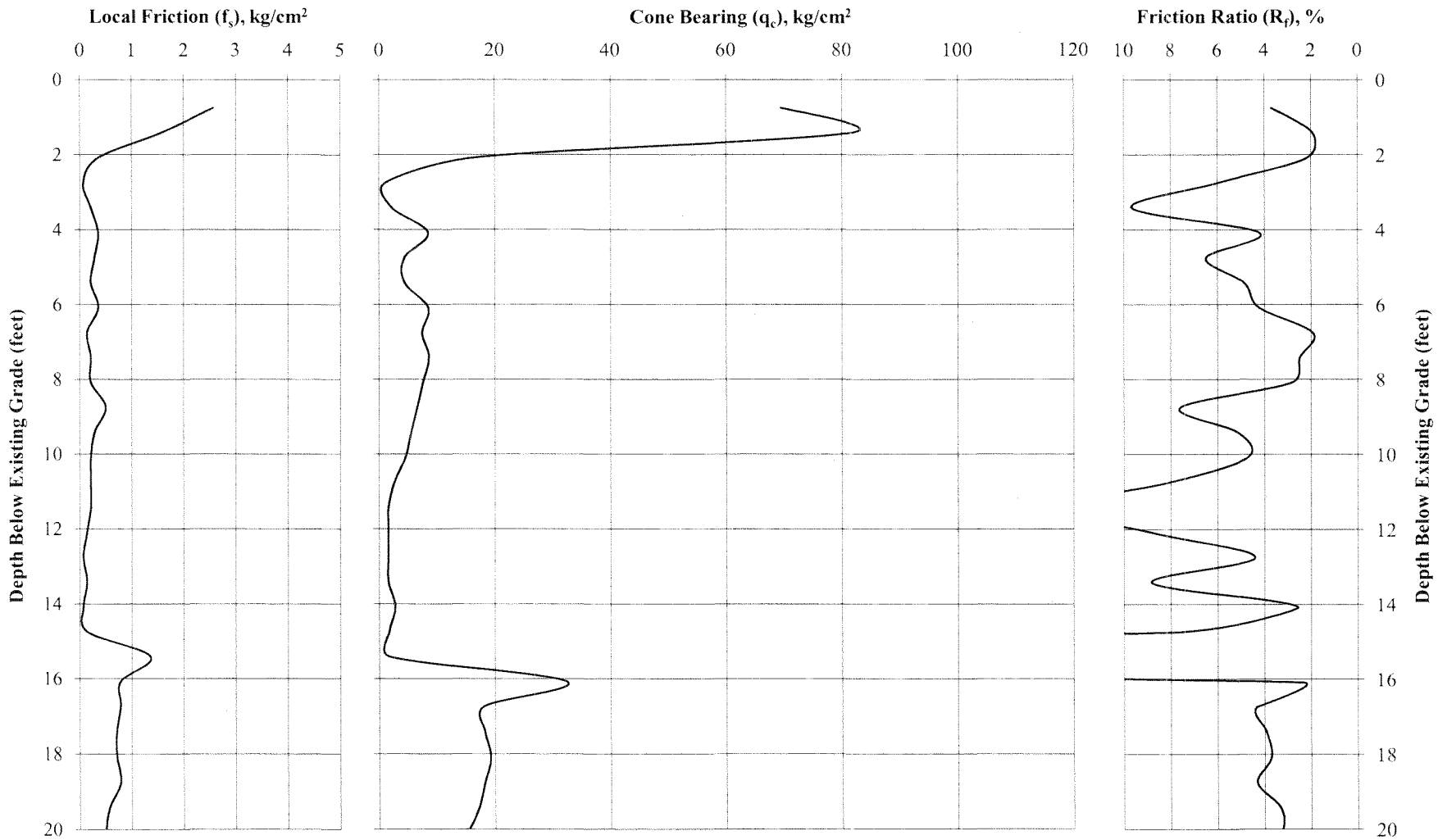

Figure B-20a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-20**
LOCATION: **B-20**
SURFACE ELEVATION: **1146.1 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

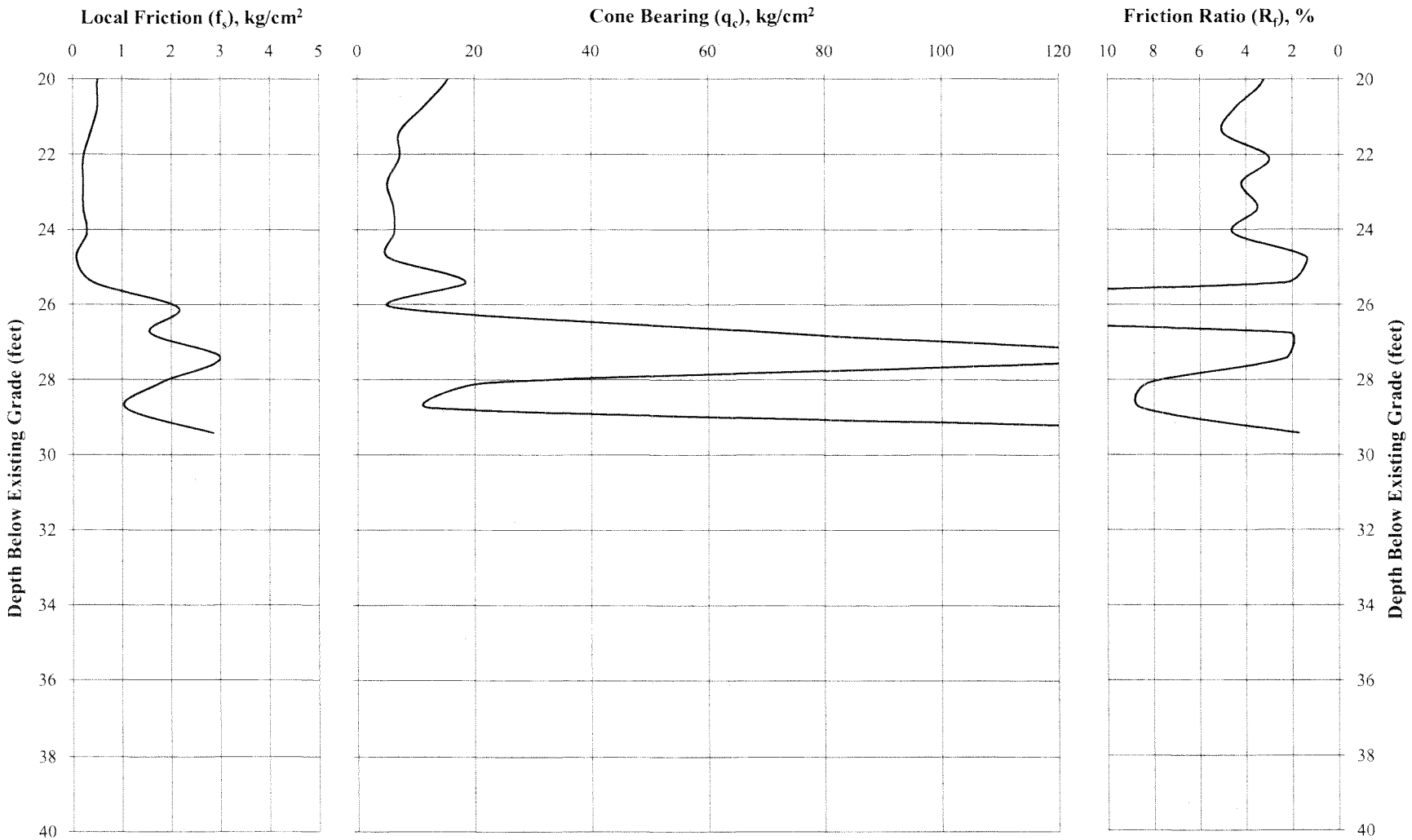

Figure B-20b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-21**
LOCATION: **B-21**
SURFACE ELEVATION: **1150.1 feet**

DATE: **September 24, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

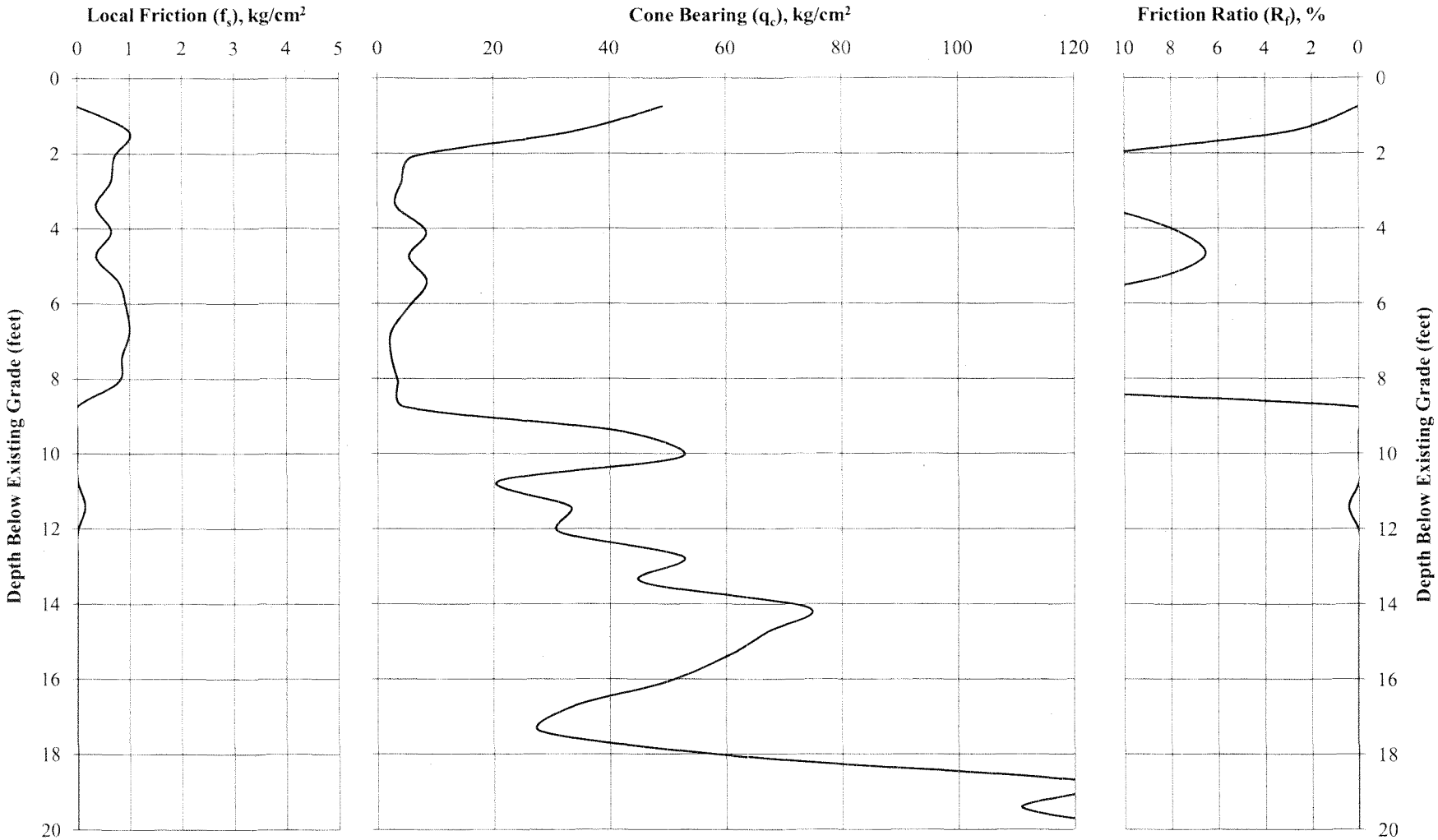

Figure B-21a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-21**
LOCATION: **B-21**
SURFACE ELEVATION: **1150.1 feet**

DATE: **September 24, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

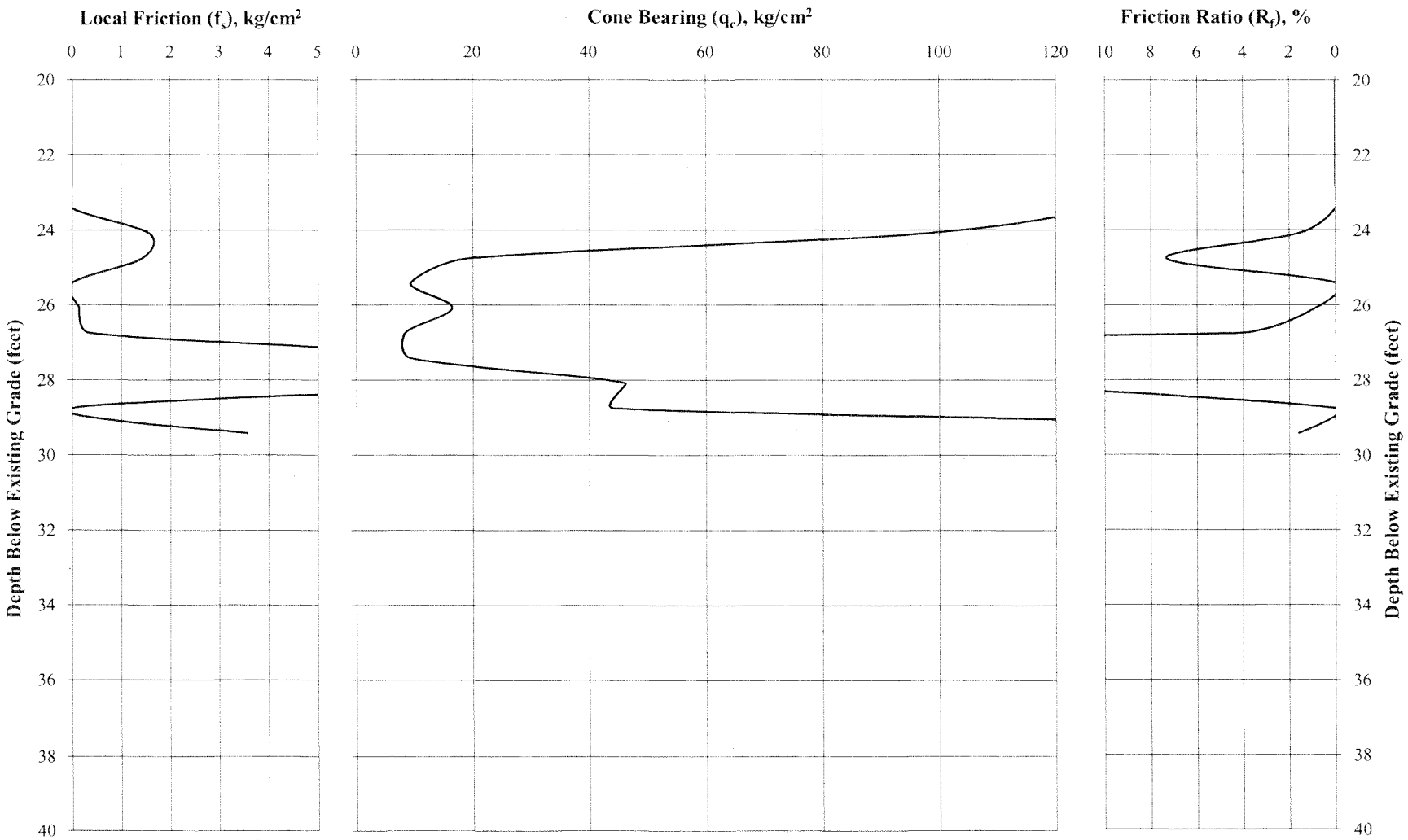

Figure B-21b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-22**
LOCATION: **B-22**
SURFACE ELEVATION: **1151.4 feet**

DATE: **November 11, 2010**
TESTED BY: **CL**
RECORDED BY: **LI**

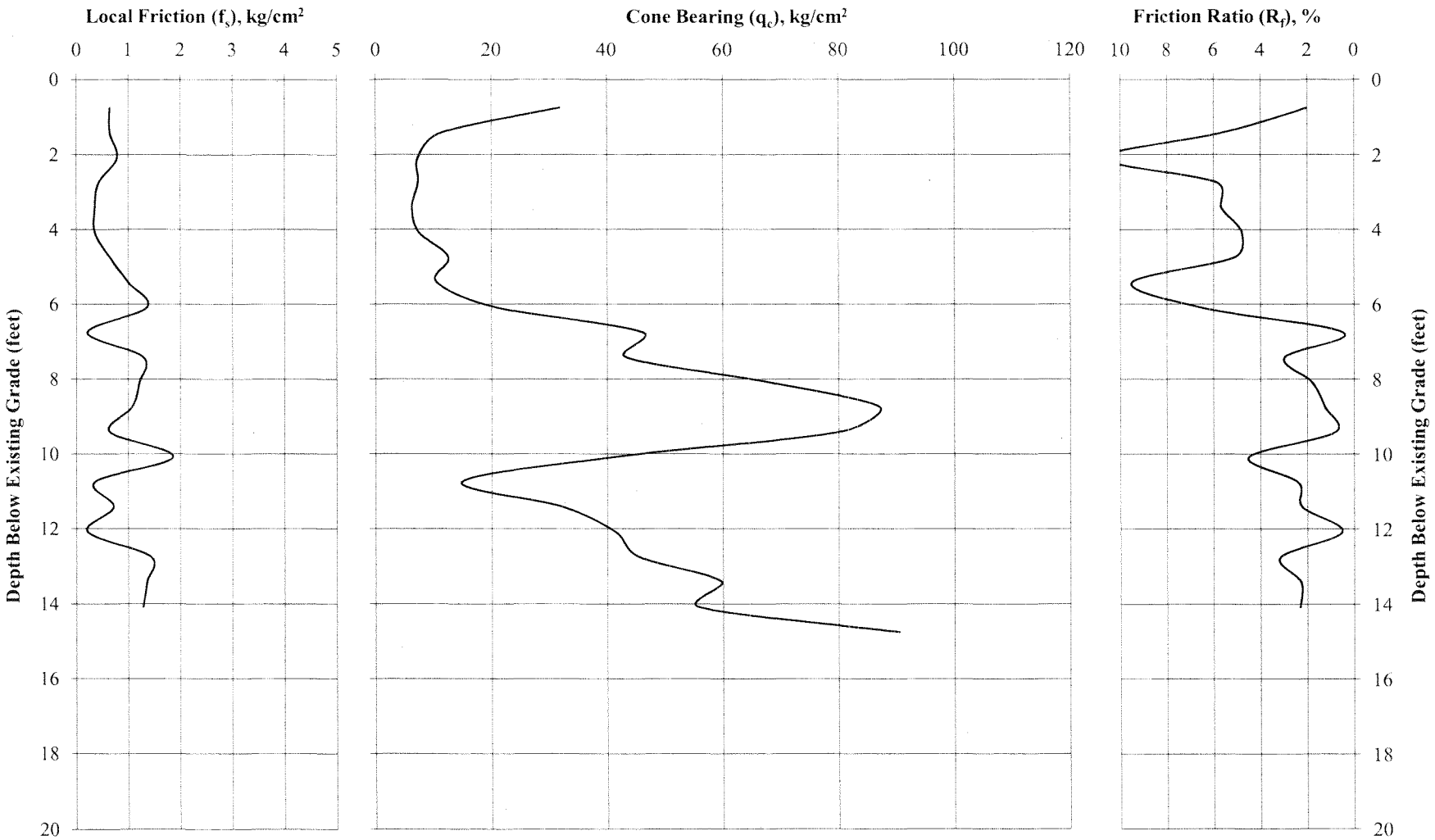

Figure B-22a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-23**
LOCATION: **B-23**
SURFACE ELEVATION: **1150.9 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

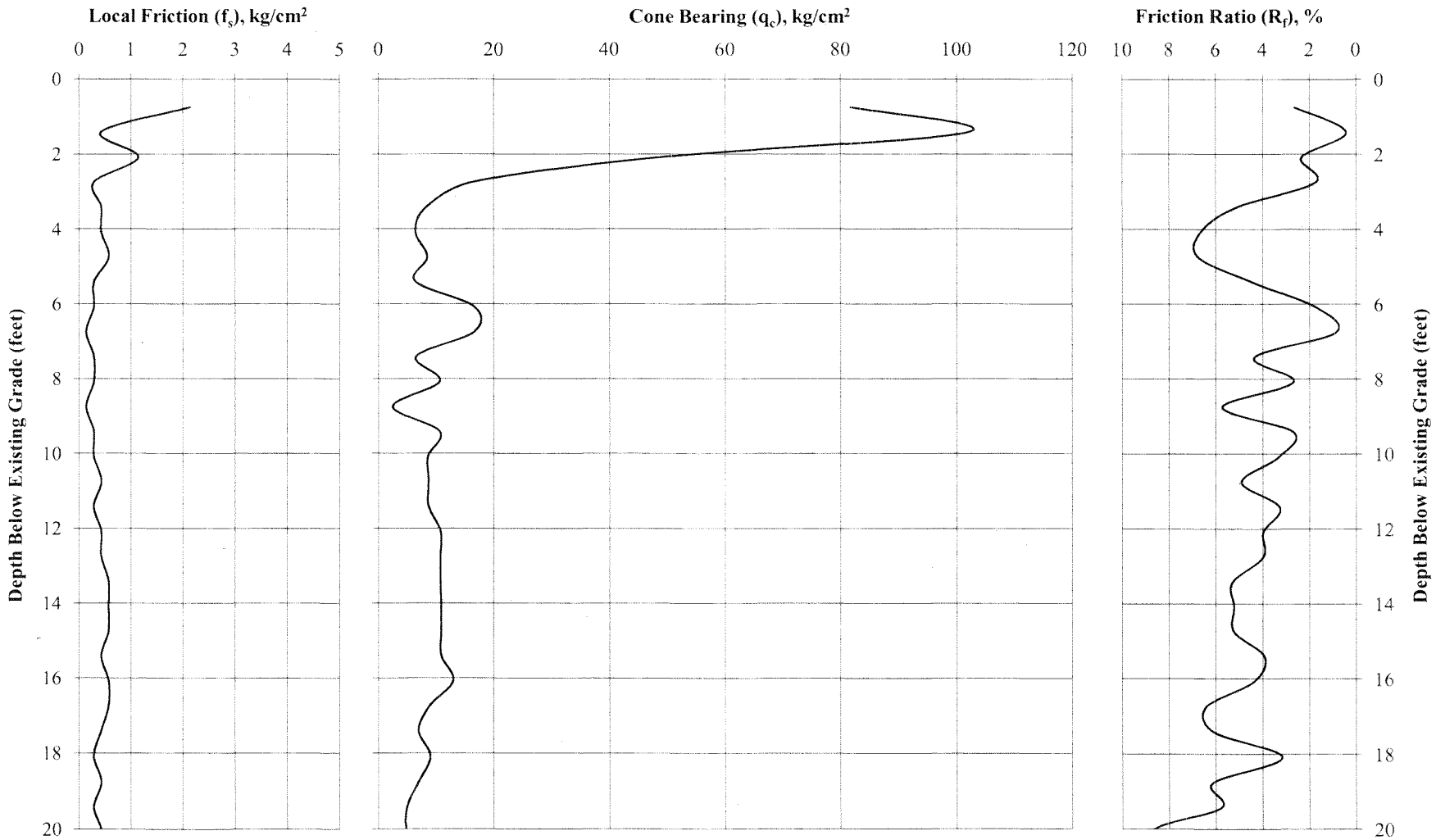

Figure B-23a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-23**
LOCATION: **B-23**
SURFACE ELEVATION: **1150.9 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

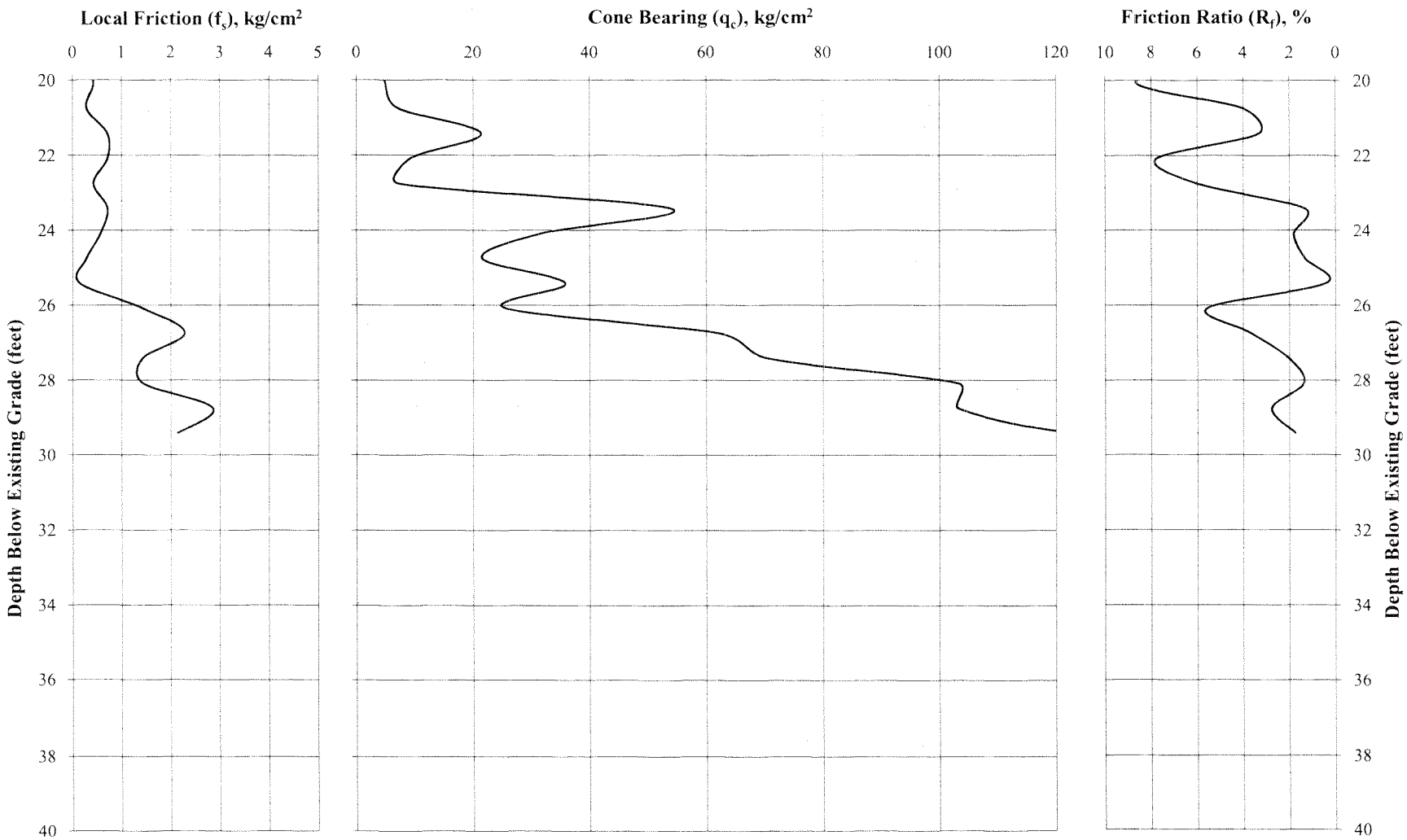

Figure B-23b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-24**
LOCATION: **B-24**
SURFACE ELEVATION: **1148.3 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

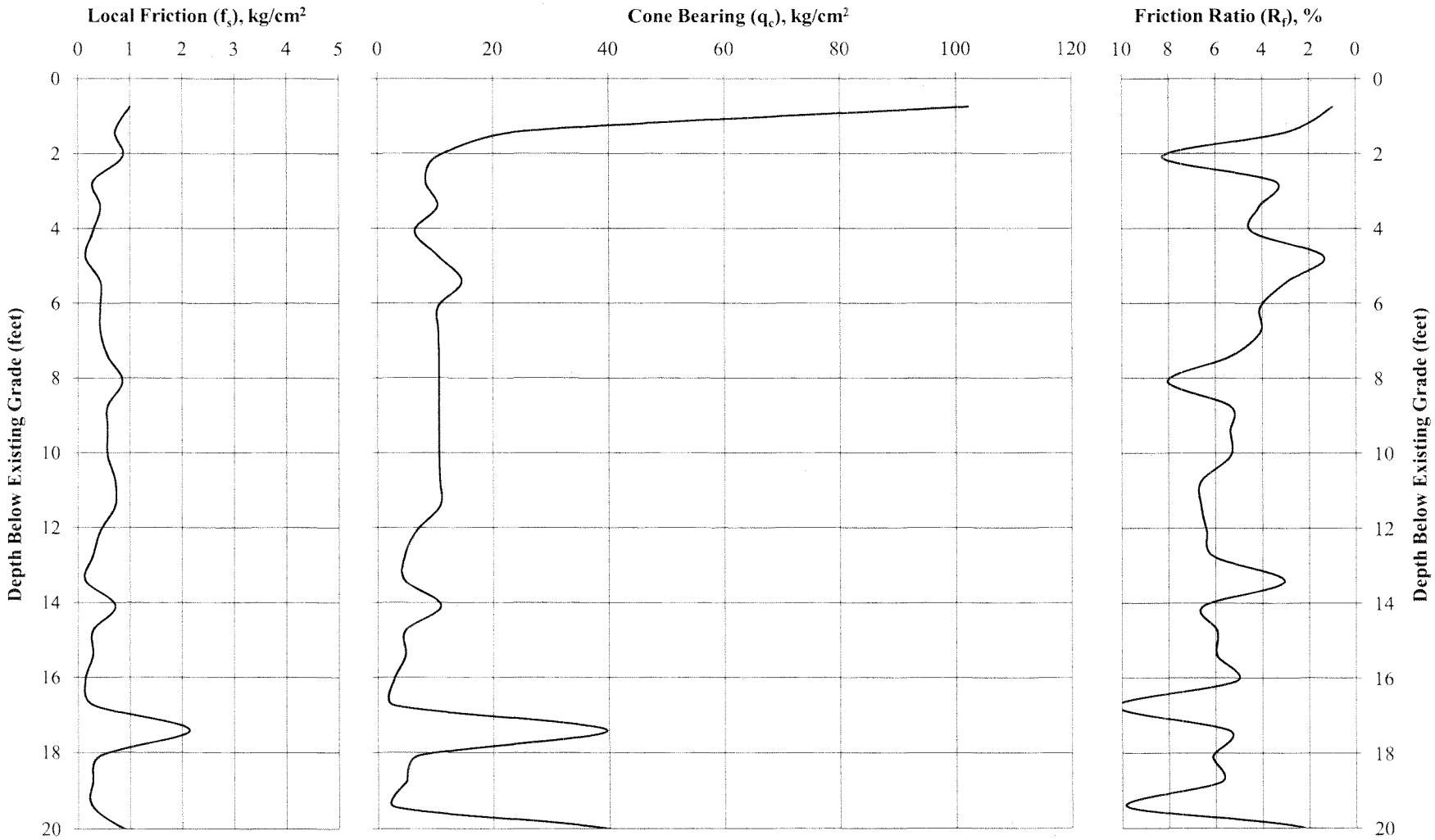

Figure B-24a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-24**
LOCATION: **B-24**
SURFACE ELEVATION: **1148.3 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

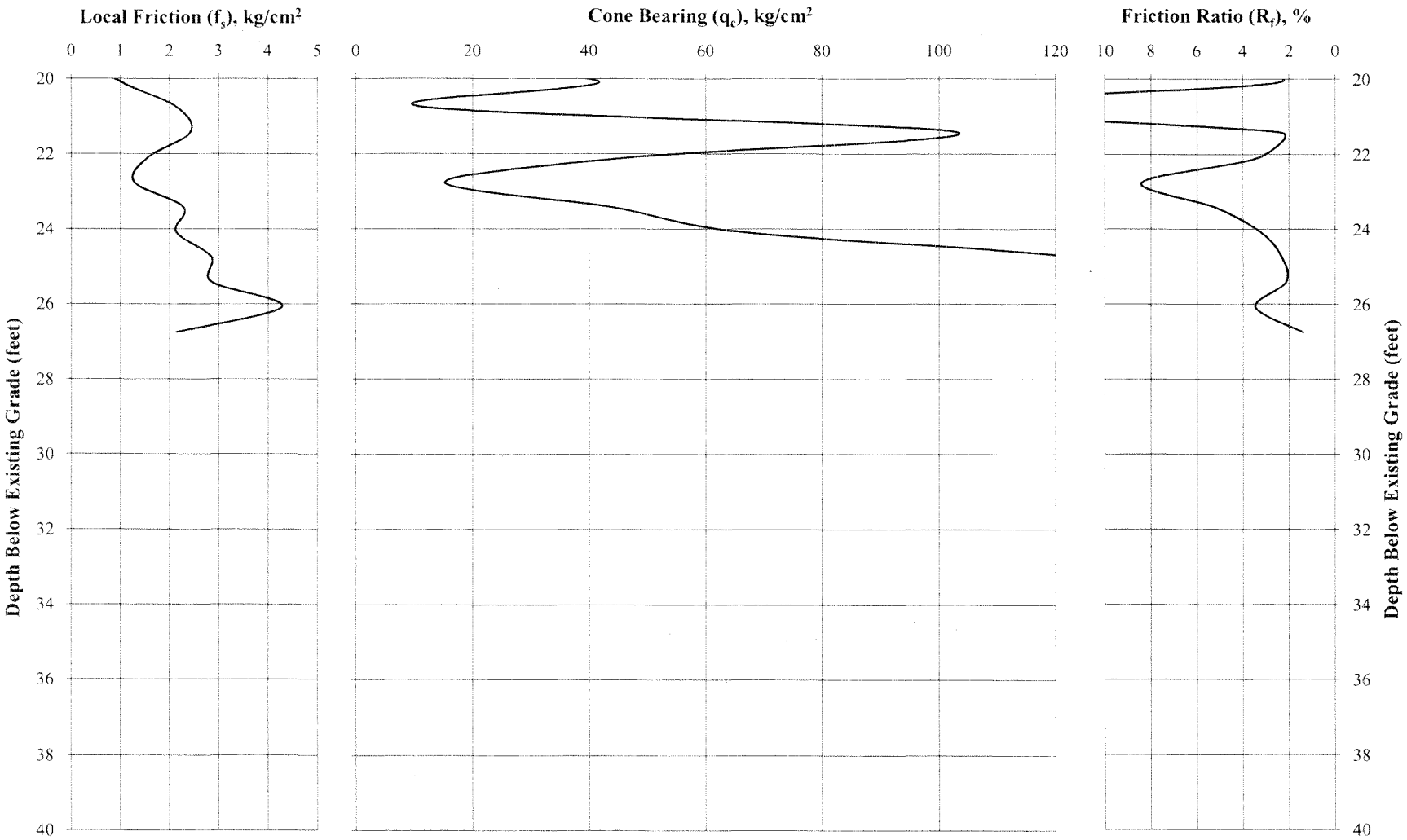

Figure B-24b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-25**
LOCATION: **B-25**
SURFACE ELEVATION: **1146.9 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

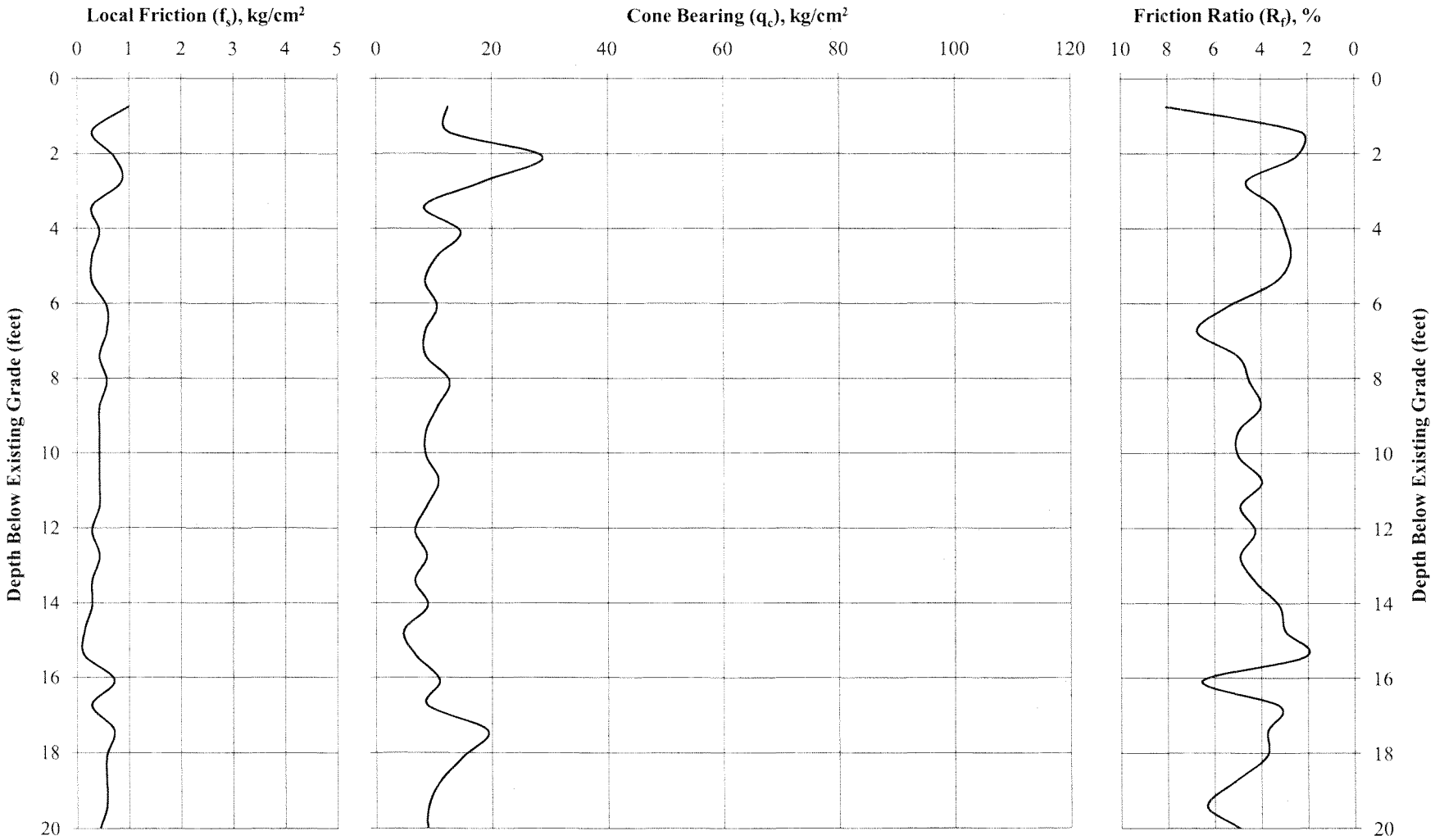

Figure B-25a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-25**
LOCATION: **B-25**
SURFACE ELEVATION: **1146.9 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

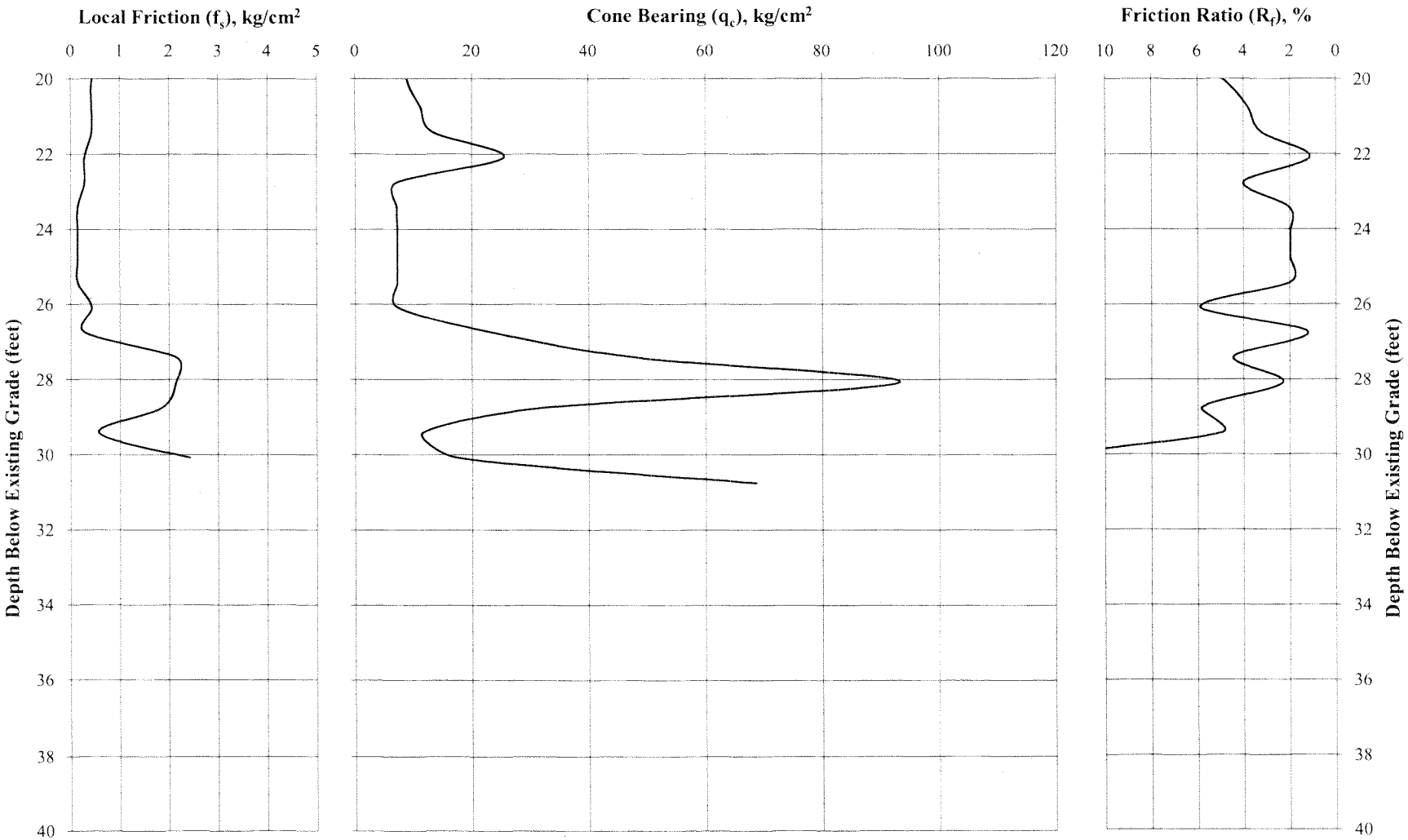

Figure B-25b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-26**
LOCATION: **B-26**
SURFACE ELEVATION: **1146.5 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

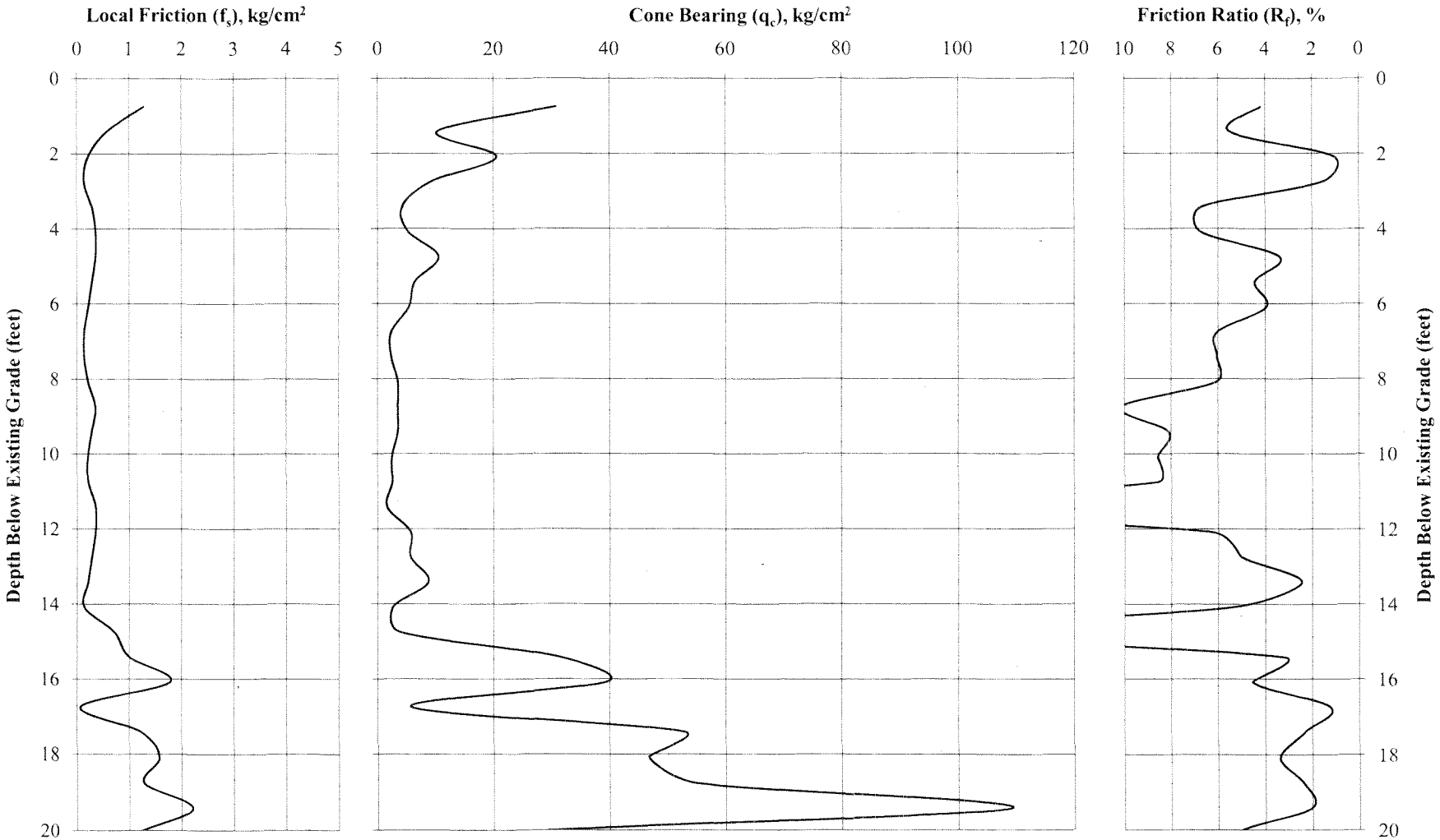

Figure B-26a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-26**
LOCATION: **B-26**
SURFACE ELEVATION: **1146.5 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

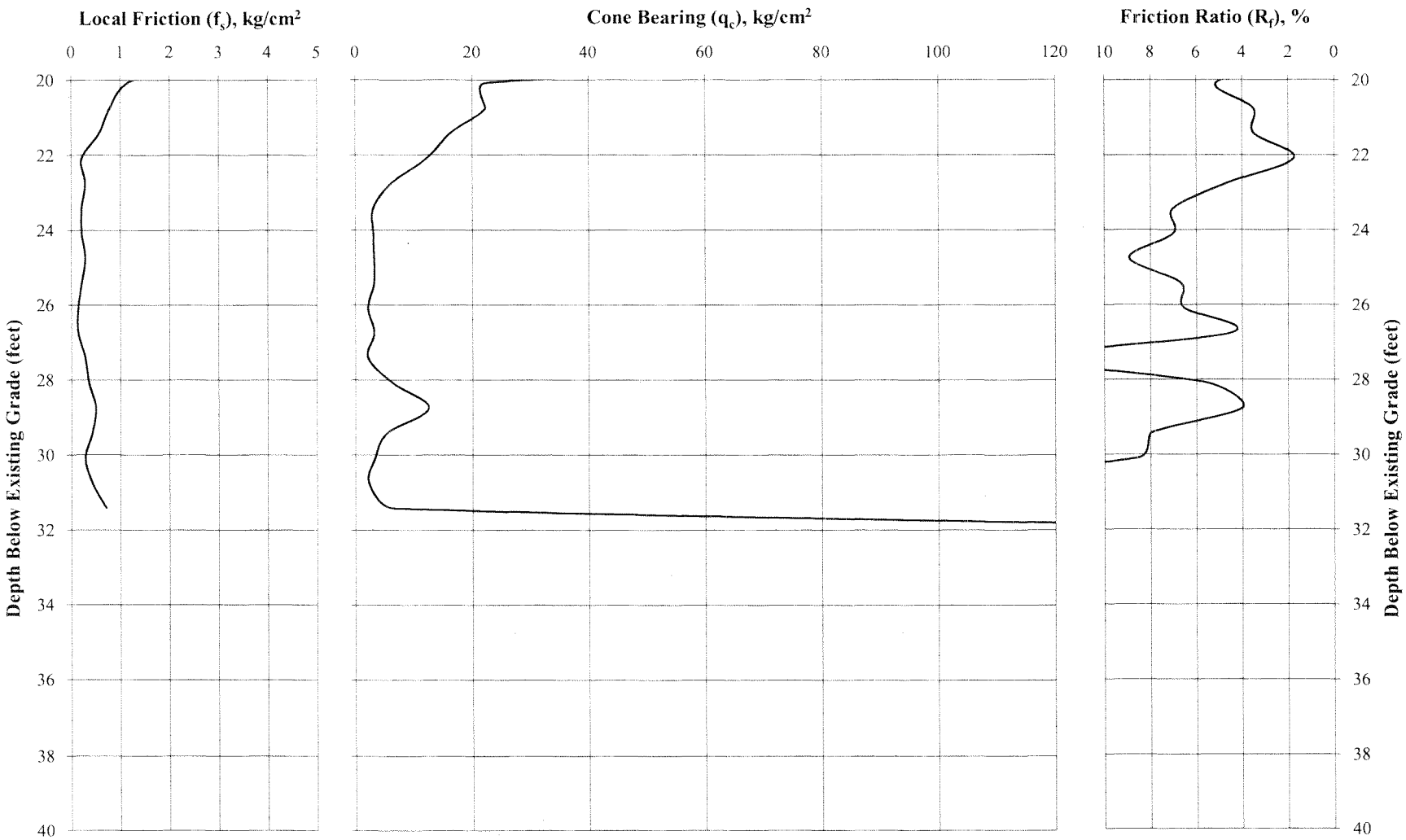

Figure B-26b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-27**
LOCATION: **B-27**
SURFACE ELEVATION: **1149.7 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

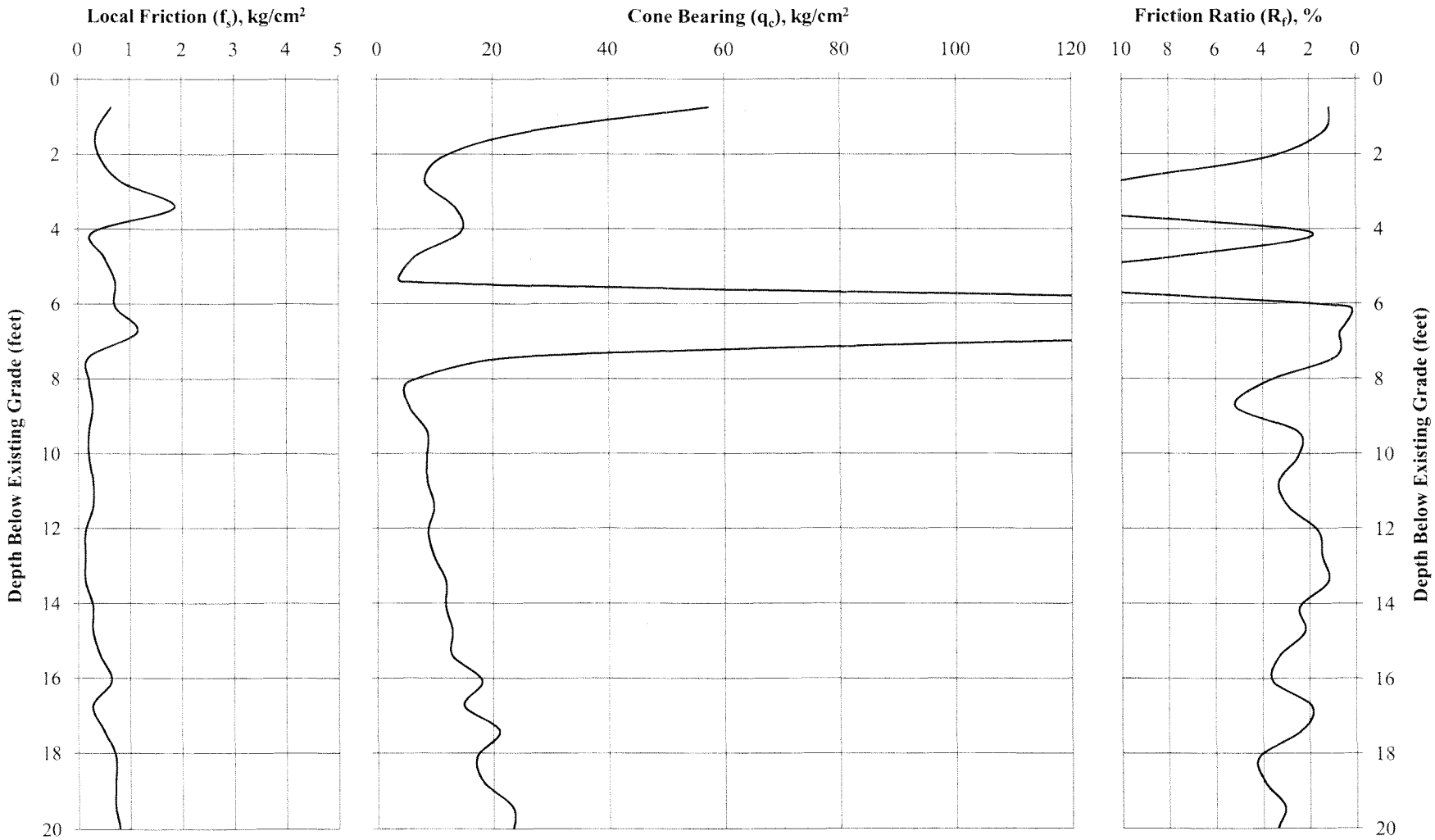

Figure B-27a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-27**
LOCATION: **B-27**
SURFACE ELEVATION: **1149.7 feet**

DATE: **September 22, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

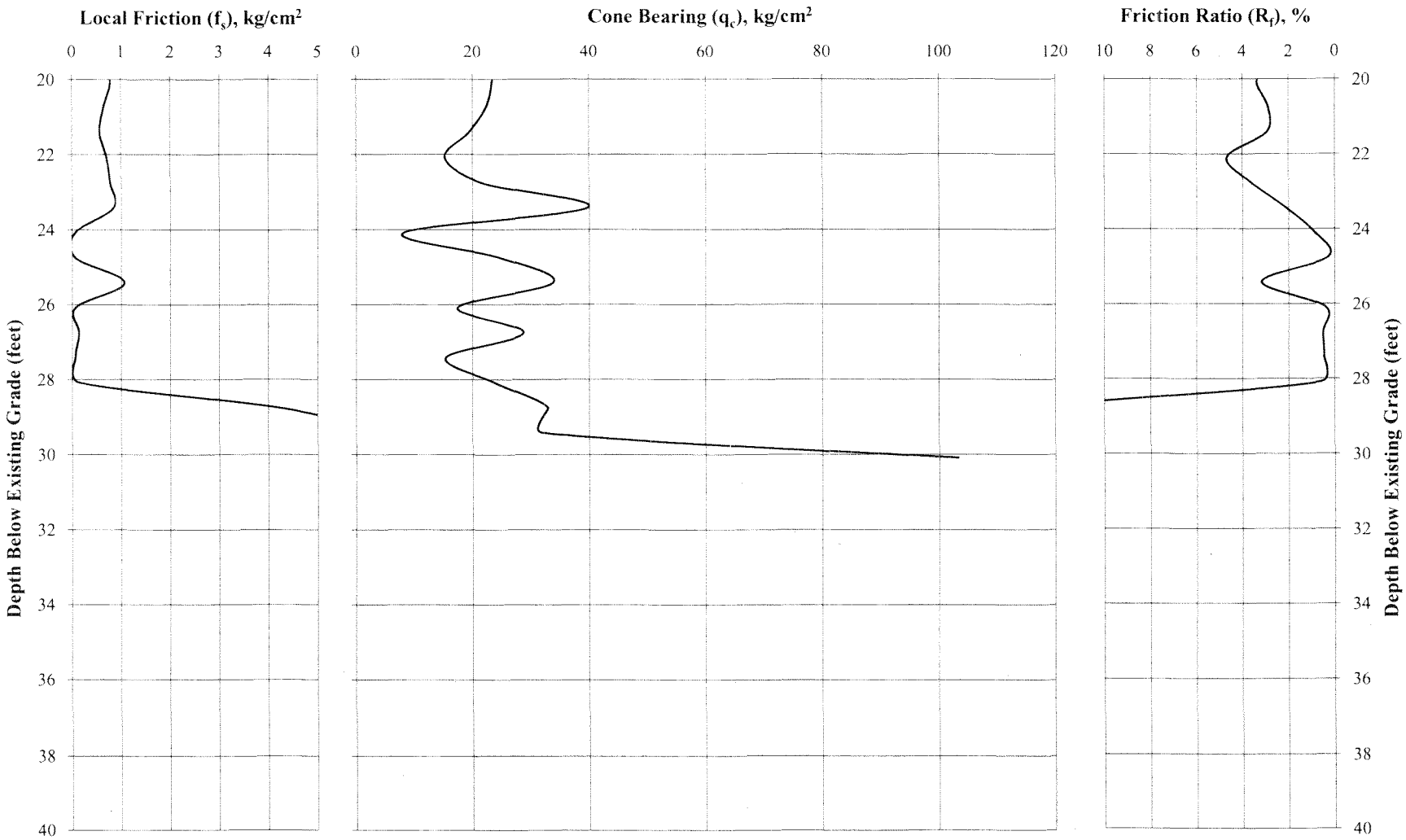

Figure B-27b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-28**
LOCATION: **B-28**
SURFACE ELEVATION: **1152.5 feet**

DATE: **November 11, 2010**
TESTED BY: **CL**
RECORDED BY: **LI**

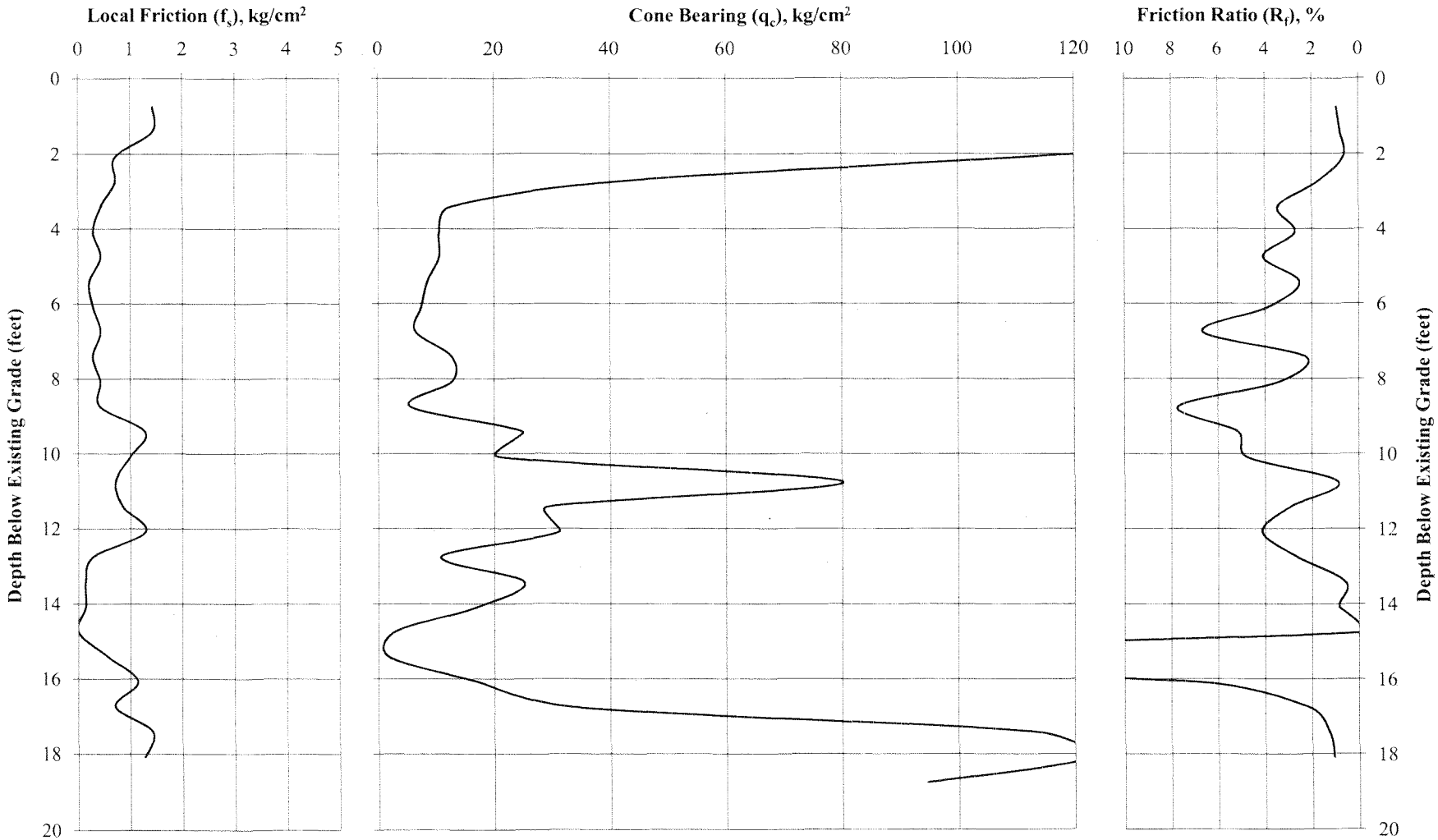

Figure B-28a

Click on the Report p1 tab

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-28**
LOCATION: **B-28**
SURFACE ELEVATION: **1152.5 feet**

DATE: **November 11, 2010**
TESTED BY: **CL**
RECORDED BY: **LI**

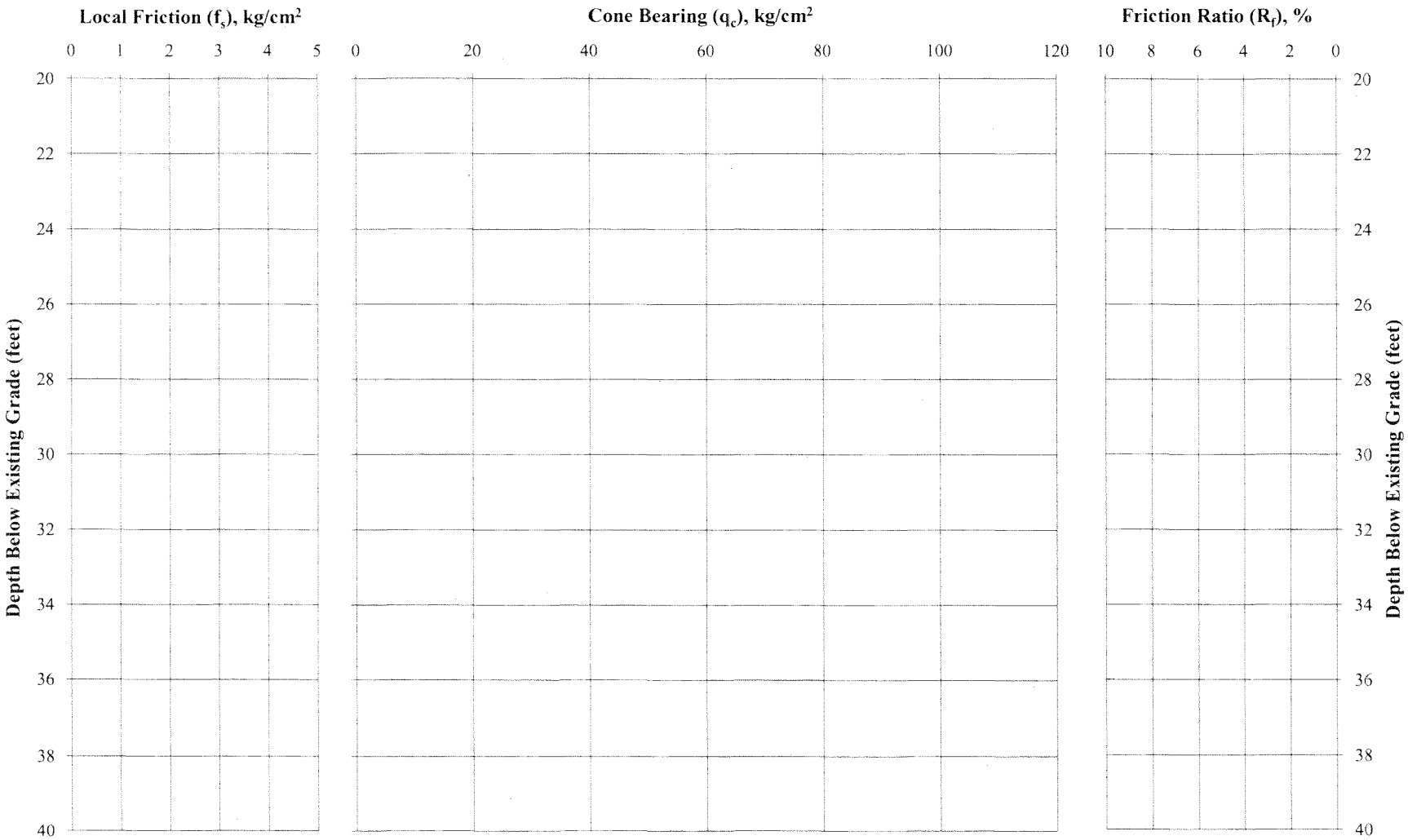

Figure B-28b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-29**
LOCATION: **B-29**
SURFACE ELEVATION: **1151.0 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

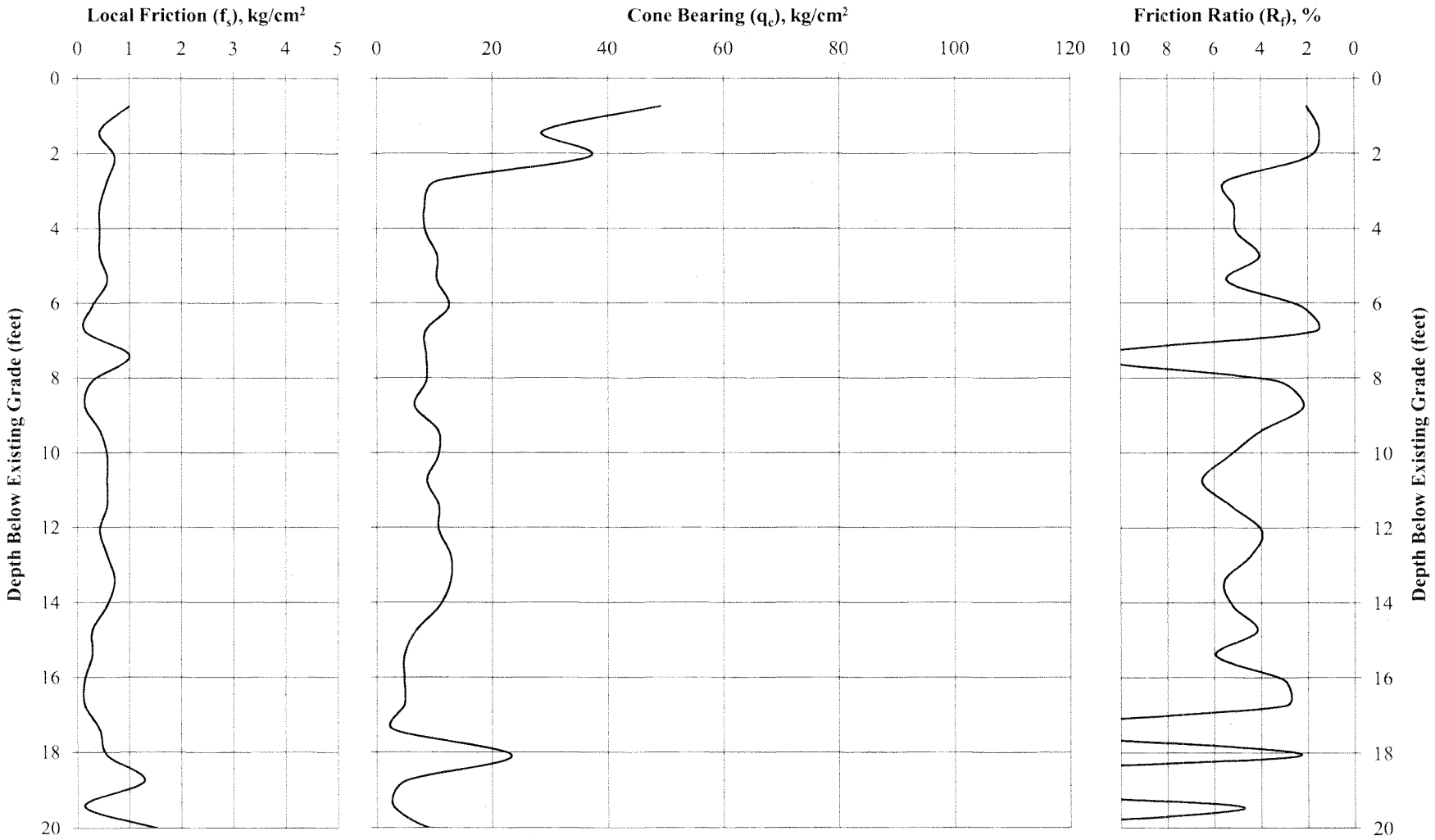

Figure B-29a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-29**
LOCATION: **B-29**
SURFACE ELEVATION: **1151.0 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

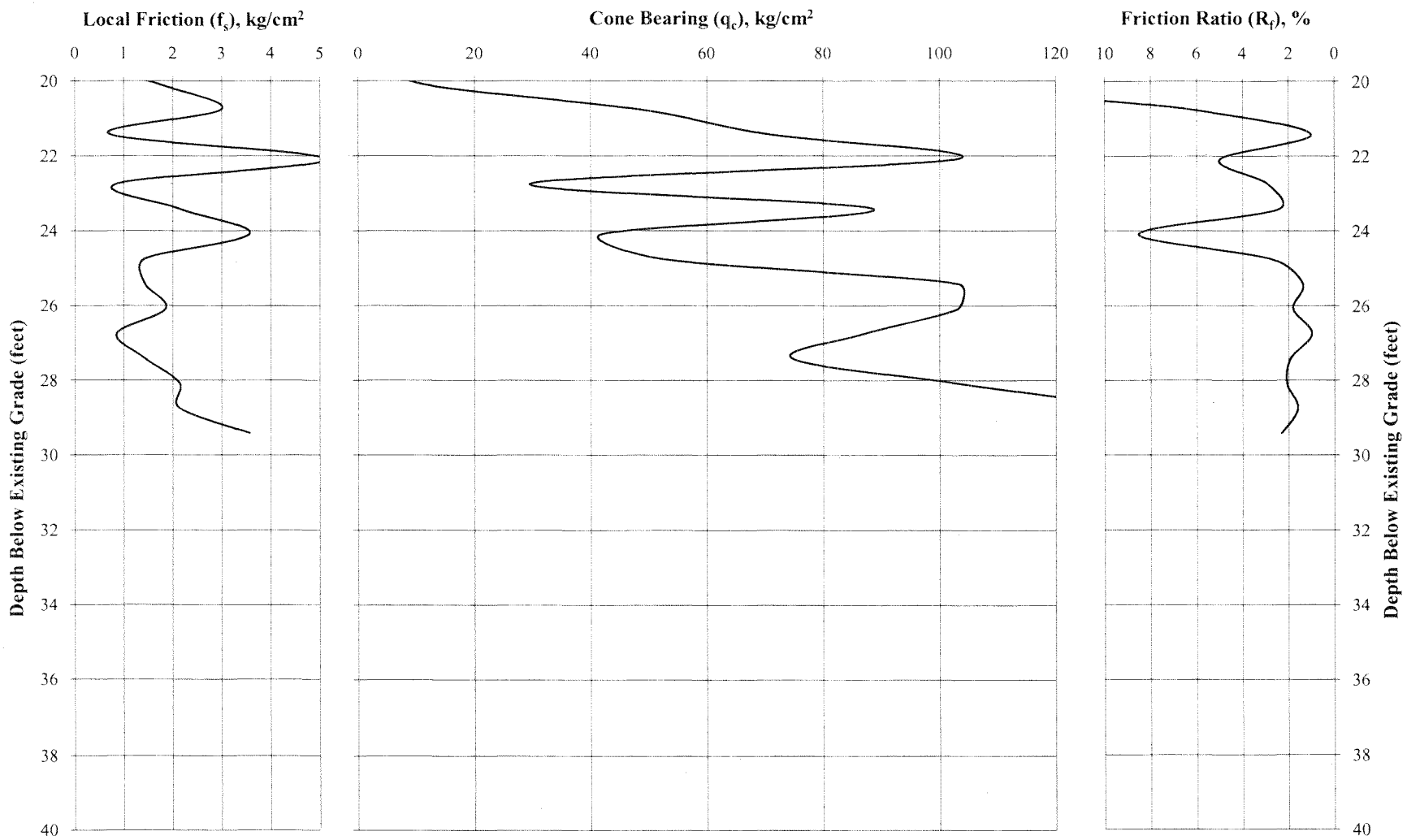

Figure B-29b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-30**
LOCATION: **B-30**
SURFACE ELEVATION: **1148.5 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

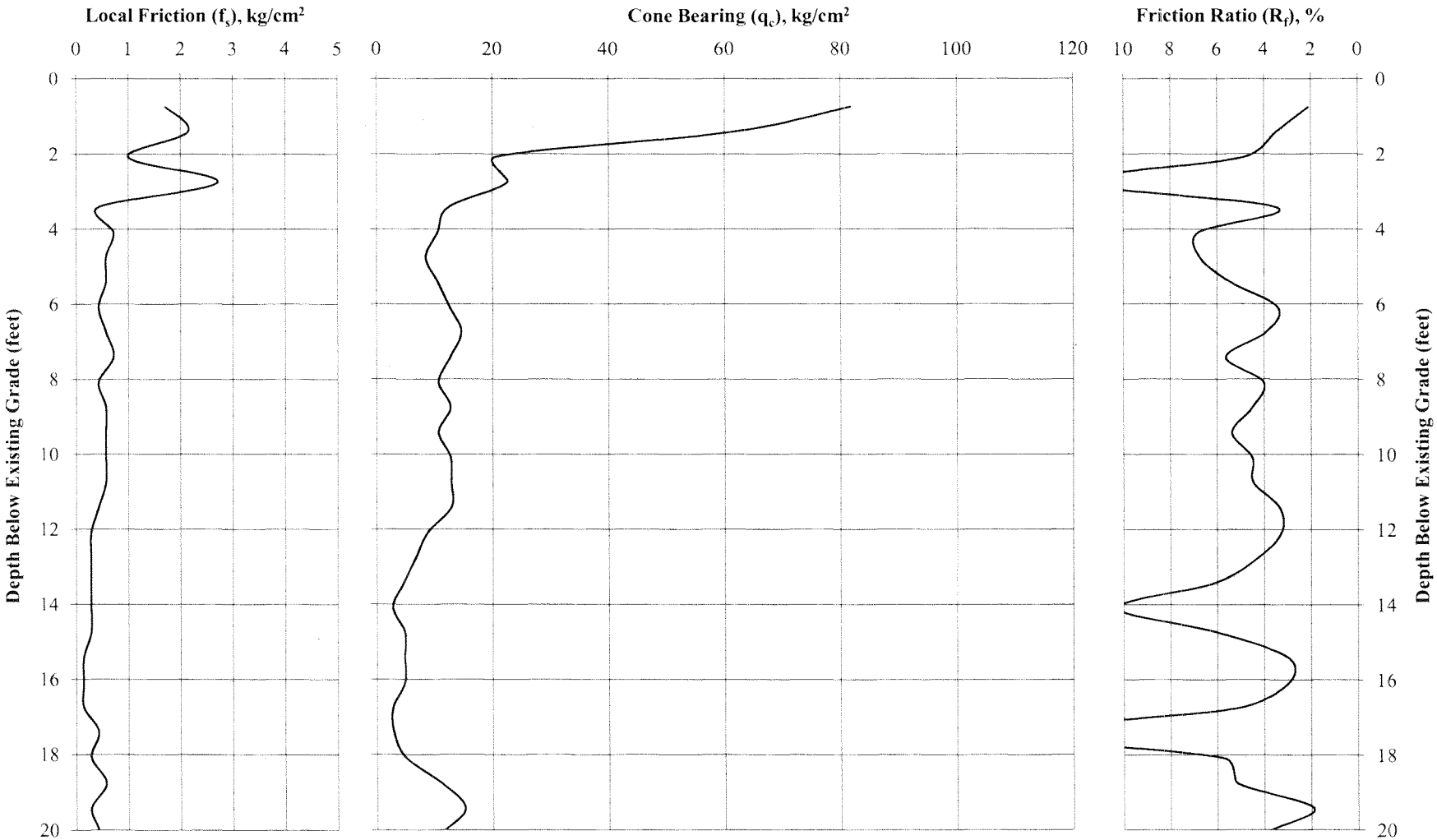

Figure B-30a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-30**
LOCATION: **B-30**
SURFACE ELEVATION: **1148.5 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

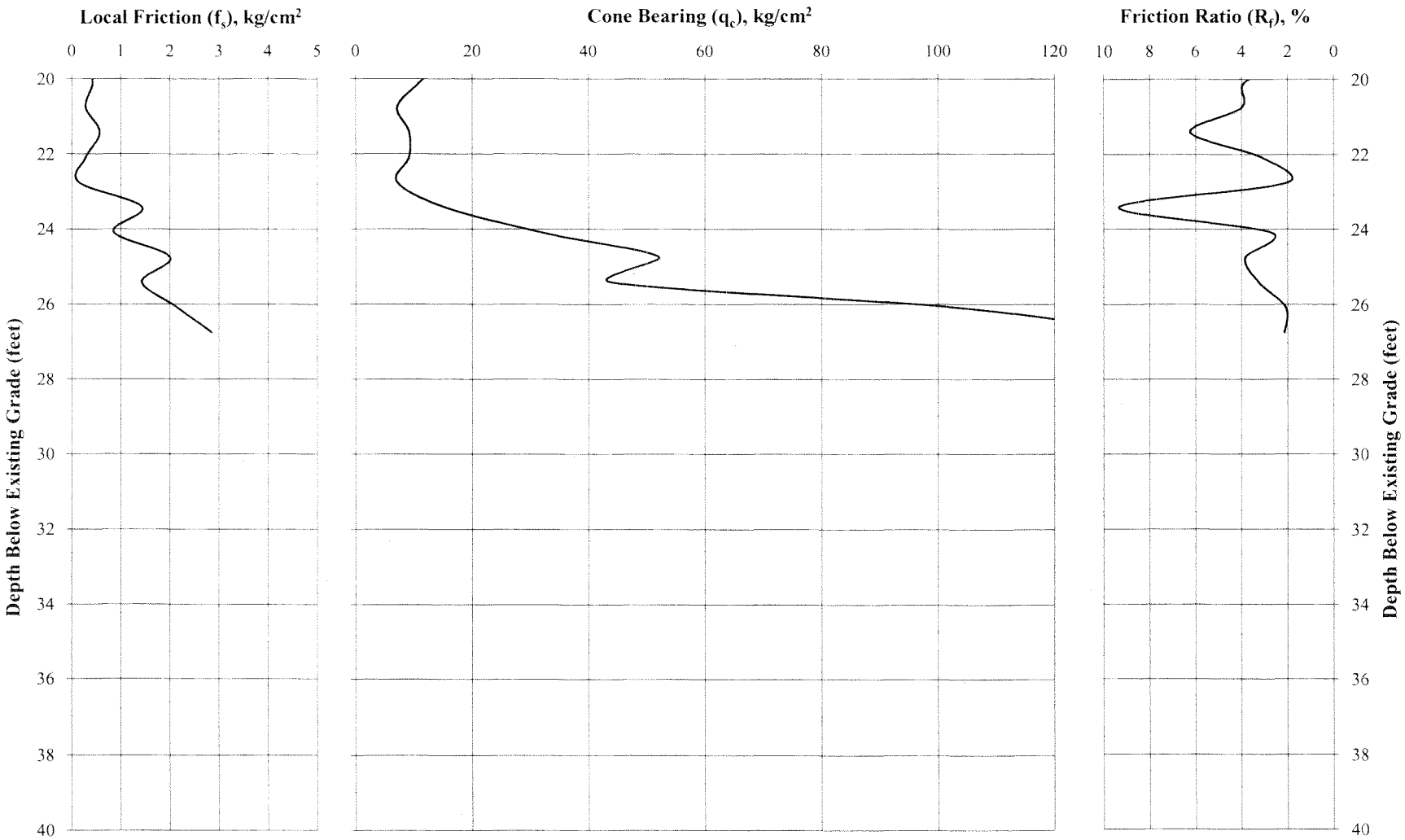

Figure B-30b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-31**
LOCATION: **B-31**
SURFACE ELEVATION: **1148.1 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

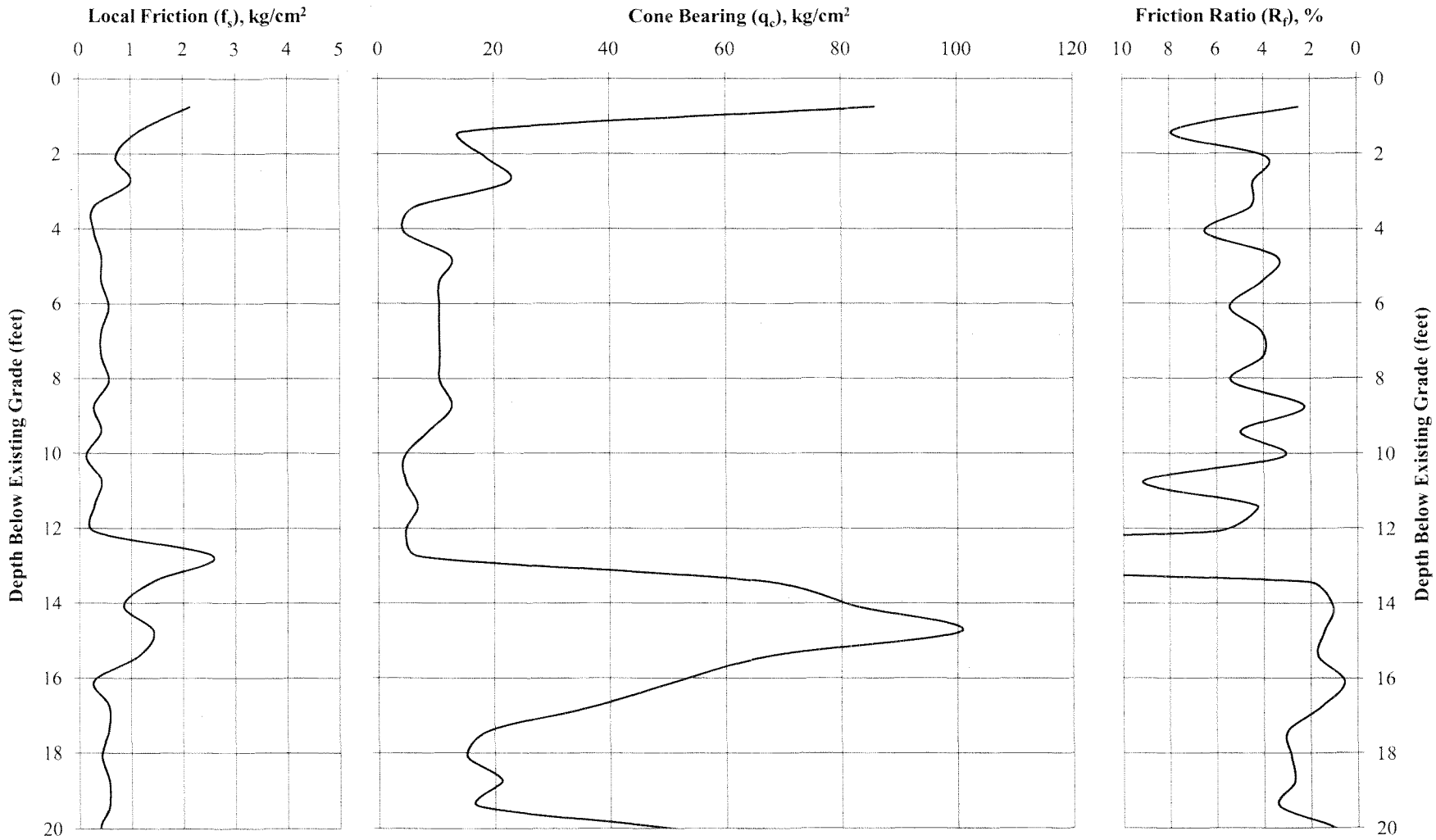

Figure B-31a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-31**
LOCATION: **B-31**
SURFACE ELEVATION: **1148.1 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

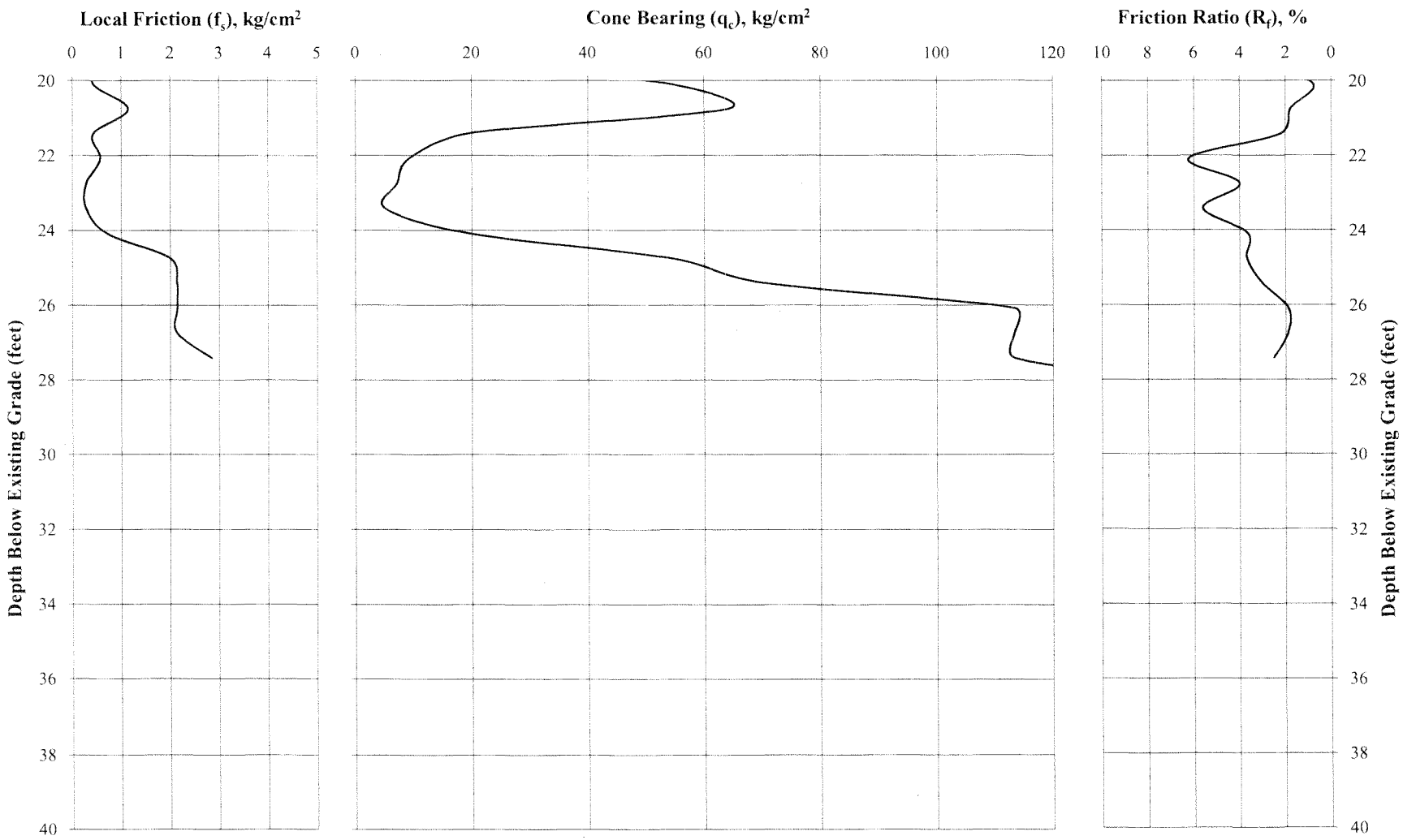

Figure B-31b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-32**
LOCATION: **B-32**
SURFACE ELEVATION: **1148.4 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

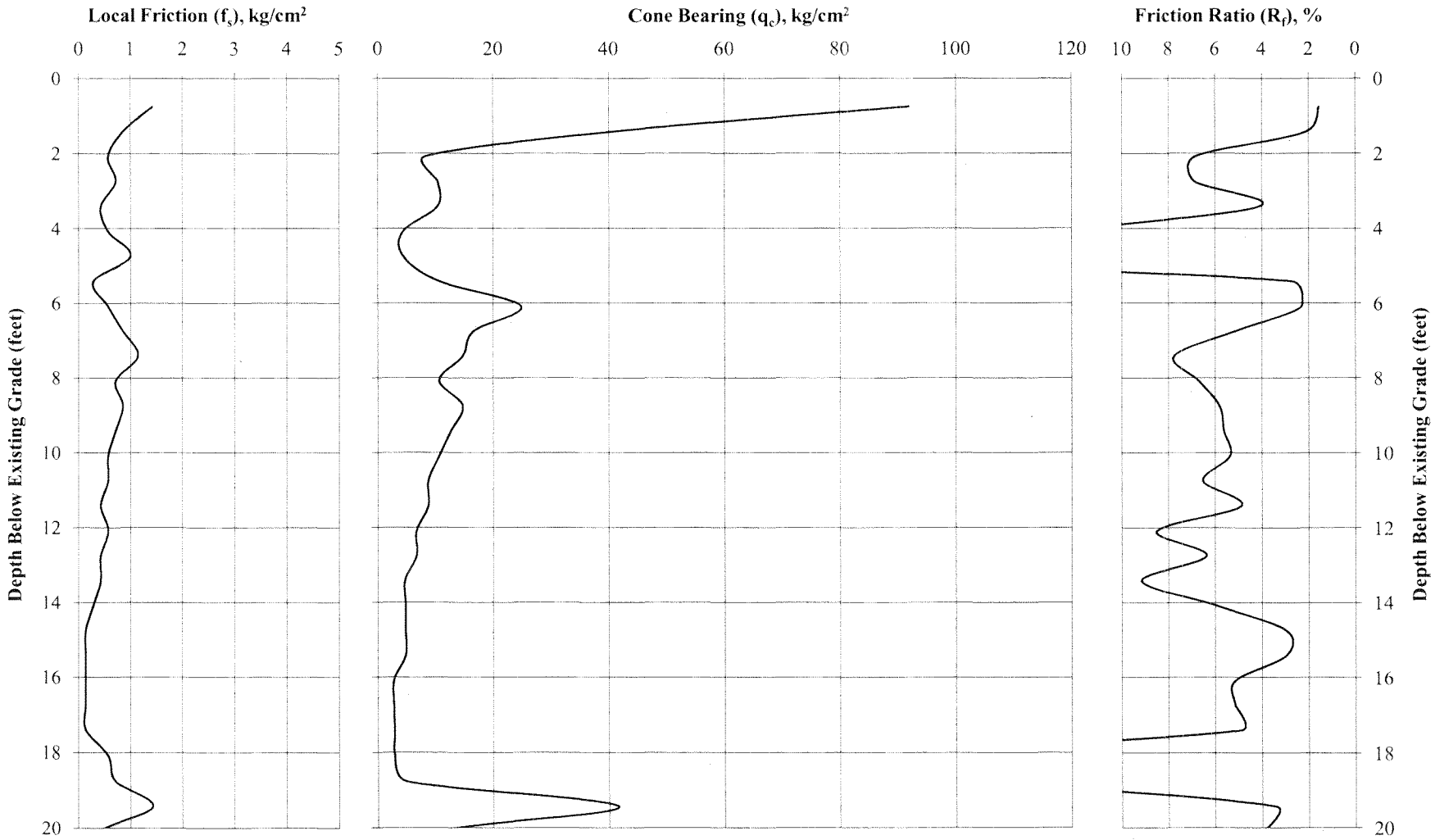

Figure B-32a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-32**
LOCATION: **B-32**
SURFACE ELEVATION: **1148.4 feet**

DATE: **September 28, 2010**
TESTED BY: **CL**
RECORDED BY: **BB**

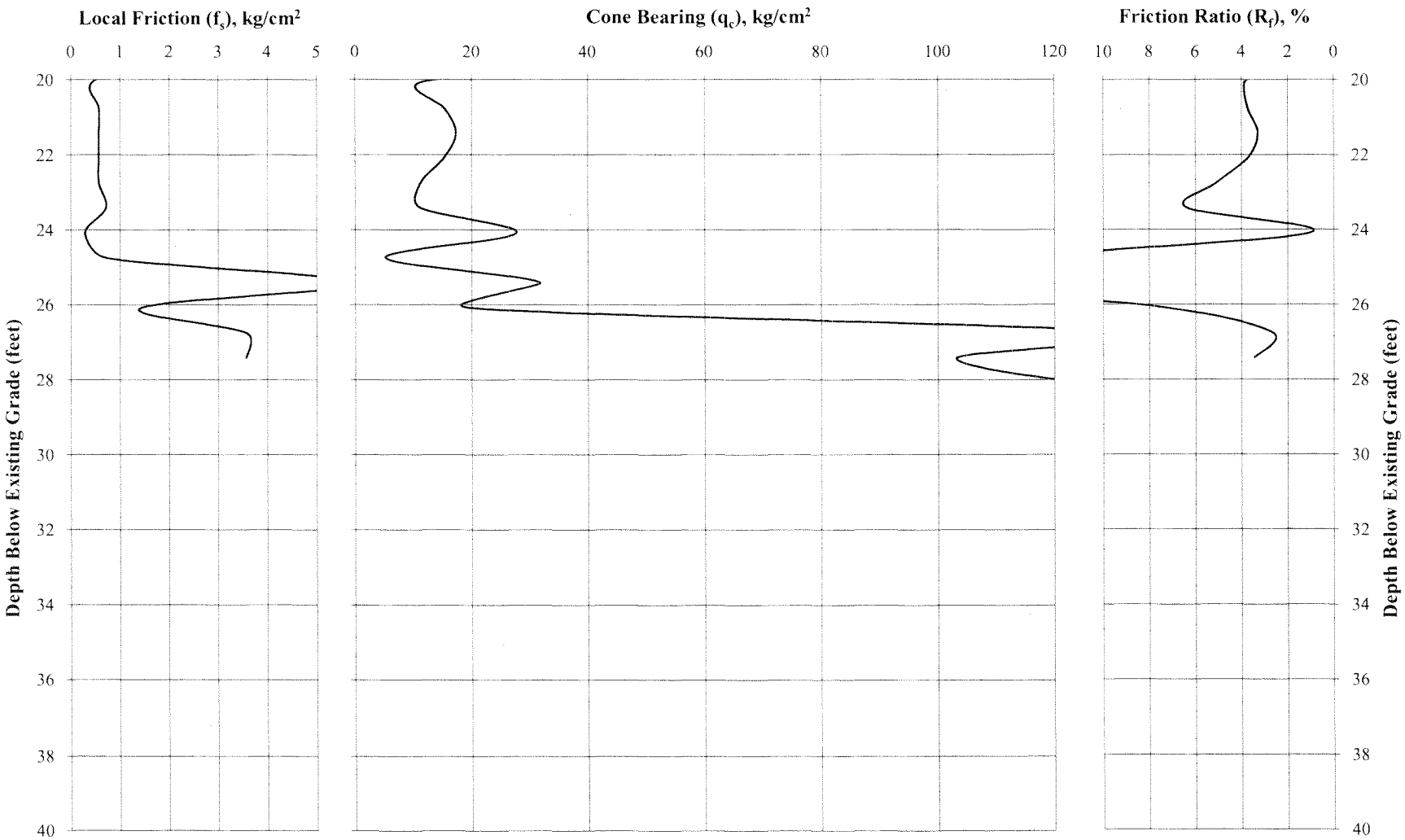

Figure B-32b

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-33**
LOCATION: **B-33**
SURFACE ELEVATION: **1150.1 feet**

DATE: **September 24, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

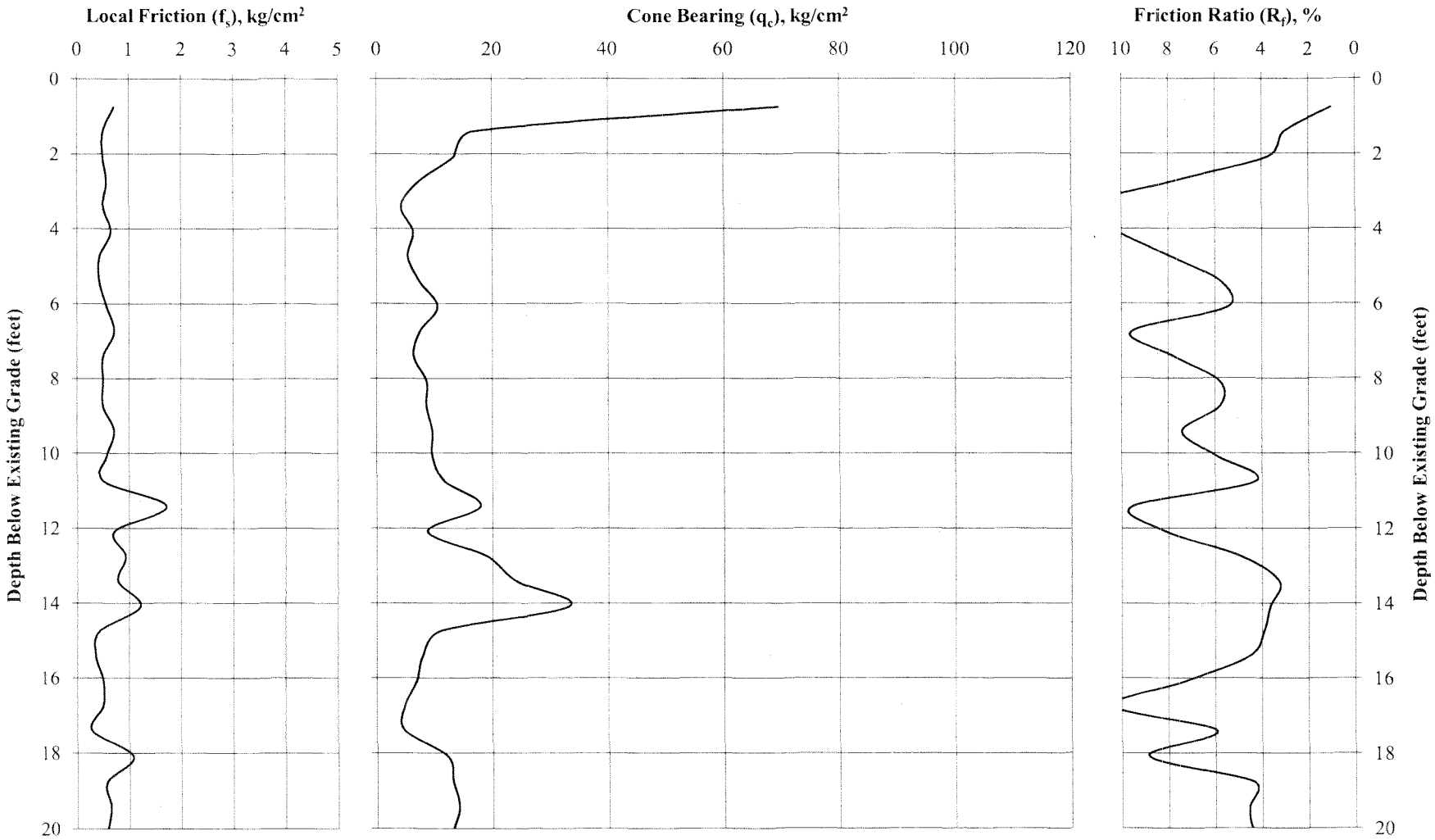

Figure B-33a

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PENETRATION DIAGRAM OF DUTCH FRICTION-CONE PENETROMETER

PROJECT: **West Haymarket Arena**
Lincoln, Nebraska

SOUNDING NO.: **S-33**
LOCATION: **B-33**
SURFACE ELEVATION: **1150.1 feet**

DATE: **September 24, 2010**
TESTED BY: **CL**
RECORDED BY: **GBW**

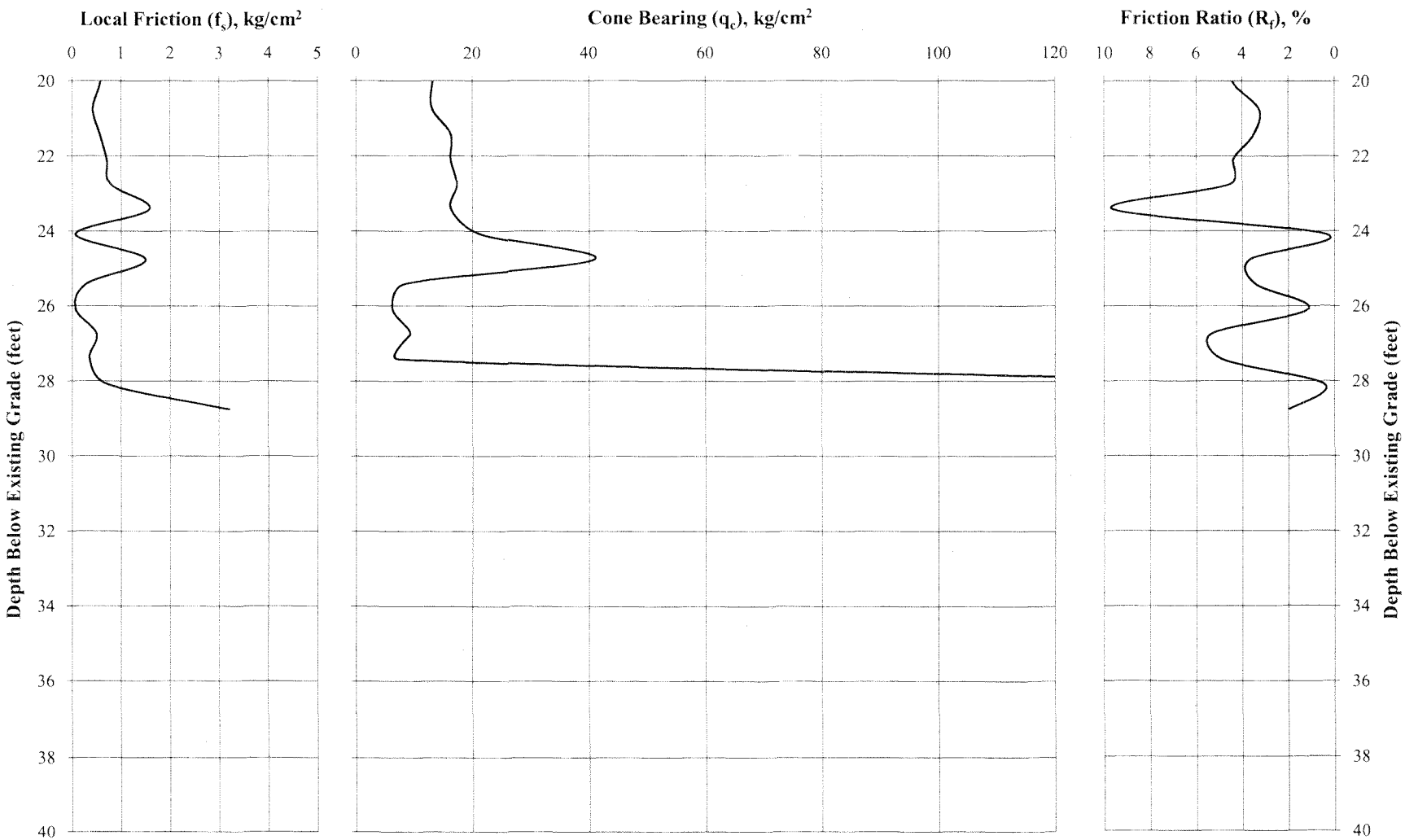

Figure B-33b

APPENDIX C. BORING LOGS

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PROJECT: Lincoln Haymarket Arena
Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: CL & GBW

BORING LOG

BORING No.: B-01

SHEET 1 of 6

DATE: 10-15-2010

WATER LEVELS ▼ 14.0 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1150.9	0.0	CINDERS with Sand; 40-50% fine to coarse sand; 0-5% fine gravel; black; moist; loose. (Fill)						0.0
1149.9	1.0			4				
1149.3	1.6	CL - LEAN CLAY with Sand; 15-25% fine to coarse sand; medium plasticity; brown with black; wet; medium stiff to stiff. (Fill)		3				
		CINDERS with Sand; 40-50% fine to coarse sand; 5-10% fine gravel; black; moist; medium dense. (Fill)		3				
				4				
				(6)				2.5
				1				
				2				
1146.3	4.6			2				
		SC-SM - SILTY, CLAYEY SAND; 60-70% fine sand; medium plasticity; dark brown mottled with dark yellowish brown; wet; loose. (Fill)		2				5.0
				(4)				
				1				
1144.1	6.8			1				
1143.6	7.3	CL - LEAN CLAY; 5-10% fine to coarse sand; medium plasticity; very dark grayish brown with brown; wet; soft. (Fill)		1				
				1				7.5
1142.9	8.0	CL - LEAN CLAY; medium plasticity; very dark gray; wet; soft. (Alluvium)		(2)				
		CL - LEAN CLAY; medium plasticity; very dark gray slightly mottled with dark grayish brown and black; wet; stiff. (Alluvium)			1.5*			
					1.25*			
			1			92.6	28.8	
					1.75*			
1140.9	10.0				1.0*			10.0
		CL - LEAN CLAY; medium plasticity; dark grayish brown mottled with yellowish red; wet; medium stiff. (Alluvium)		1				
1139.9	11.0			2				
		CL - LEAN CLAY; medium plasticity; gray mottled with yellowish red; wet; medium stiff. (Alluvium)		2				
				2				
				(4)				
								12.5
1136.9	14.0 ▼			1				
		ML - SILT; low plasticity; gray; saturated; loose. (Alluvium)		1				
				2				
				2				15.0
				(3)				
1133.9	17.0							
		CL - LEAN CLAY; medium plasticity; dark gray; saturated; soft. (Alluvium)						17.5
				1				
				1				
				1				
1130.9	20.0			(2)				20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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PROJECT: Lincoln Haymarket Arena
Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: CL & GBW

BORING LOG

BORING No.: B-01
SHEET 2 of 6
DATE: 10-15-2010

WATER LEVELS ▼ 14.0 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY; medium plasticity; black; saturated; soft to medium stiff. (Alluvium)	2		0.5* 0.5* 0.5*	95.1	26.9	20.0
1129.5	21.4								
1129.3	21.6		SM - SILTY SAND; 75-85% fine to medium sand; nonplastic; light grayish brown; saturated; medium dense. (Alluvium)						
1129.2	21.7		CL - LEAN CLAY; medium plasticity; dark gray; saturated; soft to medium stiff. (Alluvium)						22.5
1127.4	23.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light grayish brown; saturated; very loose. (Alluvium)						
			SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; light grayish brown; saturated; very loose to loose. (Alluvium)		2 1 2 (3)				25.0
									27.5
1122.4	28.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to medium sand; nonplastic; light grayish brown; saturated; loose; with a trace of coarse sand. (Alluvium)		2 3 3 (6)				30.0
									32.5
1117.4	33.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light grayish brown with light yellowish brown; saturated; medium dense. (Alluvium)		3 6 7 (13)				35.0
									37.5
					3 5 8 (13)				
1110.9	40.0								40.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 1b

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BORING LOG

BORING No.: B-01

DATE: 10-15-2010

WATER LEVELS ▼ 14.0 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light grayish brown with light yellowish brown; saturated; medium dense. (Alluvium)						40.0
									42.5
1107.4	43.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; light brownish gray; saturated; dense; with sand seams. (Alluvium)		3 9 17 (26)				45.0
1104.4	46.5		CL/ML - SILTY CLAY; 30-40% fine sand; low to medium plasticity; grayish brown mottled with yellowish red; saturated; soft to medium stiff; with silt seams. (Alluvium)						47.5
1101.9	49.0				3 6 27 (33)				
1101.4	49.5		ML - SANDY SILT; 40-50% fine sand; low plasticity; grayish brown; saturated; medium dense. (Alluvium)						
			SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)						50.0
									52.5
1097.4	53.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; light brown; saturated; dense; with clay seams. (Alluvium)		9 11 13 (24)				55.0
									57.5
1092.4	58.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light grayish brown; saturated; very dense. (Alluvium)		13 23 33 (56)				
1090.9	60.0								60.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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CREW: CL & GBW

BORING LOG

BORING No.: B-01

SHEET 4 of 6

DATE: 10-15-2010

WATER LEVELS ▼ 14.0 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light grayish brown; saturated; very dense. (Alluvium)						60.0
									62.5
1087.4	63.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		11 12 19 (31)				65.0
									67.5
1082.4	68.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense. (Alluvium)		8 9 9 (18)				70.0
									72.5
					2 3 8 (11)				75.0
									77.5
1072.4	78.5		ML - SANDY SILT; 40-50% fine sand; low plasticity; light brownish gray; saturated; loose; with silty sand seams. (Alluvium)		3 3 3 (6)				
1070.9	80.0								80.0

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BORING LOG

BORING No.: B-01

SHEET 5 of 6

DATE: 10-15-2010

WATER LEVELS ▼ 14.0 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			ML - SANDY SILT; 40-50% fine sand; low plasticity; light brownish gray; saturated; loose; with silty sand seams. (Alluvium)						80.0
1069.4	81.5		Fine to coarse gravel with cobbles. Very rough drilling						
1068.4	82.5		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; light yellowish brown; saturated; very dense. (Alluvium)						82.5
					17 20 21 (41)				85.0
									87.5
1062.4	88.5		SP - POORLY GRADED SAND with Gravel; 15-25% fine to coarse gravel; 70-75% fine to coarse sand; nonplastic; brownish yellow; saturated; dense. (Alluvium)		12 14 11 (25)				90.0
									92.5
1057.9	93.0		SM - SILTY SAND; fine to medium sand; nonplastic; brownish yellow; saturated; very dense. (Dakota Sandstone)		72 28/1" (R)				95.0
1053.4	97.5		THIN IRONSTONE LAYER; 5" thick						97.5
1052.9	98.0		SP-SM - POORLY GRADED SAND with Silt; 0-5% fine to coarse gravel; 85-95% fine to medium sand; nonplastic; brownish yellow; saturated; very dense. (Dakota Sandstone)		60 40/1.5" (R)				
1050.9	100.0								100.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 1e

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CREW: CL & GBW

BORING LOG

BORING No.: B-01

SHEET 6 of 6

DATE: 10-15-2010

WATER LEVELS ▼ 14.0 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 0-5% fine to coarse gravel; 85-95% fine to medium sand; nonplastic; brownish yellow; saturated; very dense. (Dakota Sandstone)						100.0
									102.5
1047.4	103.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; yellowish brown with light yellowish brown and dark brown; saturated; very dense. (Dakota Sandstone)		78 22/1.25" (R)				
1046.8	104.1		Boring Terminated at: 104.1ft						
									105.0
									107.5
									110.0
									112.5
									115.0
									117.5
									120.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 1f

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CREW: CL & GBW

BORING LOG

BORING No.: B-02
SHEET 1 of 6
DATE: 9-29-2010

WATER LEVELS ▽ Cave-in @ 11.5' ▼ 8.3 on 9-3-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1149.8	0.0	CINDERS with Sand; 25-35% fine to coarse sand; 5-10% fine to coarse gravel; 20-30% fines, low plasticity; black; moist; very loose to loose. (Fill)		2 2 1 (3)				0.0
1147.1	2.7	CL - LEAN CLAY with Sand; 0-5% fine gravel; 20-30% fine to coarse sand; medium plasticity; dark grayish brown with black and olive brown; wet; medium stiff. (Fill)						2.5
1145.9	3.9	CL - LEAN CLAY; 0-5% fine gravel; 10-15% fine to coarse sand; medium plasticity; light olive brown with very dark gray and black; wet; medium stiff. (Fill)		1 2 3 (5)				5.0
				2 2 3 (5)				7.5
1141.8	8.0							
1141.5	8.3	CL - LEAN CLAY; medium plasticity; very dark gray with dark greenish gray; wet to saturated; soft. (Fill)						
1140.3	9.5	CL - LEAN CLAY; medium plasticity; very dark gray with dark greenish gray; saturated; soft. (Fill)		1 2 2 (4)				
1139.8	10.0	CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff. (Fill)			1.0*			10.0
1139.1	10.7	CL - LEAN CLAY; 5-15% fine sand; medium plasticity; dark gray with olive and black; saturated; stiff. (Fill)						
1138.3	11.5	ML - SILT; 10-15% fine sand; low plasticity; very dark gray with gray and white; saturated; loose to medium dense. (Alluvium)	3		3.25* 3.0*	98.5	25.2	
		CL - LEAN CLAY; 5-15% fine sand; medium plasticity; very dark gray slightly mottled with white; saturated; very stiff. (Alluvium)			2.5*			12.5
1136.3	13.5	CH - FAT CLAY; high plasticity; dark grayish brown mottled with dark yellowish red slightly mottled with very dark gray; saturated; stiff. (Alluvium)		2 3 4 (7)				15.0
1133.8	16.0	CL - LEAN CLAY; medium plasticity; dark grayish brown slightly mottled with yellowish red and very dark gray; saturated; medium stiff. (Alluvium)		1 2 3 (5)				17.5
1131.8	18.0	CL - LEAN CLAY; medium plasticity; dark gray; saturated; stiff to very stiff. (Alluvium)			1.5* 2.5*	95.3	27.1	
1129.8	20.0		4					20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 2a

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RIG / METHOD: CME 75HT / Hollow-Stem
CREW: CL & GBW

BORING LOG

BORING No.: B-02

DATE: 9-29-2010

WATER LEVELS ▽ Cave-in @ 11.5' ▼ 8.3 on 9-3-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY; medium plasticity; dark olive gray; saturated; stiff. (Alluvium)	4		1.5*			20.0
									22.5
1126.3	23.5		SM - SILTY SAND; 70-80% fine sand; low plasticity; dark gray; saturated; very loose. (Alluvium)		1				
1125.8	24.0				1				
1125.4	24.4		CH - FAT CLAY; high plasticity; dark gray; saturated; soft. (Alluvium)		1				
			CL - LEAN CLAY; medium plasticity; dark gray; saturated; soft; with silt seams. (Alluvium)		(2)				25.0
1123.8	26.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; gray; saturated; very loose. (Alluvium)						27.5
1121.0	28.8		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; gray; saturated; loose. (Alluvium)		2				
					2				
					2				
					(4)				30.0
									32.5
1116.3	33.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light grayish brown; saturated; medium dense. (Alluvium)		2				
					3				
					9				
					(12)				35.0
									37.5
1111.3	38.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; grayish brown with yellowish brown; saturated; medium dense; with abundant clayey sand seams. (Alluvium)		4				
					6				
					12				
1109.8	40.0				(18)				40.0

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CREW: CL & GBW

BORING LOG

BORING No.: B-02
SHEET 3 of 6
DATE: 9-29-2010

WATER LEVELS ▽ Cave-in @ 11.5' ▼ 8.3 on 9-3-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; grayish brown with yellowish brown; saturated; medium dense; with abundant clayey sand seams. (Alluvium)						40.0
									42.5
1106.8	43.0		CL - LEAN CLAY; medium plasticity; grayish brown with very dark grayish brown; saturated; stiff to very stiff; with abundant light grayish brown silt seams; with few very thin silty sand seams; thickly laminated to thinly bedded. (Alluvium)		4 5 6 (11)				45.0
									47.5
1101.3	48.5		CL - LEAN CLAY; medium plasticity; grayish brown heavily mottled with yellowish red; saturated; very stiff. (Alluvium)		8 18 30 (48)				
1100.8	49.0		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light grayish brown; saturated; very dense. (Alluvium)						50.0
									52.5
1096.3	53.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown with light grayish brown; saturated; medium dense; with few clay seams. (Alluvium)		4 7 10 (17)				55.0
									57.5
1091.3	58.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown mottled with yellowish red; saturated; very dense. (Alluvium)		10 12 45 (57)				
1089.8	60.0								60.0

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CREW: CL & GBW

BORING LOG

BORING No.: B-02
SHEET 4 of 6
DATE: 9-29-2010

WATER LEVELS ▽ Cave-in @ 11.5' ▼ 8.3 on 9-3-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown mottled with yellowish red; saturated; very dense. (Alluvium)						60.0
									62.5
1086.3	63.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Alluvium)		10 15 23 (38)				65.0
									67.5
1081.3	68.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense. (Alluvium)		9 10 12 (22)				70.0
									72.5
1076.3	73.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; light yellowish brown with brownish yellow; saturated; medium dense. (Alluvium)		8 10 12 (22)				75.0
									77.5
1071.3	78.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		10 17 21 (38)				
1070.8	79.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Alluvium)						
1069.8	80.0								80.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 2d

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BORING LOG

BORING No.: B-02

SHEET 5 of 6

DATE: 9-29-2010

WATER LEVELS ▽ Cave-in @ 11.5' ▼ 8.3 on 9-3-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; very dense; reworked Dakota grains. (Alluvium)						80.0
									82.5
1066.3	83.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; brownish yellow with light yellowish brown and yellowish red; saturated; medium dense. (Alluvium)		10 10 12 (22)				85.0
									87.5
1061.3	88.5		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; light yellowish brown; saturated; medium dense. (Alluvium)		5 6 7 (13)				90.0
1057.3	92.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Dakota Sandstone)		100/5.5" (R)				92.5
									95.0
									97.5
					100/4.75" (R)				
1049.8	100.0								100.0

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CREW: CL & GBW

BORING LOG

BORING No.: B-02

SHEET 6 of 6

DATE: 9-29-2010

WATER LEVELS ▽ Cave-in @ 11.5' ▼ 8.3 on 9-3-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Dakota Sandstone)						100.0
									102.5
1046.3	103.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown mottled with dark brown; saturated; very dense. (Dakota Sandstone)		84 16/0.5" (R)				
1045.8	104.0		Boring Terminated at: 104.0ft						
									105.0
									107.5
									110.0
									112.5
									115.0
									117.5
									120.0

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Figure C - 2f

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CREW: BB, LI & GBW

BORING LOG

BORING No.: B-03
SHEET 1 of 6
DATE: 10-9-2010

WATER LEVELS ▽ Cave-in @ 22.8' ▼ 7.4 on 10-11-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1144.9	0.0	CL - LEAN CLAY with Sand; 5-10% fine gravel; 15-25% fine to coarse sand; medium plasticity; very dark grayish brown; moist; very stiff. (Fill)						0.0
1144.4	0.5	CL - LEAN CLAY; medium plasticity; very dark gray; wet; medium stiff. (Topsoil)						
1143.5	1.4	CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; medium stiff. (Alluvium)		2 2 3 (5)				2.5
1141.9	3.0	CH - FAT CLAY; high plasticity; very dark gray; wet; medium stiff to stiff. (Alluvium)		1 2 3 3 (5)				
1139.9	5.0	CH - FAT CLAY; high plasticity; black; wet; stiff; with a trace of organics. (Alluvium)	5		1.75* 2.0* 1.75* 2.0*	88.7	31.1	5.0
1137.8	7.1							
1137.5	7.4	CL/CH - LEAN TO FAT CLAY; medium to high plasticity; dark greenish gray mottled with very dark gray; wet to saturated; medium stiff; with strong odor. (Alluvium)		1 2 3 2 (5)				7.5
1136.4	8.5	CL/CH - LEAN TO FAT CLAY; medium to high plasticity; dark greenish gray mottled with very dark gray; saturated; medium stiff; with strong odor. (Alluvium)						
		CL - LEAN CLAY; medium plasticity; dark greenish gray with dark gray; saturated; medium stiff. (Alluvium)						10.0
1133.9	11.0	CL - LEAN CLAY; medium plasticity; greenish gray; saturated; medium stiff. (Alluvium)		1 2 3 2 (5)				12.5
1131.9	13.0	ML - SILT; low plasticity; greenish gray; saturated; very loose. (Alluvium)		1 1 2 2 (3)				
1131.4	13.5	CL/ML - SILTY CLAY; low to medium plasticity; greenish gray with gray; saturated; soft to medium stiff. (Alluvium)						
1130.2	14.7	ML - SILT; low plasticity; greenish gray with gray; saturated; very loose. (Alluvium)						15.0
1127.4	17.5	CL - LEAN CLAY; 5-10% fine sand; low to medium plasticity; dark gray; saturated; soft. (Alluvium)	6		0.3* 0.25* 0.5* 0.25*	86.0	34.2	17.5
1125.4	19.5	CL - LEAN CLAY; medium plasticity; gray; saturated; soft. (Alluvium)						
1124.9	20.0							20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: BB, LI & GBW

BORING LOG

BORING No.: B-03

SHEET 2 of 6

DATE: 10-9-2010

WATER LEVELS ▽ Cave-in @ 22.8' ▼ 7.4 on 10-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY; medium plasticity; gray; saturated; soft. (Alluvium)		1 1 1 (2)				20.0 22.5
1121.9	23.0		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; gray; saturated; medium dense. (Alluvium)		3 6 4 4 (10)				
1120.7	24.2		SM - SILTY SAND; 70-80% fine sand; nonplastic; gray; saturated; medium dense. (Alluvium)						25.0 27.5
1116.9	28.0		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; brown mottled with dark yellowish brown; saturated; medium dense. (Alluvium)		4 8 11 (19)				30.0 32.5
1111.9	33.0		SP - POORLY GRADED SAND; same as above except with silty sand seams. (Alluvium)		3 7 12 (19)				
1110.9	34.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to coarse sand; nonplastic; very pale brown; saturated; dense; with silty sand seams. (Alluvium)						35.0
1108.4	36.5		CL - SANDY LEAN CLAY; 30-40% fine sand; medium plasticity; grayish brown with brown heavily mottled with yellowish red; saturated; stiff. (Alluvium)						37.5
1106.9	38.0		SC - CLAYEY SAND; 50-60% fine sand; medium plasticity; brown mottled with yellowish red; saturated; medium dense. (Alluvium)		2 11 7 (18)				
1106.4	38.5		SM - SILTY SAND; 75-85% fine sand; low plasticity; very pale brown mottled with yellowish red; saturated; medium dense. (Alluvium)						
1104.9	40.0								40.0

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Figure C - 3b

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BORING LOG

BORING No.: B-03
SHEET 3 of 6
DATE: 10-9-2010

WATER LEVELS ▽ Cave-in @ 22.8' ▼ 7.4 on 10-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine sand; low plasticity; very pale brown mottled with yellowish red; saturated; medium dense. (Alluvium)						40.0
									42.5
1101.9	43.0		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)		3 8 10 (18)				
									45.0
									47.5
1096.9	48.0		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		6 14 17 (31)				
									50.0
									52.5
1091.9	53.0		SP - POORLY GRADED SAND; 10-15% fine gravel; 80-85% fine to coarse sand; nonplastic; yellowish brown mottled with yellowish red; saturated; dense. (Alluvium)		4 10 14 (24)				
									55.0
1088.9	56.0		SM - SILTY SAND; 70-80% fine sand; nonplastic; brown; saturated; dense. (Alluvium)						
									57.5
1085.9	59.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		11 17 14 (31)				
1084.9	60.0								60.0

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BORING LOG

BORING No.: B-03
SHEET 4 of 6
DATE: 10-9-2010

WATER LEVELS ▽ Cave-in @ 22.8' ▼ 7.4 on 10-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)						60.0
1083.4	61.5		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)						62.5
					5 6 9 (15)				65.0
1076.9	68.0		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense. (Alluvium)		3 6 10 (16)				67.5 70.0
1071.9	73.0		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; brownish yellow; saturated; dense. (Alluvium)		5 12 18 (30)				72.5 75.0
1067.9	77.0		CL - LEAN CLAY; medium plasticity; gray slightly mottled with dark reddish brown; saturated; stiff. (Alluvium)		2 5 7 8 (12)				77.5
1065.9	79.0		SP - POORLY GRADED SAND with Gravel; 15-20% fine to coarse gravel; 75-80% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense. (Alluvium)						
1064.9	80.0								80.0

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BORING No.: B-03

SHEET 5 of 6

DATE: 10-9-2010

WATER LEVELS ▽ Cave-in @ 22.8' ▼ 7.4 on 10-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND with Gravel; 15-20% fine to coarse gravel; 75-80% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense. (Alluvium)						80.0
									82.5
1061.9	83.0		SW - WELL-GRADED SAND with Gravel; 20-30% fine to coarse gravel; 60-70% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense. (Alluvium)		4 5 5 9 (10)				
									85.0
1057.9	87.0		SP-SM - POORLY GRADED SAND with Silt; 0-5% fine to coarse gravel; 80-90% fine to coarse sand; nonplastic; dark yellowish brown with brownish yellow; saturated; dense. (Alluvium)						87.5
1056.4	88.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; yellowish brown; saturated; very dense. (Dakota Sandstone)		12 65 23/0.75" 100/4" (R)				
									90.0
									92.5
1051.9	93.0		SP - POORLY GRADED SAND; 90-95% fine to medium sand; nonplastic; yellowish brown with brownish yellow; saturated; very dense; with a trace of coarse sand; with a trace of ironstone gravel. (Dakota Sandstone)		65 35/2.75" (R)				
									95.0
									97.5
1046.9	98.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)		100/3.75" (R)				
1044.9	100.0								100.0

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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Figure C - 3e

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BORING LOG

BORING No.: B-03

SHEET 6 of 6

DATE: 10-9-2010

WATER LEVELS ▽ Cave-in @ 22.8' ▼ 7.4 on 10-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						100.0
									102.5
1041.6	103.3				100/4" (R)				
			Boring Terminated at: 103.3ft						
									105.0
									107.5
									110.0
									112.5
									115.0
									117.5
									120.0

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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Figure C - 3f

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CREW: GW

BORING LOG

BORING No.: B-03A

SHEET 1 of 1

DATE: 12-3-2010

WATER LEVELS ▽ Groundwater was 0.2 feet above ground surface.

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	qu (tsf)	DEPTH (feet)
1142.7	0.0		SC - CLAYEY SAND; 50-60% fine to coarse sand; very dark gray; saturated; very loose. (Modern Alluvium)			0.0
1142.4	0.3		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; very soft. (Modern Alluvium)		1.0*	
1142.0	0.7		CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff to stiff. (Alluvium)		2.2*	
1141.3	1.4		CH - FAT CLAY; same as above except very stiff. (Alluvium)			2.5
					2.8*	
1137.7	5.0		Boring Terminated at: 5.0ft			5.0
						7.5
						10.0
						12.5
						15.0
						17.5
						20.0

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CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-04

SHEET 1 of 5

DATE: 11-12-2010

WATER LEVELS ▼ 8.4 on 11-12-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DEPTH (feet)
1145.3	0.0	CL - LEAN CLAY; 10-15% fine to coarse sand; medium plasticity; very dark grayish brown; moist; hard. (Fill)			0.0
1144.8	0.5	CL - LEAN CLAY; 10-15% fine to coarse sand; medium plasticity; very dark grayish brown; wet; medium stiff to stiff. (Fill)		3 3 5 4 (8)	
1143.9	1.4	CL - SANDY LEAN CLAY; 35-45% fine sand; medium plasticity; very dark grayish brown; moist; stiff. (Topsoil)			2.5
1142.3	3.0	SC - CLAYEY SAND; 55-65% fine sand; medium plasticity; dark yellowish brown; wet; medium dense. (Alluvium)		2 4 5 7 (9)	
1141.3	4.0	SC-SM - SILTY, CLAYEY SAND; 60-70% fine sand; low to medium plasticity; dark yellowish brown mottled with white; moist; medium dense. (Alluvium)			5.0
1140.3	5.0	SM - SILTY SAND; 70-80% fine sand; low plasticity; yellowish brown; moist; medium dense. (Alluvium)			
1139.3	6.0	SM - SILTY SAND; 75-85% fine sand; nonplastic; grayish brown; wet; loose. (Alluvium)		3 3 3 2 (6)	
1138.3	7.0	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale brown mottled with yellowish brown; wet; loose. (Alluvium)			7.5
1137.3	8.0	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brown; saturated; very loose. (Alluvium)		1 1 1 1 (2)	
1136.8	8.5	SM - SILTY SAND; 75-85% fine sand; nonplastic; brown; saturated; very loose. (Alluvium)			10.0
1133.3	12.0	SP-SM - POORLY GRADED SAND with Silt; 75-85% fine sand; nonplastic; pale brown; saturated; medium dense. (Alluvium)		3 8 8 10 (16)	12.5
1131.8	13.5	SM - SILTY SAND; 75-85% fine sand; nonplastic; brown; saturated; medium dense. (Alluvium)		5 9 10 11 (19)	15.0
1129.3	16.0	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale brown; saturated; dense. (Alluvium)		11 13 15 (28)	17.5
1126.8	18.5	SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; pale brown; saturated; medium dense. (Alluvium)		5 10 12 (22)	
1125.8	19.5	SP - POORLY GRADED SAND; 95-100% fine to coarse sand; pale brown; saturated; dense. (Alluvium)			20.0
1125.3	20.0				

Figure C - 5a

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CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-04

SHEET 2 of 5

DATE: 11-12-2010

WATER LEVELS ▼ 8.4 on 11-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DEPTH (feet)
			SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; pale brown; saturated; dense. (Alluvium)			20.0
						22.5
1121.8	23.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; pale brown; saturated; medium dense. (Alluvium)		5 9 12 (21)	25.0
1117.8	27.5		CH - FAT CLAY; high plasticity; dark grayish brown heavily mottled with dark yellowish red and olive brown; saturated; medium stiff to stiff. (Alluvium)			27.5
1116.4	28.9		CL - LEAN CLAY; medium plasticity; dark gray heavily mottled with very dark gray; saturated; medium stiff to stiff. (Alluvium)		2 3 3 (6)	30.0
						32.5
1111.8	33.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; yellowish red with yellowish brown; saturated; dense. (Alluvium)		7 16 18 (34)	35.0
1107.8	37.5		SC-SM - SILTY, CLAYEY SAND; 60-70% fine sand; low to medium plasticity; grayish brown mottled with yellowish red and brown; saturated; medium dense. (Alluvium)			37.5
1106.1	39.2		SM - SILTY SAND; 70-80% fine sand; nonplastic; grayish brown with yellowish brown mottled with dark grayish brown and yellowish red; saturated; medium dense. (Alluvium)		3 12 10 (22)	40.0
1105.3	40.0					

Figure C - 5b

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BORING LOG

BORING No.: B-04

SHEET 3 of 5

DATE: 11-12-2010

WATER LEVELS ▼ 8.4 on 11-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DEPTH (feet)
			SM - SILTY SAND; 70-80% fine sand; nonplastic; grayish brown with yellowish brown mottled with dark grayish brown and yellowish red; saturated; medium dense. (Alluvium)			40.0
						42.5
1101.8	43.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		5 11 15 (26)	45.0
						47.5
1096.8	48.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; light grayish brown; saturated; medium dense. (Alluvium)		8 9 13 (22)	50.0
						52.5
					6 5 6 (11)	55.0
1088.8	56.5		SC-SM - SILTY, CLAYEY SAND; 60-70% fine sand; low to medium plasticity; grayish brown heavily mottled with yellowish red and brown; saturated; dense. (Alluvium)			57.5
1086.5	58.8		SM - SILTY SAND; 75-85% fine sand; low plasticity; yellowish brown; saturated; dense. (Alluvium)		10 15 17 (32)	
1085.7	59.6					
1085.3	60.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; yellowish brown;			60.0

Figure C - 5c

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CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-04

SHEET 4 of 5

DATE: 11-12-2010

WATER LEVELS ▼ 8.4 on 11-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DEPTH (feet)
			saturated; dense. (Alluvium)			60.0
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; yellowish brown; saturated; dense. (Alluvium)			62.5
1081.8	63.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; light grayish brown; saturated; dense. (Alluvium)		8 16 18 (34)	65.0
						67.5
1076.8	68.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)		5 8 12 (20)	70.0
1074.3	71.0		ML - SILT; 10-15% fine sand; nonplastic; light brownish gray slightly mottled with yellowish red; saturated; dense. (Alluvium)			72.5
1071.4	73.9		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown slightly mottled with yellowish red; saturated; very dense. (Alluvium)		7 15 28 (43)	75.0
						77.5
1066.8	78.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; brownish yellow; saturated; dense. (Alluvium)		6 17 19 (36)	
1065.3	80.0					80.0

Figure C - 5d

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BORING No.: B-04

SHEET 5 of 5

DATE: 11-12-2010

WATER LEVELS ▼ 8.4 on 11-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DEPTH (feet)
			SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; brownish yellow; saturated; dense. (Alluvium)			80.0
						82.5
1061.8	83.5		SP - POORLY GRADED SAND with Gravel; 15-20% fine to coarse gravel; 75-80% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense. (Alluvium)		8 8 8 8 (16)	85.0
1059.3	86.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; brownish yellow; saturated; very dense; with a trace of medium sand. (Dakota Sandstone)			87.5
					86 14/0.25" (R)	
						90.0
						92.5
1051.8	93.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; brownish yellow with dark yellowish brown; saturated; very dense; with a trace of thin layers of ironstone 1/8" thick. (Dakota Sandstone)		100/7" (R)	
						95.0
						97.5
1046.8	98.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)		100/6" (R)	
1046.3	99.0		Boring Terminated at: 99.0ft			100.0

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

Figure C - 5e

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CREW: GW

BORING LOG

BORING No.: B-04A

SHEET 1 of 1

DATE: 12-3-2010

WATER LEVELS ▼ 0.9 IAD

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	DEPTH (feet)
1142.4	0.0		SM - SILTY SAND; 75-85% fine to coarse sand; very dark grayish brown; wet to saturated; very loose. (Modern Alluvium)		0.0
1141.9	0.5		ML - SILT with Sand; 20-30% fine to coarse sand; low plasticity; very dark gray; saturated; very loose; with abundant organics. (Modern Alluvium)		
1140.1	2.3		SC - CLAYEY SAND; 60-70% fine sand; dark yellowish brown with very dark gray; saturated; loose. (Alluvium)		2.5
1139.6	2.8		SC-SM - SILTY, CLAYEY SAND; 60-70% fine sand; yellowish brown with dark brown; saturated; loose to medium dense. (Alluvium)		
1138.9	3.5		SM - SILTY SAND; 70-80% fine sand; yellowish brown; saturated; loose to medium dense. (Alluvium)		
1137.4	5.0		Boring Terminated at: 5.0ft		5.0
					7.5
					10.0
					12.5
					15.0
					17.5
					20.0

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PROJECT: Lincoln Haymarket Arena
Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: BB, LI & GBW

BORING LOG

BORING No.: B-05

SHEET 1 of 5

DATE: 10-13-2010

WATER LEVELS ▽ Cave-in @ 20.5' ▼ 13.0 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1150.9	0.0		SC-SM - SILTY, CLAYEY SAND with Gravel; 20-30% fine to coarse gravel; 50-60% fine to coarse sand; 15-20% fines, low to medium plasticity; very dark grayish brown; moist; medium dense; with cinders. (Fill)						0.0
1150.2	0.7				5				
1149.6	1.3		CINDERS with Gravel; 30-40% fine to coarse gravel; 10-20% fines, low plasticity; black; moist to wet; loose. (Fill)		5				
					2				
			SC - CLAYEY SAND; 0-5% fine gravel; 60-70% fine to coarse sand; medium plasticity; very dark grayish brown with black; wet; medium stiff to stiff. (Fill)		4				
1148.4	2.5				(7)				2.5
1147.9	3.0		CL - SANDY LEAN CLAY; 35-45% fine to coarse sand; medium plasticity; very dark gray; wet; soft. (Fill)						
1147.6	3.3		SM - SILTY SAND; 5-10% fine to coarse gravel; 70-80% fine to coarse sand; nonplastic; black; wet; loose; with cinders and brick rubble. (Fill)			0.75*	90.1	34.4	
1146.8	4.1		CL - LEAN CLAY with Sand; 20-30% fine to medium sand; medium plasticity; dark olive brown with black and dark yellowish brown; wet; medium stiff. (Fill)	7		0.75*			
1145.9	5.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; very dark gray; wet; medium stiff. (Alluvium)			0.75*			5.0
1144.9	6.0		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; very dark grayish brown; wet; soft. (Alluvium)		1				
			CL - SANDY LEAN CLAY; 30-40% fine sand; medium plasticity; very dark gray; wet; soft to medium stiff. (Alluvium)		1				
					2				
					1				
					(3)				7.5
1142.9	8.0		CL - SANDY LEAN CLAY; 40-50% fine to medium sand; medium plasticity; very dark gray mottled with dark yellowish red; wet; medium stiff to stiff. (Alluvium)						
					1				
					3				
1141.4	9.5		SC - CLAYEY SAND; 50-60% fine to medium sand; medium plasticity; gray heavily mottled with yellowish red and very dark gray; wet; loose. (Alluvium)		3				
					4				10.0
					(6)				
1139.9	11.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; brownish gray slightly mottled with yellowish red; wet; medium dense. (Alluvium)		2				
					4				
1138.7	12.2				4				
			SM - SILTY SAND; 75-85% fine sand; nonplastic; brownish gray slightly mottled with yellowish red; wet to saturated; medium dense. (Alluvium)		5				12.5
1137.9	13.0 ▼				(8)				
			SM - SILTY SAND; 75-85% fine sand; nonplastic; brownish gray slightly mottled with yellowish red; saturated; medium dense. (Alluvium)						
1136.9	14.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light grayish brown; saturated; medium dense. (Alluvium)		2				
					5				
					4				
					4				15.0
					(9)				
									17.5
1132.4	18.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown with light grayish brown heavily mottled with yellowish red; saturated; medium dense; with silty sand seams. (Alluvium)		4				
					3				
					5				
1130.9	20.0				(8)				20.0

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LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: BB, LI & GBW

BORING LOG

BORING No.: B-05

SHEET 2 of 5

DATE: 10-13-2010

WATER LEVELS ▽ Cave-in @ 20.5' ▼ 13.0 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown with light grayish brown heavily mottled with yellowish red; saturated; medium dense. (Alluvium)						20.0
1128.4	22.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; brown; saturated; medium dense; with a trace of coarse sand. (Alluvium)						22.5
					6 8 12 (20)				25.0
									27.5
1122.4	28.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; very pale brown with yellowish brown; saturated; dense. (Alluvium)		10 15 20 (35)				30.0
1119.9	31.0		CL - LEAN CLAY; medium plasticity; light olive brown mottled with yellowish red and black; saturated; stiff. (Alluvium)						32.5
1117.9	33.0		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light brownish gray slightly mottled with yellowish red; saturated; very dense. (Alluvium)		13 18 20 (38)				35.0
									37.5
1111.9	39.0		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light brownish gray slightly mottled with yellowish red; saturated; dense. (Alluvium)		7 17 18 (35)				40.0
1110.9	40.0								

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SHEET 3 of 5

DATE: 10-13-2010

WATER LEVELS ▽ Cave-in @ 20.5' ▼ 13.0 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light brownish gray slightly mottled with yellowish red; saturated; dense. (Alluvium)						40.0
1108.4	42.5		CH - FAT CLAY; high plasticity; brown with light grayish brown and dark gray; saturated; very stiff; with abundant silt seams. (Alluvium)						42.5
1106.9	44.0		CH - FAT CLAY; high plasticity; very dark gray with very dark grayish brown and gray and light grayish brown, mottled with yellowish red; saturated; stiff; with abundant silt and sandy silt seams. (Alluvium)		3 4 5 (9)				45.0
1104.4	46.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; light brownish gray heavily mottled with yellowish red; saturated; medium dense to dense; with silt seams. (Alluvium)						47.5
1101.4	49.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; very pale brown mottled with yellowish red; saturated; dense; with silt and clay seams and silty sand seams. (Alluvium)		4 13 15 (28)				50.0
									52.5
1097.4	53.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		7 16 19 (35)				55.0
									57.5
1092.4	58.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; pale brown with yellowish brown; saturated; medium dense. (Alluvium)		7 8 4				
1091.4	59.5		SC - CLAYEY SAND; 50-60% fine to coarse sand; nonplastic; dark grayish						
1090.9	60.0								60.0

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SHEET 4 of 5

DATE: 10-13-2010

WATER LEVELS ▽ Cave-in @ 20.5' ▼ 13.0 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			brown; saturated; loose. (Alluvium)						60.0
			SC - CLAYEY SAND; 50-60% fine to coarse sand; dark grayish brown; saturated; loose. (Alluvium)		3 (12)				
1088.9	62.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; brown with yellowish brown; saturated; dense; with clayey sand seams. (Alluvium)						62.5
					19 21 16 (37)				65.0
1083.9	67.0		SP - POORLY GRADED SAND; 10-15% fine gravel; 80-85% fine to coarse sand; nonplastic; yellowish brown; saturated; dense. (Alluvium)						67.5
					7 12 15 (27)				70.0
									72.5
1077.4	73.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		9 12 13 (25)				75.0
									77.5
1072.4	78.5		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; light yellowish brown; saturated; very dense. (Alluvium)		15 29 35 (64)				
1070.9	80.0								80.0

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SHEET 5 of 5

DATE: 10-13-2010

WATER LEVELS ▽ Cave-in @ 20.5' ▼ 13.0 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; light yellowish brown; saturated; very dense. (Alluvium)						80.0
									82.5
1067.9	83.0		ML - SANDY SILT; 40-50% fine sand; low plasticity; very pale brown; saturated; loose. (Alluvium)		2 3 13 (16)				
1066.4	84.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)						85.0
									87.5
1062.4	88.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; yellowish brown with brownish yellow; saturated; medium dense. (Alluvium)						
1061.4	89.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Dakota Sandstone)		100/8.5" (R) 100/5" (R)				90.0
									92.5
1057.4	93.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; brownish yellow; saturated; very dense. (Dakota Sandstone)		100/3.5" (R)				
									95.0
									97.5
1052.4	98.5		Boring Terminated at: 98.5ft						100.0

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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CREW: CL & GBW

BORING LOG

BORING No.: B-06

SHEET 1 of 6

DATE: 10-5-2010

WATER LEVELS ▼ 12.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1151.1	0.0		CINDERS with Sand; 30-40% fine to coarse sand; 5-10% fine to coarse gravel; 20-30% fines, low plasticity; black; moist; loose. (Fill)		2 2 4 5 (6)				0.0
1148.7	2.4								
1148.3	2.8		SM - SILTY SAND; 75-85% fine sand; low plasticity; yellowish brown; moist; medium dense. (Fill)						2.5
			CL - LEAN CLAY; 5-10% fine to coarse sand; medium plasticity; very dark grayish brown with yellowish brown; wet; medium stiff to stiff. (Fill)		2 3 4 3 (7)				
1146.8	4.3		CL - LEAN CLAY; 0-5% fine to coarse sand; medium plasticity; light olive brown with very dark gray; wet; stiff. (Fill)						5.0
1144.6	6.5				2 1 2 3 (3)				
1144.1	7.0		CL/ML - SILTY CLAY; low to medium plasticity; dark grayish brown with grayish brown; wet; soft to medium stiff; with silt seams. (Alluvium)						
			CL - LEAN CLAY; medium plasticity; dark grayish brown; wet; medium stiff to stiff. (Alluvium)						7.5
1142.8	8.3		CL - LEAN CLAY; medium plasticity; very dark gray; wet; medium stiff. (Alluvium)		1 2 2 (4)				
1141.1	10.0					1.25*			10.0
1140.5	10.6		CL - LEAN CLAY; medium plasticity; very dark gray slightly mottled with dark grayish brown; wet; stiff. (Alluvium)	8		1.0*	93.0	28.8	
			CL - LEAN CLAY; medium plasticity; very dark gray slightly mottled with dark grayish brown; wet; medium stiff to stiff. (Alluvium)			0.75*			
1139.1	12.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; saturated; soft. (Alluvium)		0 1 1 (2)				12.5
1137.6	13.5		ML - SILT; low plasticity; dark grayish brown; saturated; loose. (Alluvium)		2 2 2 (4)				15.0
1133.6	17.5		CL/ML - SILTY CLAY; low to medium plasticity; dark gray; saturated; soft. (Alluvium)						17.5
1132.1	19.0				1 2 1 (3)				
1131.6	19.5		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; medium stiff. (Alluvium)						
1131.1	20.0		CL - LEAN CLAY; 5-15% fine sand; medium plasticity; dark gray; saturated; soft;						20.0

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BORING LOG

BORING No.: B-06

SHEET 2 of 6

DATE: 10-5-2010

WATER LEVELS ▼ 12.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			with clayey sand seams. (Alluvium)						20.0
			CL - LEAN CLAY; 5-15% fine sand; medium plasticity; dark gray; saturated; soft; with clayey sand seams. (Alluvium)						22.5
1127.6	23.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; gray; saturated; loose. (Alluvium)		2 3 2 (5)				
1126.6	24.5		CL - LEAN CLAY; medium plasticity; dark gray; saturated; medium stiff. (Alluvium)						25.0
1124.6	26.5		CL - SANDY LEAN CLAY; 40-50% fine to medium sand; medium plasticity; black; saturated; soft; with few 1/2" thick gray poorly graded sand seams. (Alluvium)			0.5*	94.4	30.8	
1123.6	27.5			9		0.4*			27.5
1123.2	27.9		CL - LEAN CLAY; 5-10% fine sand; medium plasticity; black; saturated; soft. (Alluvium)						
1122.6	28.5		CL - SANDY LEAN CLAY; 40-50% fine sand; medium plasticity; black; saturated; soft. (Alluvium)			0.4*			
1122.1	29.0				2				
1121.8	29.3		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; medium stiff. (Alluvium)		2 1 (3)				
			SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; dark gray; saturated; loose. (Alluvium)						30.0
			CL/CH - LEAN TO FAT CLAY; medium to high plasticity; very dark gray; saturated; soft. (Alluvium)						32.5
1117.6	33.5		CL - LEAN CLAY; medium plasticity; dark gray; saturated; soft; with organics. (Alluvium)		1 3 7 (10)				
1117.0	34.1		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; grayish brown with light olive brown; saturated; medium dense. (Alluvium)						35.0
									37.5
1112.6	38.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)		8 10 10 (20)				
1111.1	40.0								40.0

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BORING LOG

BORING No.: B-06

SHEET 3 of 6

DATE: 10-5-2010

WATER LEVELS ▼ 12.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)						40.0
1109.1	42.0								
1108.9	42.2		Encountered fine to coarse gravel layer. (Alluvium)						
			CL/ML - SILTY CLAY; low to medium plasticity; very pale brown mottled with brown and yellowish red; saturated; medium stiff; with abundant silt seams. (Alluvium)						42.5
					2				
1107.0	44.1		SM - SILTY SAND; 75-85% fine sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)		4				
					5				
					(9)				45.0
									47.5
1102.6	48.5		CH - FAT CLAY; high plasticity; dark brown; saturated; medium stiff; with abundant light grayish brown, loose silt seams. (Alluvium)		2				
					2				
					2				
					(4)				50.0
									52.5
1097.6	53.5								
1097.3	53.8		CH - FAT CLAY; high plasticity; grayish brown mottled with yellowish red; saturated; medium stiff. (Alluvium)		2				
			CL - LEAN CLAY with Sand; 15-25% fine sand; medium plasticity; dark grayish brown mottled with very pale brown and yellowish red; saturated; medium stiff; with silt lenses. (Alluvium)		2				
					3				
					(5)				55.0
									57.5
1092.6	58.5		SP - POORLY GRADED SAND; 10-15% fine gravel; 80-85% fine to coarse sand; nonplastic; yellowish brown with very pale brown and dark brown; saturated; dense. (Alluvium)		7				
					11				
					19				
1091.1	60.0				(30)				60.0

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SHEET 4 of 6

DATE: 10-5-2010

WATER LEVELS ▼ 12.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 10-15% fine gravel; 80-85% fine to coarse sand; nonplastic; yellowish brown with very pale brown and dark brown; saturated; dense. (Alluvium)						60.0
									62.5
1087.6	63.5		SC-SM - SILTY, CLAYEY SAND; 70-80% fine sand; low to medium plasticity; brown mottled with yellowish red; saturated; dense. (Alluvium)		9 17 18 (35)				65.0
									67.5
1082.6	68.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; brownish yellow with light yellowish brown; saturated; medium dense. (Alluvium)		5 8 10 (18)				70.0
									72.5
1077.6	73.5		SP-SM - POORLY GRADED SAND with Silt; 0-5% fine to coarse gravel; 80-90% fine to coarse sand; nonplastic; yellowish brown with brownish yellow; saturated; dense. (Alluvium)		12 15 19 (34)				75.0
									77.5
1072.6	78.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)		8 11 29 (40)				
1071.9	79.2								
1071.6	79.5		CL - LEAN CLAY; medium plasticity; light yellowish brown; saturated; very stiff. (Alluvium)						
1071.1	80.0								80.0

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SHEET 5 of 6

DATE: 10-5-2010

WATER LEVELS ▼ 12.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown; saturated; very dense. (Alluvium)						80.0
									82.5
1067.6	83.5		SP - POORLY GRADED SAND with Gravel; 15-20% fine to coarse gravel; 75-80% fine to coarse sand; nonplastic; brownish yellow with yellowish brown; saturated; very dense. (Alluvium)		10 18 31 (49)				85.0
									87.5
1061.6	89.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; dark brown with dark yellowish brown; saturated; very dense; with very thin ironstone layers. (Dakota Sandstone)		10 12 78/2" 100/4" (R)				90.0
									92.5
1057.6	93.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brownish yellow; saturated; very dense. (Dakota Sandstone)		100/6" (R)				95.0
									97.5
1052.6	98.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; dark yellowish brown; saturated; very dense. (Dakota Sandstone)		82 18/0.5" (R)				
1051.1	100.0								100.0

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PROJECT: Lincoln Haymarket Arena
Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: CL & GBW

BORING LOG

BORING No.: B-06

SHEET 6 of 6

DATE: 10-5-2010

WATER LEVELS ▼ 12.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; dark yellowish brown; saturated; very dense. (Dakota Sandstone)						100.0
									102.5
1047.6	103.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; yellowish brown; saturated; very dense. (Dakota Sandstone)		100/6" (R)				
1047.1	104.0		Boring Terminated at: 104.0ft						
									105.0
									107.5
									110.0
									112.5
									115.0
									117.5
									120.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 8f

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PROJECT: Lincoln Haymarket Arena
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LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: CL, BB & LDI

BORING LOG

BORING No.: B-07

SHEET 1 of 6

DATE: 10-6-2010

WATER LEVELS ▽ Cave-in @ 21.2' ▼ 6.6 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1149.5	0.0		CL - LEAN CLAY with Sand; 0-5% fine to coarse gravel; 15-20% fine to coarse sand; medium plasticity; olive brown with black; moist to wet; stiff. (Fill)		5 5 4 (9)				0.0
1147.5	2.0		RUBBLE; 18" thick						2.5
1146.0	3.5		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; very dark grayish brown; wet; medium stiff. (Alluvium)		1 2 2 (4)				5.0
1144.0	5.5		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; very dark grayish brown; wet to saturated; soft to medium stiff. (Alluvium)		1 1 2 (3)				
1142.9	6.6		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; very dark grayish brown; saturated; soft to medium stiff. (Alluvium)						7.5
1141.5	8.0		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; stiff. (Alluvium)			1.5*	91.6	28.7	
1140.7	8.8		CL - LEAN CLAY; 0-5% fine to medium sand; medium plasticity; dark olive brown; saturated; stiff. (Alluvium)	10		1.0* 1.75* 1.25*			10.0
1136.0	13.5		CL - LEAN CLAY; medium plasticity; olive brown; saturated; soft. (Alluvium)		0 1 1 (2)				12.5 15.0
1133.0	16.5		CL - LEAN CLAY; 0-5% fine sand; low to medium plasticity; dark grayish brown; saturated; soft to medium stiff. (Alluvium)			0.75* 0.25*			
1132.5	17.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light brownish gray; saturated; loose. (Alluvium)	11		0.75* 0.5*	96.7	24.7	17.5
1132.3	17.2		CL - LEAN CLAY with Sand; 20-30% fine to medium sand; medium plasticity; very dark gray; saturated; soft to medium stiff. (Alluvium)			0.5*			
1131.0	18.5		CL - LEAN CLAY; medium plasticity; grayish brown; saturated; very soft. (Alluvium)		0 0 0 (0)				
1129.5	20.0								20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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CREW: CL, BB & LDI

BORING LOG

BORING No.: B-07

SHEET 2 of 6

DATE: 10-6-2010

WATER LEVELS ▽ Cave-in @ 21.2' ▼ 6.6 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY; medium plasticity; grayish brown; saturated; very soft. (Alluvium)						20.0
									22.5
1126.5	23.0		SC - CLAYEY SAND; 60-70% fine to medium sand; dark grayish brown; saturated; very loose. (Alluvium)						
1125.5	24.0		CL - LEAN CLAY with Sand; 30-40% fine to medium sand; medium plasticity; dark grayish brown; saturated; stiff. (Alluvium)		1 3 6 (9)				25.0
									27.5
1121.0	28.5		SM - SILTY SAND; 75-85% fine to medium sand; nonplastic; gray; saturated; medium dense. (Alluvium)		6 8 13 (21)				30.0
									32.5
1116.0	33.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to coarse sand; nonplastic; grayish brown with yellowish brown; saturated; medium dense. (Alluvium)		6 6 9 (15)				35.0
									37.5
1109.5	40.0				9 12 13 (25)				40.0

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BORING No.: B-07

SHEET 3 of 6

DATE: 10-6-2010

WATER LEVELS ▽ Cave-in @ 21.2' ▼ 6.6 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to coarse sand; nonplastic; grayish brown with yellowish brown; saturated; medium dense. (Alluvium)						40.0
									42.5
1106.0	43.5		SM - SILTY SAND; 75-85% fine to coarse sand; nonplastic; light grayish brown; saturated; medium dense; with few thin clay seams. (Alluvium)		7 12 13 (25)				45.0
									47.5
					4 7 8 (15)				50.0
									52.5
1096.0	53.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; pale brown; saturated; dense. (Alluvium)		10 15 15 (30)				55.0
									57.5
1091.0	58.5		SM - SILTY SAND; 70-80% fine to medium sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		15 15 16 (31)				
1089.5	60.0								60.0

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CREW: CL, BB & LDI

BORING LOG

BORING No.: B-07

SHEET 4 of 6

DATE: 10-6-2010

WATER LEVELS ▽ Cave-in @ 21.2' ▼ 6.6 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 70-80% fine to medium sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)						60.0
									62.5
1086.0	63.5		SP-SM - POORLY GRADED SAND with Silt; 0-5% fine to coarse gravel; 80-90% fine to coarse sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		8 10 19 (29)				65.0
									67.5
					11 15 16 (31)				70.0
									72.5
1076.0	73.5		SM - SILTY SAND; 70-80% fine sand; nonplastic; yellowish brown; saturated; medium dense; with thin clay seams. (Alluvium)		4 4 13 (17)				75.0
									77.5
1071.0	78.5		SM - SILTY SAND; 0-5% fine to coarse gravel; 70-80% fine sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)		14 16 27 (43)				
1069.5	80.0								80.0

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BORING No.: B-07

SHEET 5 of 6

DATE: 10-6-2010

WATER LEVELS ▽ Cave-in @ 21.2' ▼ 6.6 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 0-5% fine to coarse gravel; 70-80% fine sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)						80.0
									82.5
1066.0	83.5		SP-SM - POORLY GRADED SAND with Silt; 0-5% fine to coarse gravel; 80-90% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)		14 19 27 (46)				85.0
1063.5	86.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; reddish brown; saturated; very dense. (Dakota Sandstone)						87.5
					100/6" (R)				90.0
									92.5
					100/4.5" (R)				95.0
									97.5
					100/4" (R)				
1049.5	100.0								100.0

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Figure C - 9e

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CREW: CL, BB & LDI

BORING LOG

BORING No.: B-07

SHEET 6 of 6

DATE: 10-6-2010

WATER LEVELS ▽ Cave-in @ 21.2' ▼ 6.6 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; reddish brown; saturated; very dense. (Dakota Sandstone)						100.0
									102.5
1046.0	103.5				100/3.5"				
1045.7	103.8		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; saturated; very dense. (Dakota Sandstone)		(R)				
			Boring Terminated at: 103.8ft						
									105.0
									107.5
									110.0
									112.5
									115.0
									117.5
									120.0

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-08

SHEET 1 of 5

DATE: 11-10-2010

WATER LEVELS ▼ 5.3 on 11-11-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1145.3	0.0	CL - SANDY LEAN CLAY; 0-5% fine gravel; 40-50% fine to coarse sand; medium plasticity; very dark grayish brown with black and brown; moist to wet; medium stiff to stiff. (Fill)						0.0
1144.3	1.0	CINDERS; black; moist; loose. (Fill)		4 3 4 4 (7)				
1142.8	2.5	CL - LEAN CLAY; medium plasticity; black; saturated; soft. (Fill)						2.5
1142.3	3.0	CL - LEAN CLAY with Sand; 5-10% fine to coarse gravel; 15-20% fine to coarse sand; medium plasticity; black; wet; medium stiff. (Fill)			1.0*	58.9	56.4	
1141.5	3.8	CL - LEAN CLAY; 0-5% fine to coarse gravel; 5-10% fine to coarse sand; medium plasticity; very dark gray with black and reddish brown; wet; soft to medium stiff; with a trace of brick. (Fill)	12		0.7* 0.75* 0.3*	88.2	34.5	
1140.0	5.3	CL - LEAN CLAY; 0-5% fine to coarse gravel; 5-10% fine to coarse sand; medium plasticity; very dark gray with black and reddish brow; saturated; soft to medium stiff; with a trace of brick. (Fill)						5.0
1139.3	6.0	ML - SILT; low plasticity; very dark gray with dark gray; saturated; very loose. (Alluvium)		0 1 1 1 (2)				
1138.0	7.3	CL - LEAN CLAY; medium plasticity; very dark grayish brown; saturated; soft. (Alluvium)						7.5
1137.3	8.0	SC - CLAYEY SAND; 55-65% fine sand; medium plasticity; dark gray; saturated; very loose. (Alluvium)						
1136.9	8.4	CL - LEAN CLAY with Sand; 20-30% fine sand; medium plasticity; very dark gray; saturated; medium stiff. (Alluvium)		1 2 3 3 (5)				
1136.3	9.0	CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff to stiff. (Alluvium)						10.0
1133.9	11.4	CL - LEAN CLAY; medium plasticity; dark gray mottled with gray; saturated; stiff. (Alluvium)		2 2 3 4 (5)				12.5
1131.8	13.5	CL - LEAN CLAY; 5-10% fine sand; medium plasticity; dark gray; saturated; medium stiff. (Alluvium)	13		0.75* 0.8* 0.3* 0.2*	90.8	31.1	
1130.6	14.7	CL - LEAN CLAY; 5-10% fine sand; medium plasticity; dark gray; saturated; very soft to soft. (Alluvium)						15.0
1129.8	15.5	CL - LEAN CLAY; medium plasticity; dark gray; saturated; medium stiff; with few silt seams. (Alluvium)		1 1 2 2 (3)				17.5
1126.3	19.0	SC-SM - SILTY, CLAYEY SAND; 60-70% fine sand; low to medium plasticity; dark gray with gray; saturated; loose. (Alluvium)		1 2 5				
1125.3	20.0							20.0

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CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-08

SHEET 2 of 5

DATE: 11-10-2010

WATER LEVELS ▼ 5.3 on 11-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 70-80% fine sand; low plasticity; dark grayish brown; saturated; medium dense. (Alluvium)		4 (7)				20.0
									22.5
1121.8	23.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; gray; saturated; medium dense. (Alluvium)		4 5 10 (15)				25.0
									27.5
					6 11 15 (26)				30.0
									32.5
					5 7 15 (22)				35.0
1108.3	37.0		CH - FAT CLAY; high plasticity; very dark grayish brown slightly mottled with yellowish red; saturated; stiff. (Alluvium)						37.5
1106.8	38.5								
1106.3	39.0		CL - LEAN CLAY with Sand; 15-25% fine sand; medium plasticity; grayish brown heavily mottled with yellowish red; saturated; medium stiff to stiff. (Alluvium)		2 3				
1105.3	40.0		SC-SM - SILTY, CLAYEY SAND; 50-60% fine sand; low to medium plasticity; brown mottled with yellowish red; saturated; loose. (Alluvium)		3 (6)				40.0

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CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-08

SHEET 3 of 5

DATE: 11-10-2010

WATER LEVELS ▼ 5.3 on 11-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SC-SM - SILTY, CLAYEY SAND; 50-60% fine sand; low to medium plasticity; brown mottled with yellowish red; saturated; loose; Alluvium. (Alluvium)						40.0
									42.5
1101.8	43.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; brown; saturated; dense. (Alluvium)		4 11 12 (23)				45.0
									47.5
1096.8	48.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to coarse sand; nonplastic; yellowish brown heavily mottled with yellowish red; saturated; medium dense. (Alluvium)		3 7 9 (16)				50.0
									52.5
1091.8	53.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; grayish brown; saturated; dense. (Alluvium)		9 14 23 (37)				55.0
									57.5
1086.8	58.5		CL - SANDY LEAN CLAY; 40-50% fine sand; medium plasticity; brown slightly mottled with yellowish red; saturated; very dense. (Alluvium)		6 6 7 (13)				
1085.3	60.0								60.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 10c

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CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-08

SHEET 4 of 5

DATE: 11-10-2010

WATER LEVELS ▼ 5.3 on 11-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - SANDY LEAN CLAY; 40-50% fine sand; medium plasticity; brown slightly mottled with yellowish red; saturated; very dense. (Alluvium)						60.0
									62.5
1081.8	63.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% medium to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)		6 6 8 (14)				65.0
									67.5
1076.8	68.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; light yellowish brown; saturated; medium dense. (Alluvium)		8 11 13 (24)				
1075.8	69.5		CL/ML - SILTY CLAY; low to medium plasticity; grayish brown; saturated; very stiff. (Alluvium)						70.0
									72.5
1071.8	73.5		SM - SILTY SAND; 50-60% fine sand; low plasticity; very pale brown; saturated; medium dense; with clay seams. (Alluvium)		3 4 8 (12)				75.0
									77.5
1066.8	78.5		SP - POORLY GRADED SAND; 5-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; brownish yellow with yellowish red; saturated; very dense. (Alluvium)		7 18 20 (38)				
1065.3	80.0								80.0

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CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-08

SHEET 5 of 5

DATE: 11-10-2010

WATER LEVELS ▼ 5.3 on 11-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 5-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; brownish yellow with yellowish red; saturated; very dense. (Alluvium)						80.0
1064.3	81.0		GP - POORLY GRADED GRAVEL; 95-100% fine to coarse gravel; nonplastic; brownish yellow with yellowish red; saturated; very dense. (Alluvium)						82.5
1062.3	83.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown with brownish yellow; saturated; very dense. (Dakota Sandstone)		100/3.75" (R)				85.0
									87.5
1056.8	88.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; dark yellowish brown; saturated; very dense. (Dakota Sandstone)		100/4.5" (R)				90.0
									92.5
1051.8	93.5		Boring Terminated at: 93.5ft						95.0
									97.5
									100.0

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 10e

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PROJECT: Lincoln Haymarket Arena
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LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: Soil Probe
CREW: GW

BORING LOG

BORING No.: B-08A

SHEET 1 of 1

DATE: 12-3-2010

WATER LEVELS ▼ 2.4 IAD

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	qu (tsf)	DEPTH (feet)
1142.7	0.0		ML - SILT; 5-15% fine sand; low plasticity; black; saturated; very loose; with organics. (Modern Alluvium)			0.0
1141.2	1.5		CL - LEAN CLAY; medium plasticity; very dark grayish brown; saturated; medium stiff. (Alluvium)		0.6*	
1140.7	2.0		CL/ML - SILTY CLAY; low to medium plasticity; very dark grayish brown; saturated; very soft; with silt seams. (Alluvium)			2.5
1140.2	2.5		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; soft to medium stiff. (Alluvium)		0.25*	
1139.7	3.0		CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff. (Alluvium)		0.75*	
					0.6*	5.0
1137.2	5.5		Boring Terminated at: 5.5ft			
						7.5
						10.0
						12.5
						15.0
						17.5
						20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75 / Hollow-Stem
CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-09

SHEET 1 of 5

DATE: 10-20-2010

WATER LEVELS ▽ Cave-in @ 21.2' ▼ 7.5 on 10-21-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1144.6	0.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; moist to wet; stiff. (Alluvium)		4 4 3 3 (7)				0.0
1143.1	1.5		CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; medium stiff. (Alluvium)						2.5
1140.6	4.0		CL - LEAN CLAY; medium plasticity; gray mottled with greenish gray and white and dark yellowish red; wet; soft; with lime concretions. (Alluvium)		1 1 1 2 (2)				5.0
1138.6	6.0		CL - LEAN CLAY; 10-15% fine to coarse sand; medium plasticity; very dark gray; wet; medium stiff. (Alluvium)	14		0.5* 0.5* 0.5*	94.4	28.5	
1137.1	7.5								7.5
1136.6	8.0		CL - LEAN CLAY; 10-15% fine to coarse sand; medium plasticity; very dark gray; saturated; medium stiff. (Alluvium)			0.8*			
			CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark gray mottled with yellowish red; saturated; soft to medium stiff. (Alluvium)		0 1 1 2 (2)				10.0
1133.6	11.0		CL - LEAN CLAY; 5-10% fine sand; medium plasticity; dark gray; saturated; soft. (Alluvium)		0 1 1 2 (2)				
1132.6	12.0		CL - LEAN CLAY with Sand; 15-20% fine sand; medium plasticity; dark gray; saturated; soft. (Alluvium)						12.5
1131.6	13.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; very dark gray mottled with dark gray; saturated; medium stiff. (Alluvium)		2 2 3 3 (5)				
1129.6	15.0		CL - LEAN CLAY with Sand; 20-30% fine sand; medium plasticity; very dark grayish brown; saturated; medium stiff to stiff. (Alluvium)						15.0
1128.1	16.5		CL - LEAN CLAY with Sand; 15-25% fine to medium sand; medium plasticity; olive brown heavily mottled with yellowish red; saturated; medium stiff to stiff. (Alluvium)	15		0.75* 1.25* 1.25* 1.25*	95.1	28.4	
1126.9	17.7		CL - LEAN CLAY; 5-10% fine sand; low to medium plasticity; dark gray; saturated; stiff. (Alluvium)						17.5
1126.0	18.6		CL - LEAN CLAY; medium plasticity; dark gray; saturated; soft. (Alluvium)		1 1 3 (4)				
1125.1	19.5		CL - LEAN CLAY; medium plasticity; dark gray; saturated; medium stiff to stiff;						
1124.6	20.0								20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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PROJECT: Lincoln Haymarket Arena
Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75 / Hollow-Stem
CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-09

DATE: 10-20-2010

WATER LEVELS ▽ Cave-in @ 21.2' ▼ 7.5 on 10-21-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			with few thin silty sand and fat clay seams. (Alluvium)						20.0
			CL - LEAN CLAY; medium plasticity; dark gray; saturated; medium stiff to stiff; with few thin silty sand and fat clay seams. (Alluvium)						
1122.6	22.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; gray; saturated; medium dense. (Alluvium)						22.5
1120.6	24.0		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; very pale brown heavily mottled with yellowish red; saturated; dense. (Alluvium)		6 12 12 (24)				25.0
									27.5
1116.1	28.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; very pale brown; saturated; loose; with silty sand seams. (Alluvium)		2 3 4 (7)				30.0
									32.5
1111.1	33.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		10 13 15 (28)				35.0
1109.1	35.5		GP - POORLY GRADED GRAVEL; encountered coarse gravel zone						
1108.1	36.5		CL - LEAN CLAY; 5-15% fine sand; medium plasticity; grayish brown heavily mottled with yellowish red; saturated; stiff. (Alluvium)						37.5
1105.8	38.8				5				
1105.3	39.3		SM - SILTY SAND; 75-85% fine sand; low plasticity; light brownish gray heavily mottled with yellowish red; saturated; medium dense. (Alluvium)		8 9				
1104.6	40.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light		(17)				40.0

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DATE: 10-20-2010

WATER LEVELS ▽ Cave-in @ 21.2' ▼ 7.5 on 10-21-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			brownish gray; saturated; medium dense. (Alluvium)						40.0
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light brownish gray; saturated; medium dense. (Alluvium)						42.5
1101.1	43.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		6 15 18 (33)				45.0
									47.5
1096.1	48.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light brownish gray with grayish brown mottled with yellowish red; saturated; dense; with clayey sand seams. (Alluvium)		6 8 17 (25)				50.0
									52.5
1091.1	53.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; very pale brown heavily mottled with dark yellowish red; saturated; dense. (Alluvium)		5 15 14 (29)				
1090.0	54.6		SC - CLAYEY SAND; 50-60% fine sand; medium plasticity; brown mottled with yellowish red; saturated; dense. (Alluvium)						55.0
									57.5
1086.6	58.0		SM - SILTY SAND; 60-70% fine sand; low plasticity; light grayish brown mottled with yellowish red; saturated; medium dense. (Alluvium)		10 9 9 (18)				
1085.3	59.3		CL - LEAN CLAY with Sand; 20-30% fine sand; light grayish brown mottled with yellowish red; saturated; very stiff; with sandy silt seams. (Alluvium)						
1084.6	60.0								60.0

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BORING LOG

BORING No.: B-09

SHEET 4 of 5

DATE: 10-20-2010

WATER LEVELS ▽ Cave-in @ 21.2' ▼ 7.5 on 10-21-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY with Sand; 20-30% fine sand; medium plasticity; light grayish brown mottled with yellowish red; saturated; very stiff; with sandy silt seams. (Alluvium)						60.0
1082.6	62.0		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; yellowish brown; saturated; dense. (Alluvium)						62.5
					9 12 12 (24)				65.0
									67.5
1076.1	68.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown with yellowish brown; saturated; medium dense. (Alluvium)		7 10 11 (21)				70.0
									72.5
1071.1	73.5		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; light grayish brown heavily mottled with yellowish red; saturated; medium stiff; with abundant silt and sandy silt seams. (Alluvium)		1 2 3 (5)				75.0
1067.6	77.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; brownish yellow; saturated; very dense. (Alluvium)						77.5
					12 20 26 (46)				
1064.6	80.0								80.0

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BORING LOG

BORING No.: B-09

SHEET 5 of 5

DATE: 10-20-2010

WATER LEVELS ▽ Cave-in @ 21.2' ▼ 7.5 on 10-21-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; brownish yellow; saturated; very dense. (Alluvium)						80.0
1062.6	82.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; brownish yellow with dark yellowish brown and yellowish brown; saturated; very dense. (Dakota Sandstone)						82.5
					00/5.75" (R)				
									85.0
									87.5
					00/3.75" (R)				
									90.0
									92.5
1051.1	93.5		Boring Terminated at: 93.5ft						
									95.0
									97.5
									100.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 12e

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CREW: CL, SG & GBW

BORING LOG

BORING No.: B-10

SHEET 1 of 5

DATE: 9-25-2010

WATER LEVELS ▽ Cave-in @ 14.8' ▼ 8.0 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	SAND CONTENT (%)	DEPTH (feet)
1146.5	0.0	CL - LEAN CLAY; 0-5% fine gravel; 5-10% fine to coarse sand; medium plasticity; very dark grayish brown; wet; stiff. (Fill)							0.0
1145.8	0.7	CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; stiff. (Topsoil)		3 3 5 (8)					
1144.9	1.6	CH - FAT CLAY; 10-15% fine sand; high plasticity; dark grayish brown; moist to wet; very stiff. (Subsoil)							
1143.7	2.8	SM - SILTY SAND; 70-80% fine sand; 20-30% fines, low plasticity; grayish brown mottled with yellowish red; moist; loose. (Alluvium)							2.5
1142.5	4.0	SM - SILTY SAND; 70-80% fine sand; 20-30% fines, low plasticity; grayish brown mottled with yellowish red; moist to wet; loose. (Alluvium)		4 3 5 (8)					5.0
1141.0	5.5	CL - SANDY LEAN CLAY; 30-40% fine sand; medium plasticity; brown; wet; soft to medium stiff. (Alluvium)							
1140.2	6.3	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines, nonplastic; very pale brown; moist to wet; loose. (Alluvium)		1 3 3 (6)					7.5
1138.5	8.0	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines, nonplastic; very pale brown; saturated; loose. (Alluvium)		2 3 4 (7)					10.0
			16						
1134.5	12.0	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines, nonplastic; brown; saturated; medium dense. (Alluvium)				112.0	15.9		12.5
				4 7 8 (15)					15.0
					0.0*	109.9	25.5		
			17		0.1*				17.5
1128.5	18.0	SP - POORLY GRADED SAND; fine to coarse sand; olive brown; saturated; loose. (Alluvium)		1 2 3 (5)					
1126.5	20.0								20.0

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BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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CREW: CL, SG & GBW

BORING LOG

BORING No.: B-10

SHEET 2 of 5

DATE: 9-25-2010

WATER LEVELS ▽ Cave-in @ 14.8' ▼ 8.0 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	SAND CONTENT (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; fine to coarse sand; olive brown; saturated; loose. (Alluvium)							20.0
										22.5
1123.0	23.5		SP - POORLY GRADED SAND; medium to coarse sand; brown; saturated; very dense. (Alluvium)		13 22 29 (51)					
1121.9	24.6		SP - POORLY GRADED SAND; fine to medium sand; yellowish brown heavily mottled with yellowish red; saturated; very dense. (Alluvium)							25.0
1119.0	27.5		CL - LEAN CLAY; medium plasticity; grayish brown mottled with yellowish red slightly mottled with black; saturated; medium stiff. (Alluvium)							27.5
					2 3 4 (7)					30.0
1114.5	32.0		SP - POORLY GRADED SAND; fine to medium sand; light yellowish brown; saturated; medium dense. (Alluvium)							32.5
1112.5	34.0		SP - POORLY GRADED SAND; 0-5% fine gravel; fine to coarse sand; light yellowish brown; saturated; medium dense. (Alluvium)		4 6 7 (13)					35.0
1109.0	37.5		CL - LEAN CLAY with Sand; 15-25% fine sand; medium plasticity; dark grayish brown with brown slightly mottled with yellowish red; saturated; medium stiff. (Alluvium)							37.5
1107.2	39.3		CL - SANDY LEAN CLAY; 35-45% fine sand; medium plasticity; brown mottled with yellowish red; saturated; medium stiff. (Alluvium)		4 4 4 (8)					
1106.5	40.0									40.0

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BORING LOG

BORING No.: B-10

SHEET 3 of 5

DATE: 9-25-2010

WATER LEVELS ▽ Cave-in @ 14.8' ▼ 8.0 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	SAND CONTENT (%)	DEPTH (feet)
			SC - CLAYEY SAND; 50-60% fine sand; 40-50% fines, medium plasticity; brown mottled with yellowish red; saturated; loose. (Alluvium)							40.0
1104.5	42.0		SM - SILTY SAND; 75-85% fine sand; 15-25% fines, low plasticity; light yellowish brown; saturated; loose. (Alluvium)							42.5
					2 3 4 (7)					
1101.9	44.6		SP - POORLY GRADED SAND; fine to medium sand; light yellowish brown; saturated; loose. (Alluvium)							45.0
										47.5
1098.0	48.5		SP - POORLY GRADED SAND; fine to medium sand; light yellowish brown mottled with yellowish red; saturated; dense; with sandy silt seams; trace of coarse sand. (Alluvium)		6 16 29 (45)					50.0
										52.5
1093.0	53.5		SP - POORLY GRADED SAND; 0-5% fine gravel; fine to coarse sand; yellowish brown mottled with yellowish red; saturated; medium dense. (Alluvium)		6 7 8 (15)					55.0
1089.5	57.0		SM - SILTY SAND; 70-80% fine to medium sand; 20-30% fines, nonplastic; brown slightly mottled with yellowish red; saturated; medium dense. (Alluvium)							57.5
					12 12 15 (27)					
1086.5	60.0									60.0

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CREW: CL, SG & GBW

BORING LOG

BORING No.: B-10

SHEET 4 of 5

DATE: 9-25-2010

WATER LEVELS ▽ Cave-in @ 14.8' ▼ 8.0 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	SAND CONTENT (%)	DEPTH (feet)
			SM - SILTY SAND; 70-80% fine to medium sand; 20-30% fines, nonplastic; brown slightly mottled with yellowish red; saturated; medium dense. (Alluvium)							60.0
										62.5
1083.0	63.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; fine to coarse sand; light olive brown mottled with dark brown; saturated; medium dense. (Alluvium)		4 8 9 (17)					65.0
										67.5
1078.0	68.5		SP - POORLY GRADED SAND; fine to medium sand; light yellowish brown; saturated; dense. (Alluvium)		9 12 22 (34)					70.0
										72.5
1073.0	73.5		SM - SILTY SAND; 75-85% fine sand; 15-25% fines, low plasticity; light yellowish brown heavily mottled with yellowish red; saturated; medium dense. (Alluvium)		4 5 14 (19)					
1071.9	74.6		SP - POORLY GRADED SAND; fine to medium sand; light olive brown; saturated; medium dense. (Alluvium)							75.0
										77.5
1068.0	78.5		SP - POORLY GRADED SAND; 0-5% fine gravel; fine to coarse sand; yellowish brown; saturated; dense. (Alluvium)		8 20 26 (46)					
1066.5	80.0									80.0

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CREW: CL, SG & GBW

BORING LOG

BORING No.: B-10

SHEET 5 of 5

DATE: 9-25-2010

WATER LEVELS ▽ Cave-in @ 14.8' ▼ 8.0 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	SAND CONTENT (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; fine to coarse sand; yellowish brown; saturated; dense. (Alluvium)							80.0
										82.5
1062.5	84.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines, nonplastic; yellowish brown; saturated; very dense. (Dakota Sandstone)		11 72 17/0.5" (R)				89	
										85.0
										87.5
1058.0	88.5		SM - SILTY SAND; 75-85% fine sand; 15-25% fines, nonplastic; dark yellowish brown with dark brown; saturated; very dense. (Dakota Sandstone)		00/5.75" (R)				85	
										90.0
										92.5
1053.0	93.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; 5-15% fines, nonplastic; dark yellowish brown with dark brown; saturated; very dense; with 1/4"-thick layers of ironstone. (Dakota Sandstone)		100/4" (R)					
										95.0
										97.5
1048.0	98.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines, nonplastic; yellowish brown with dark yellowish brown and dark brown; saturated; very dense; with thin layers of ironstone. (Dakota Sandstone)		100/3.5" (R)					
1047.7	98.8		Boring Terminated at: 98.8ft							100.0

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CREW: BB, LDI, GBW

BORING LOG

BORING No.: B-11

SHEET 1 of 5

DATE: 10-13-2010

WATER LEVELS ▽ Cave-in @ 12.1' ▼ 12.1 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1151.1	0.0		SP-SM - POORLY GRADED SAND with Silt; 20-30% fine to coarse gravel; 55-65% fine to coarse sand; nonplastic; black; moist; loose; with cinders. (Fill)						0.0
1150.1	1.0		SM - SILTY SAND; 5-15% fine to coarse gravel; 60-70% fine to coarse sand; nonplastic; black; wet; loose; with cinders. (Fill)		3 2 2 2 (4)				
1148.8	2.3		CL - LEAN CLAY; 5-10% fine to medium sand; medium plasticity; very dark gray; wet; medium stiff. (Fill)						2.5
1148.1	3.0		CL - LEAN CLAY; 10-15% fine to coarse sand; medium plasticity; black with dark yellowish brown and dark grayish brown; wet; medium stiff. (Fill)			0.5*			
1147.3	3.8		SM - SILTY SAND; 70-80% fine sand; nonplastic; dark yellowish brown; wet; loose. (Alluvium)	18		1.0*	114.1	8.1	
1146.1	5.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale brown with very pale brown; moist; loose. (Alluvium)		2 3 3 3 (6)				5.0
1144.6	6.5		SC-SM - SILTY, CLAYEY SAND; 70-80% fine sand; low to medium plasticity; brown; wet; loose. (Alluvium)						
1143.6	7.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; light yellowish brown with pale brown; moist; loose. (Alluvium)		2 2 3 4 (5)				7.5 10.0
1139.1	12.0 ▼		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; light yellowish brown with pale brown; saturated; loose. (Alluvium)		1 2 3 3 (5)				12.5
1137.6	13.5		SM - SILTY SAND; 75-85% fine sand; low plasticity; brown; saturated; loose. (Alluvium)		2 2 3 (5)				15.0 17.5
1132.6	18.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brown mottled with yellowish red; saturated; dense; with sandy silt seams. (Alluvium)		4 8 16 (24)				
1131.1	20.0								20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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PROJECT: Lincoln Haymarket Arena
Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75 / Hollow-Stem
CREW: BB, LDI, GBW

BORING LOG

BORING No.: B-11

DATE: 10-13-2010

WATER LEVELS ▽ Cave-in @ 12.1' ▼ 12.1 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brown mottled with yellowish red; saturated; dense; with sandy silt seams. (Alluvium)						20.0
									22.5
1127.6	23.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; pale brown; saturated; medium dense. (Alluvium)		2 5 8 (13)				25.0
									27.5
1122.6	28.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)		2 4 10 (14)				30.0
									32.5
1117.6	33.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light brownish gray; saturated; dense; with few thin clay seams. (Alluvium)		9 15 15 (30)				35.0
									37.5
1112.6	38.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light brownish gray; saturated; medium dense; with few thin clay seams. (Alluvium)		2 6 7 (13)				
1111.1	40.0								40.0

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BORING LOG

BORING No.: B-11

SHEET 3 of 5

DATE: 10-13-2010

WATER LEVELS ▽ Cave-in @ 12.1' ▼ 12.1 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light brownish gray; saturated; medium dense; with few thin clay seams. (Alluvium)						40.0
1109.1	42.0		CH - FAT CLAY; high plasticity; very dark grayish brown slightly mottled with dark yellowish red; saturated; medium stiff. (Alluvium)						42.5
					2 2 4 (6)				
1106.6	44.5		CL - LEAN CLAY; medium plasticity; very dark grayish brown; saturated; stiff. (Alluvium)						45.0
1105.1	46.0		CL/ML - SILTY CLAY; 0-5% fine sand; low to medium plasticity; grayish brown; saturated; medium stiff. (Alluvium)						
1104.1	47.0		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; very pale brown; saturated; medium dense; with abundant sandy silt seams. (Alluvium)						47.5
					6 7 11 (18)				50.0
									52.5
1097.6	53.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown; saturated; medium dense; with few thin clayey sand seams. (Alluvium)		9 12 10 (22)				55.0
									57.5
1092.6	58.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown mottled with yellowish red; saturated; medium dense; with few thin clayey sand seams. (Alluvium)		4 5 14 (19)				
1091.1	60.0								60.0

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BORING LOG

BORING No.: B-11

SHEET 4 of 5

DATE: 10-13-2010

WATER LEVELS ▽ Cave-in @ 12.1' ▼ 12.1 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown mottled with yellowish red; saturated; medium dense. (Alluvium)						60.0
									62.5
1087.1	64.0		SM - SILTY SAND; 0-5% fine to coarse gravel; 70-80% fine sand; nonplastic; very pale brown with light yellowish brown; saturated; very dense; with a trace of coarse sand. (Alluvium)		3 16 34 (50)				65.0
									67.5
1082.6	68.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; brown with yellowish brown; saturated; very dense. (Alluvium)		6 18 20 (38)				70.0
									72.5
1077.6	73.5		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; dark yellowish brown; saturated; very dense. (Alluvium)		9 16 32 (48)				75.0
									77.5
1072.6	78.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; light brownish gray heavily mottled with yellowish red and light yellowish brown; saturated; medium dense; with clay seams. (Alluvium)		7 10 12 (22)				
1071.1	80.0								80.0

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CREW: BB, LDI, GBW

BORING LOG

BORING No.: B-11

SHEET 5 of 5

DATE: 10-13-2010

WATER LEVELS ▽ Cave-in @ 12.1' ▼ 12.1 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine sand; nonplastic; light brownish gray heavily mottled with yellowish red and light yellowish brown; saturated; medium dense; with clay seams. (Alluvium)						80.0
									82.5
1067.6	83.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown; saturated; very dense. (Alluvium)		5 18 45 (63)				
1066.1	85.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown with brownish yellow and pale yellow; saturated; very dense. (Dakota Sandstone)		100/5.5" (R)				85.0
									87.5
1062.6	88.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown; saturated; very dense. (Dakota Sandstone)		00/4.75" (R)				
1062.1	89.0		Boring Terminated at: 89.0ft						
									90.0
									92.5
									95.0
									97.5
									100.0

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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Figure C - 14e

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CREW: CL & GBW

BORING LOG

BORING No.: B-12
SHEET 1 of 5
DATE: 10-4-2010

WATER LEVELS ▼ 9.2 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1148.9	0.0	CINDERS with Sand; 20-30% fine to coarse sand; 5-10% fine to coarse gravel; 15-20% fines, low plasticity; black; moist; medium dense. (Fill)		6 5 5 4 (10)				0.0
1146.4	2.5	CL - LEAN CLAY; 5-10% fine to coarse sand; medium plasticity; very dark gray; wet; soft. (Fill)						2.5
1145.9	3.0	CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; very soft. (Alluvium)		1 1 2 2 (3)				
1145.4	3.5	ML - SILT; low plasticity; very dark grayish brown; saturated; very loose. (Alluvium)						
1145.0	3.9	CL - LEAN CLAY; medium plasticity; saturated; soft. (Alluvium)						
1144.6	4.3	ML - SILT; low plasticity; very dark grayish brown; saturated; loose. (Alluvium)						5.0
1144.1	4.8	CL - LEAN CLAY; medium plasticity; very dark grayish brown; saturated; medium stiff. (Alluvium)		1 1 1 1 (2)				
1142.9	6.0	ML - SILT; low plasticity; very dark gray; saturated; very loose. (Alluvium)						
1142.4	6.5	OL - ORGANIC CLAY; medium plasticity; black slightly mottled with dark yellowish red; wet; soft. (Alluvium)						7.5
1141.9	7.0	OH - ORGANIC CLAY; high plasticity; black mottled with dark yellowish red; wet; soft. (Alluvium)						
1140.4	8.5	CH - FAT CLAY; high plasticity; very dark gray; wet; soft to medium stiff. (Alluvium)		1 2 3 (5)				
1139.9	9.0	CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet to saturated; medium stiff. (Alluvium)						
1139.7	9.2	CL - LEAN CLAY; medium plasticity; very dark grayish brown; saturated; medium stiff. (Alluvium)			0.9*			10.0
1138.9	10.0	CL - LEAN CLAY; 0-5% fine sand; medium plasticity; very dark gray with gray; saturated; medium stiff to stiff; with thin silt seams. (Alluvium)	19		0.8* 1.0* 1.75*	96.2	21.6	
1136.9	12.0	CL/ML - SILTY CLAY; very dark grayish brown; saturated; soft; with few silt seams. (Alluvium)						12.5
1134.7	14.2	ML - SILT; low plasticity; very dark grayish brown; saturated; loose; with abundant clay seams. (Alluvium)		1 1 2 (3)				15.0
1132.9	16.0	CL - LEAN CLAY; medium plasticity; very dark grayish brown; saturated; medium stiff. (Alluvium)		2 2 3 (5)				
1132.4	16.5	CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff. (Alluvium)						17.5
1129.9	19.0	CL - LEAN CLAY; medium plasticity; dark gray; saturated; medium stiff. (Alluvium)		1 2 2 (4)				
1128.9	20.0							20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 15a

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CREW: CL & GBW

BORING LOG

BORING No.: B-12

SHEET 2 of 5

DATE: 10-4-2010

WATER LEVELS ▼ 9.2 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY; medium plasticity; dark gray; saturated; medium stiff. (Alluvium)						20.0
1127.4	21.5					0.75*			
1126.9	22.0		CL - LEAN CLAY; medium plasticity; black; saturated; soft to medium stiff. (Alluvium)	20		0.4*			
			CH - FAT CLAY; high plasticity; dark greenish gray; saturated; very soft to soft; with few thin sand seams. (Alluvium)			0.25*	78.2	41.5	22.5
1125.4	23.5								
			CL - LEAN CLAY; medium plasticity; very dark gray; saturated; soft; with abundant silt seams. (Alluvium)		1 1 1				
1124.4	24.5		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; soft to medium stiff; with abundant silty sand seams. (Alluvium)		(2)				25.0
									27.5
					2 2 6				
1119.4	29.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; dark gray; saturated; loose; with clay seams. (Alluvium)		(8)				30.0
1116.9	32.0		CL - LEAN CLAY; medium plasticity; dark gray; saturated; very soft. (Alluvium)						32.5
					0 0 0				
					(0)				35.0
1111.9	37.0		CL - LEAN CLAY with Sand; 15-25% fine sand; medium plasticity; grayish brown mottled with yellowish red; saturated; stiff. (Alluvium)						37.5
1110.1	38.8		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; light brownish gray; saturated; medium dense. (Alluvium)		5 8 12				
1108.9	40.0				(20)				40.0

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Figure C - 15b

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CREW: CL & GBW

BORING LOG

BORING No.: B-12
SHEET 3 of 5
DATE: 10-4-2010

WATER LEVELS ▼ 9.2 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; light brownish gray; saturated; medium dense. (Alluvium)						40.0
									42.5
1105.9	43.0		CL - LEAN CLAY with Sand; 15-25% fine sand; medium plasticity; olive brown mottled with gray and yellowish red; saturated; stiff. (Alluvium)						
1105.2	43.7		CH - FAT CLAY; high plasticity; gray; saturated; stiff. (Alluvium)		3				
1104.9	44.0		ML - SANDY SILT; 30-40% fine sand; nonplastic; light grayish brown heavily mottled with yellowish red; saturated; medium dense. (Alluvium)		5				
1104.3	44.6		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown slightly mottled with yellowish red; saturated; medium dense. (Alluvium)		5 (10)				45.0
									47.5
1100.4	48.5		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; grayish brown mottled with yellowish red; saturated; stiff; with fat clay and silty sand seams. (Alluvium)		3				
1099.6	49.3		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light grayish brown slightly mottled with yellowish red; saturated; medium dense. (Alluvium)		4 6 (10)				50.0
									52.5
1095.4	53.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light brown with light grayish brown; saturated; medium dense. (Alluvium)		5 6 6 (12)				55.0
									57.5
1090.4	58.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light brown with light grayish brown; saturated; very dense. (Alluvium)		10				
1089.7	59.2		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)		22 20 (42)				
1088.9	60.0								60.0

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CREW: CL & GBW

BORING LOG

BORING No.: B-12

SHEET 4 of 5

DATE: 10-4-2010

WATER LEVELS ▼ 9.2 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)						60.0
									62.5
1085.9	63.0		SC - CLAYEY SAND; 60-70% fine to coarse sand; medium plasticity; yellowish brown; saturated; medium dense. (Alluvium)						
1085.1	63.8		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		9 11 20 (31)				65.0
									67.5
1080.4	68.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; yellowish brown; saturated; dense. (Alluvium)		6 11 14 (25)				70.0
1076.9	72.0		SP - POORLY GRADED SAND with Gravel; 15-25% fine to coarse gravel; 70-75% fine to coarse sand; nonplastic; yellowish brown; saturated; dense; with a trace of cobbles. (Alluvium)						72.5
1075.4	73.5		SC-SM - SILTY, CLAYEY SAND; 60-70% fine to coarse sand; low to medium plasticity; light brown; saturated; medium dense. (Alluvium)		9 9 6 (15)				75.0
									77.5
1070.4	78.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; yellowish brown with brownish yellow; saturated; dense. (Alluvium)		7 15 16 (31)				
1068.9	80.0								80.0

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Figure C - 15d

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BORING LOG

BORING No.: B-12

SHEET 5 of 5

DATE: 10-4-2010

WATER LEVELS ▼ 9.2 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; yellowish brown with brownish yellow; saturated; dense. (Alluvium)						80.0
									82.5
1065.4	83.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense. (Alluvium)		4 7 7 (14)				85.0
									87.5
1060.4	88.5		SP - POORLY GRADED SAND; 10-15% fine gravel; 80-85% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense. (Alluvium)		8 10 10 (20)				90.0
1057.4	91.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; yellowish brown with dark yellowish brown; saturated; very dense. (Dakota Sandstone)						92.5
					100/5.5" (R)				95.0
									97.5
1050.4	98.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; yellowish brown; saturated; very dense. (Dakota Sandstone)		100/2" (R)				
1048.9	100.0		Boring Terminated at: 100.0ft						100.0

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BORING LOG

BORING No.: B-13
SHEET 1 of 5
DATE: 9-29-2010

WATER LEVELS ▽ Cave-in @ 12.5' ▼ 9.0 on 9-30-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1149.1	0.0	CINDERS and Sand; 30-40% fine to coarse sand; 10-15% fine to coarse gravel; black; moist; loose. (Fill)		3 2 2 (4)				0.0
1146.8	2.3	CL - LEAN CLAY; medium plasticity; olive brown with very dark grayish brown and black; wet; very soft. (Fill)						2.5
1146.1	3.0	ML - SILT; 0-5% fine sand; low plasticity; light grayish brown; wet; loose. (Alluvium)			0.75*			
1145.1	4.0	CH - FAT CLAY; 0-5% sand; high plasticity; very dark grayish brown; wet; stiff to very stiff. (Alluvium)	21		0.75* 2.5*	84.7	34.6	
1144.1	5.0	CL - LEAN CLAY; medium plasticity; very dark grayish brown with grayish brown; saturated; soft to medium stiff; with few thin silt seams. (Alluvium)		1 1 2 (3)				5.0 7.5
1140.6	8.5	CL - LEAN CLAY; medium plasticity; very dark grayish brown mottled with dark yellowish red and black; saturated; soft. (Alluvium)		1 1 1 (2)				10.0
1138.1	11.0	CH - FAT CLAY; high plasticity; dark grayish brown heavily mottled with dark gray slightly mottled with yellowish red; saturated; soft. (Alluvium)		1 1 2				
1136.9	12.2							
1136.6	12.5	ML - SILT; low plasticity; dark gray; saturated; loose. (Alluvium)		1				12.5
1135.6	13.5	CH - FAT CLAY; high plasticity; dark grayish brown; saturated; soft. (Alluvium)		(3)				
1135.1	14.0	CL/CH - LEAN TO FAT CLAY; medium to high plasticity; very dark grayish brown mottled with dark yellowish red; saturated; very soft. (Alluvium)		0 1				
1134.1	15.0	CL - LEAN CLAY; medium plasticity; very dark grayish brown heavily mottled with dark olive brown; saturated; very soft. (Alluvium)		1 1				15.0
1133.1	16.0	CL/ML - SILTY CLAY with Sand; 15-25% fine sand; low to medium plasticity; dark gray; saturated; very soft. (Alluvium)		(2)				
1132.1	17.0	CL - LEAN CLAY; medium plasticity; dark gray; saturated; very soft. (Alluvium)		1 1 1				17.5
1131.1	18.0	CL - LEAN CLAY; medium plasticity; dark olive gray; saturated; very soft; with few thin silty sand seams. (Alluvium)		1 (2)				
1129.8	19.3	CL - LEAN CLAY with Sand; 20-30% fine sand; medium plasticity; dark gray; saturated; very soft to soft; with thin silt and sand seams. (Alluvium)	22		0.25*	98.2	23.3	
1129.4	19.7	SM - SILTY SAND; 70-80% fine to coarse sand; nonplastic; gray; saturated; loose. (Alluvium)			0.25*			20.0

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LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: CL & GBW

BORING LOG

BORING No.: B-13
SHEET 2 of 5
DATE: 9-29-2010

WATER LEVELS ▽ Cave-in @ 12.5' ▼ 9.0 on 9-30-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1129.1	20.0		CL - LEAN CLAY with Sand; 20-30% fine sand; medium plasticity; dark gray; saturated; soft to medium stiff. (Alluvium)			0.5*			20.0
									22.5
1125.6	23.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; pale brown; saturated; loose. (Alluvium)		2 2 2 (4)				25.0
									27.5
1120.6	28.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)		7 7 10 (17)				30.0
									32.5
1115.6	33.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; grayish brown; saturated; medium dense. (Alluvium)		6 8 12 (20)				35.0
									37.5
1110.6	38.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; grayish brown slightly mottled with dark yellowish red and black; saturated; medium dense. (Alluvium)		6 9 12 (21)				
1109.1	40.0								40.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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PROJECT: Lincoln Haymarket Arena
Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: CL & GBW

BORING LOG

BORING No.: B-13
SHEET 3 of 5
DATE: 9-29-2010

WATER LEVELS ▽ Cave-in @ 12.5' ▼ 9.0 on 9-30-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; grayish brown slightly mottled with dark yellowish red and black; saturated; medium dense. (Alluvium)						40.0
									42.5
1106.1	43.0		SC - CLAYEY SAND with Gravel; 65-75% fine to coarse sand; medium plasticity; grayish brown heavily mottled with yellowish red; saturated; medium dense. (Alluvium)		8				
1105.2	43.9		CL - LEAN CLAY; medium plasticity; light grayish brown; saturated; very stiff. (Alluvium)		9				
1104.6	44.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; brown; saturated; dense. (Alluvium)		14 (23)				45.0
									47.5
1100.6	48.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)		3 6 9 (15)				50.0
									52.5
					5 8 13 (21)				55.0
									57.5
1090.6	58.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)		11 22 23 (45)				
1089.1	60.0								60.0

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CREW: CL & GBW

BORING LOG

BORING No.: B-13
SHEET 4 of 5
DATE: 9-29-2010

WATER LEVELS ▽ Cave-in @ 12.5' ▼ 9.0 on 9-30-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)						60.0
									62.5
1085.6	63.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)		2 3 5 (8)				65.0
									67.5
1080.6	68.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 80-85% fine to coarse sand; 0-5% fines, nonplastic; brownish yellow with light yellowish brown; saturated; medium dense. (Alluvium)		6 6 6 (12)				70.0
1076.6	72.5		SC-SM - SILTY, CLAYEY SAND; 60-70% fine sand; 30-40% fines, low to medium plasticity; brown; saturated; medium dense; with few dark yellow fat clay lenses. (Alluvium)		8 5 8 (13)				72.5 75.0 77.5
1070.6	78.5		CL - LEAN CLAY; medium plasticity; grayish brown mottled with yellowish red; saturated; very stiff. (Alluvium)		7 5 13 (18)				
1069.6	79.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brown						
1069.1	80.0								80.0

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BORING LOG

BORING No.: B-13
SHEET 5 of 5
DATE: 9-29-2010

WATER LEVELS ▽ Cave-in @ 12.5' ▼ 9.0 on 9-30-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			and yellowish brown mottled with yellowish red; saturated; dense. (Alluvium)						80.0
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brown and yellowish brown mottled with yellowish red; saturated; dense. (Alluvium)						82.5
1065.6	83.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; brownish yellow with light yellowish brown; saturated; dense. (Alluvium)		7 9 16 (25)				85.0
1062.6	86.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; brownish yellow; saturated; very dense. (Dakota Sandstone)						87.5
					72 28/0.5" (R)				90.0
1058.1	91.0		4" thick ironstone layer						
1057.6	91.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown; saturated; very dense; with thin, moderately cemented ironstone layers. (Dakota Sandstone)						92.5
					100/6" (R)				95.0
									97.5
1050.6	98.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; yellowish brown with dark brown; saturated; very dense. (Dakota Sandstone)		100/5" (R)				
1050.1	99.0		Boring Terminated at: 99.0ft						100.0

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Figure C - 16e

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CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-14

SHEET 1 of 5

DATE: 10-18-2010

WATER LEVELS ▼ 5.3 on 10-19-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1146.0	0.0	CL - LEAN CLAY with Sand; 0-5% fine gravel; 15-25% fine to coarse sand; medium plasticity; black; wet; stiff. (Fill)						0.0
1145.0	1.0			3				
1144.5	1.5	CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; stiff. (Alluvium)		4				
		ML - SILT; low plasticity; brown; moist; medium dense. (Alluvium)		5				
				5				
				(9)				2.5
1143.2	2.8	CL - LEAN CLAY; medium plasticity; very dark grayish brown with very dark gray; wet to saturated; medium stiff. (Alluvium)						
				2				
				2				
				2				
				3				5.0
1140.7	5.3	CL - LEAN CLAY; medium plasticity; very dark grayish brown with very dark gray; saturated; medium stiff. (Alluvium)		(4)				
				1				
				2				
1139.0	7.0	CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff. (Alluvium)		2				
				2				7.5
				(4)				
				2				
				2				
1136.5	9.5	CH - FAT CLAY; high plasticity; very dark grayish brown; saturated; medium stiff. (Alluvium)		3				
				2				10.0
				(5)				
1134.0	12.0	CL - LEAN CLAY; 10-15% fine to medium sand; medium plasticity; dark grayish brown slightly mottled with dark yellowish brown; saturated; soft. (Alluvium)			0.25*			
1133.3	12.7				0.5*			12.5
1132.9	13.1	SC-SM - SILTY, CLAYEY SAND; 60-70% fine sand; low plasticity; dark grayish brown; saturated; loose. (Alluvium)	23		0.5*	93.0	29.7	
1132.0	14.0	CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark gray; saturated; medium stiff. (Alluvium)			0.8*			
1131.3	14.7	CL/ML - SILTY CLAY; low to medium plasticity; gray; saturated; medium stiff. (Alluvium)		1				
		ML - SILT; low plasticity; gray; saturated; medium dense. (Alluvium)		3				
				4				15.0
				4				
				(7)				
								17.5
1128.0	18.0	CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark gray; saturated; medium stiff to stiff. (Alluvium)						
				2				
				3				
				3				
1126.0	20.0			(6)				20.0

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RIG / METHOD: CME 75 / Hollow-Stem
CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-14

DATE: 10-18-2010

WATER LEVELS ▼ 5.3 on 10-19-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY; 5-10% fine sand; medium plasticity; dark gray with black and dark brown; saturated; medium stiff. (Alluvium)	24		0.75* 0.5* 0.75* 0.75* 0.5*	90.4	34.2	20.0
									22.5
1123.0	23.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; gray; saturated; loose. (Alluvium)		2 3 4 (7)				25.0
									27.5
1117.5	28.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; gray to light greenish gray; saturated; medium dense; slight odor. (Alluvium)		4 6 6 (12)				30.0
									32.5
1112.5	33.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; very pale brown with light brown; saturated; loose. (Alluvium)		2 2 5 (7)				35.0
									37.5
1107.5	38.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; light brown heavily mottled with yellowish red; saturated; loose. (Alluvium)		6 9 14 (23)				
1106.5	39.5								
1106.0	40.0		SM - SILTY SAND; 75-85% fine sand; low plasticity; light grayish brown mottled						40.0

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WATER LEVELS ▼ 5.3 on 10-19-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			with yellowish red; saturated; medium dense. (Alluvium)						40.0
			ML - SANDY SILT; 35-45% fine sand; low plasticity; grayish brown mottled with yellowish red; saturated; dense. (Alluvium)						
1103.5	42.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown; saturated; dense. (Alluvium)						42.5
					5 10 13 (23)				45.0
									47.5
1097.5	48.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown with light yellowish brown; saturated; medium dense. (Alluvium)		4 11 9 (20)				50.0
									52.5
					6 14 14 (28)				55.0
1089.0	57.0		CL - SANDY LEAN CLAY; 30-40% fine sand; medium plasticity; grayish brown mottled with yellowish red; saturated; very stiff. (Alluvium)						57.5
1088.0	58.0		SM - SILTY SAND; 75-85% fine sand; low plasticity; light brown slightly mottled with yellowish red; saturated; medium dense. (Alluvium)		7 7 8 (15)				
1086.0	60.0								60.0

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BORING LOG

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WATER LEVELS ▼ 5.3 on 10-19-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine sand; low plasticity; light brown slightly mottled with yellowish red; saturated; medium dense. (Alluvium)						60.0
									62.5
1082.5	63.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; 0-5% fines, nonplastic; brown with yellowish brown; saturated; medium dense. (Alluvium)		6 10 10 (20)				65.0
									67.5
1077.5	68.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; 0-5% fines, nonplastic; light yellowish brown with brownish yellow; saturated; very dense. (Alluvium)		6 22 24 (46)				70.0
									72.5
1072.5	73.5		SP - POORLY GRADED SAND with Gravel; 15-25% fine to coarse gravel; 70-75% fine to coarse sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		7 11 15 (26)				75.0
1068.5	77.5		SP-SM - POORLY GRADED SAND with Silt; 0-5% fine gravel; 80-90% fine sand; nonplastic; light yellowish brown with dark yellowish brown; saturated; very dense. (Alluvium)		20 25 18 (43)				77.5
1066.0	80.0								80.0

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BORING LOG

BORING No.: B-14

SHEET 5 of 5

DATE: 10-18-2010

WATER LEVELS ▼ 5.3 on 10-19-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 0-5% fine gravel; 80-90% fine sand; nonplastic; light yellowish brown with dark yellowish brown; saturated; very dense. (Alluvium)						80.0
1064.0	82.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown with brownish yellow; saturated; very dense. (Dakota Sandstone)						82.5
					100/4.5" (R)				
									85.0
									87.5
									90.0
									92.5
									95.0
									97.5
1047.5	98.5		Boring Terminated at: 98.5ft						100.0

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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WATER LEVELS

BORING LOG

BORING No.: B-15

SHEET 1 of 5

DATE: 11-10-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1145.1	0.0		CL - SANDY LEAN CLAY; 0-5% fine to coarse gravel; 30-40% fine to coarse sand; medium plasticity; very dark grayish brown; moist; very stiff. (Fill)						0.0
1144.6	0.5		SC - CLAYEY SAND; 10-15% fine to coarse gravel; 50-60% fine to coarse sand; low plasticity; very dark grayish brown; moist; loose to medium dense; with glass. (Fill)						
1143.4	1.7		CL - LEAN CLAY; medium plasticity; black; wet; soft to medium stiff. (Fill)						
1142.6	2.5		CL - LEAN CLAY with Sand; 15-20% fine to coarse sand; medium plasticity; black; wet; medium stiff. (Fill)	25					2.5
1140.6	4.5		CL - LEAN CLAY; medium plasticity; very dark gray; wet; soft; with organics. (Alluvium)		0 1 1 1				5.0
1139.1	6.0		CL - LEAN CLAY; medium plasticity; dark gray; wet; soft to medium stiff. (Alluvium)		(2)				
1138.1	7.0		CL - LEAN CLAY; medium plasticity; gray slightly mottled with white; wet; medium stiff. (Alluvium)						7.5
1136.1	9.0		CL - LEAN CLAY; medium plasticity; gray; wet; medium stiff. (Alluvium)		2 2 2 2 (4)				10.0
1134.1	11.0		CL/ML - SILTY CLAY; low to medium plasticity; gray; wet to saturated; soft. (Alluvium)		0 1 2				
1133.1	12.0		ML - SILT; low plasticity; gray; saturated; very loose to loose. (Alluvium)		1 (3)				12.5
1132.1	13.0		CL - LEAN CLAY; medium plasticity; gray; saturated; very soft. (Alluvium)						
1131.1	14.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; gray; saturated; very loose; with silt seams and soft clay seams. (Alluvium)		0 1 1 1 (2)				15.0
1127.1	18.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark gray; saturated; soft to medium stiff; with abundant silty sand and clayey sand seams. (Alluvium)		1 1 2 3 (3)				17.5
1125.1	20.0								20.0

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BORING LOG

BORING No.: B-15

SHEET 2 of 5

DATE: 11-10-2010

WATER LEVELS

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark gray; saturated; soft to medium stiff; with abundant silty sand and clayey sand seams. (Alluvium)						20.0
1123.6	21.5		SM - SILTY SAND; 65-75% fine to medium sand; low plasticity; dark gray; saturated; loose. (Alluvium)			0.3*	101.4	24.2	
1122.4	22.7			26		0.3*			22.5
1121.6	23.5		SP-SM - POORLY GRADED SAND with Silt; 0-5% fine to coarse gravel; 80-90% fine to coarse sand; nonplastic; olive brown; saturated; loose. (Alluvium)						
1121.1	24.0		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; gray; saturated; medium dense. (Alluvium)		5				
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; gray; saturated; medium dense. (Alluvium)		10 11 (21)				25.0
1117.6	27.5		CH - FAT CLAY; high plasticity; grayish brown mottled with yellowish red; saturated; stiff. (Alluvium)						27.5
1116.1	29.0		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light yellowish brown heavily mottled with yellowish red and black and dark grayish brown; saturated; dense. (Alluvium)		5 12 15 (27)				
1115.1	30.0		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; grayish brown heavily mottled with yellowish red; saturated; medium dense. (Alluvium)						30.0
									32.5
1111.6	33.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; grayish brown heavily mottled with dark yellowish red and black; saturated; medium dense. (Alluvium)		4 6 9 (15)				35.0
1108.6	36.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; grayish brown heavily mottled with dark yellowish red and black; saturated; medium dense; with abundant coarse sand and fine gravel. (Alluvium)						
1107.6	37.5		CH - FAT CLAY; high plasticity; very dark grayish brown mottled with dark yellowish red; saturated; stiff. (Alluvium)						37.5
1106.3	38.8				3				
1105.9	39.2		CL/CH - LEAN TO FAT CLAY; 10-15% fine sand; medium to high plasticity; very dark grayish brown heavily mottled with yellowish red; saturated; medium stiff to stiff. (Alluvium)		3				
1105.4	39.7				5 (8)				40.0

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WATER LEVELS

BORING LOG

BORING No.: B-15

SHEET 3 of 5

DATE: 11-10-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1105.1	40.0		SC-SM - SILTY, CLAYEY SAND; 60-70% fine sand; low to medium plasticity; grayish brown heavily mottled with yellowish red; saturated; loose. (Alluvium)						40.0
			SM - SILTY SAND; 70-80% fine sand; low plasticity; grayish brown mottled with light yellowish brown; saturated; medium dense. (Alluvium)						42.5
1101.6	43.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		6 9 15 (24)				45.0
									47.5
1096.6	48.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)		3 4 7 (11)				50.0
									52.5
1091.6	53.5		SP - POORLY GRADED SAND; 5-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; light grayish brown mottled with yellowish brown and black; saturated; medium dense. (Alluvium)		4 5 14 (19)				55.0
									57.5
1086.6	58.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; loose. (Alluvium)		1 3 3 (6)				
1085.1	60.0								60.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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LOCATION: Lincoln, Nebraska

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RIG / METHOD: CME 75 / Hollow-Stem
CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-15

SHEET 4 of 5

DATE: 11-10-2010

WATER LEVELS

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; loose. (Alluvium)						60.0
									62.5
1081.6	63.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown mottled with light brownish gray; saturated; dense. (Alluvium)		6 10 15 (25)				65.0
									67.5
1076.6	68.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; light yellowish brown mottled with yellowish red; saturated; medium dense; with few thin silty sand seams. (Alluvium)		4 5 12 (17)				70.0
1072.6	72.5		CL - LEAN CLAY; medium plasticity; light grayish brown; saturated; stiff. (Alluvium)						72.5
1071.4	73.7		ML - SANDY SILT; 30-40% fine sand; low plasticity; light grayish brown mottled with light yellowish brown; saturated; medium dense. (Alluvium)		4 4 8 (12)				75.0
									77.5
1066.6	78.5		SM - SILTY SAND; 55-65% fine sand; nonplastic; light grayish brown mottled with yellowish red; saturated; medium dense; with clay seams. (Alluvium)		3 5 6 (11)				
1065.4	79.7		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; light						80.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-15

SHEET 5 of 5

DATE: 11-10-2010

WATER LEVELS

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1065.1	80.0		yellowish brown; saturated; medium dense. (Alluvium)						80.0
			SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; light yellowish brown; saturated; medium dense. (Alluvium)						
1064.1	81.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; brownish yellow; saturated; very dense. (Dakota Sandstone)						
									82.5
					75 25/1" (R)				
									85.0
									87.5
1056.6	88.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Dakota Sandstone)		00/4.75" (R)				
									90.0
									92.5
1051.6	93.5		Boring Terminated at: 93.5ft						
									95.0
									97.5
									100.0

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RIG / METHOD: Soil Probe
CREW: GW

BORING LOG

BORING No.: B-15A

SHEET 1 of 1

DATE: 12-3-2010

WATER LEVELS ▽ Groundwater was 0.9 feet above ground surface.

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	qu (tsf)	DEPTH (feet)
1142.1	0.0		ML - SILT; low plasticity; black; saturated; very loose; with abundant organics. (Modern Alluvium)			0.0
1140.6	1.5					
1140.1	2.0		OL - ORGANIC CLAY; medium plasticity; very dark grayish brown; saturated; very soft. (Modern Alluvium)			
			OH - ORGANIC CLAY; high plasticity; very dark gray; saturated; medium stiff. (Alluvium)		0.6*	2.5
1139.1	3.0		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; soft to medium stiff. (Alluvium)		0.5*	
1137.1	5.0		CH - FAT CLAY; high plasticity; very dark gray; saturated; stiff. (Alluvium)		1.2*	5.0
1136.1	6.0		Boring Terminated at: 6.0ft			
						7.5
						10.0
						12.5
						15.0
						17.5
						20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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RIG / METHOD: CME 75 / Hollow-Stem
CREW: CL, BB & LDI

BORING LOG

BORING No.: B-16

SHEET 1 of 5

DATE: 10-2-2010

WATER LEVELS ▽ Cave-in @ 8.9' ▼ 8.8 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1146.8	0.0		CL - LEAN CLAY; 0-5% fine to coarse gravel; 5-10% fine to coarse sand; medium plasticity; olive brown with very dark brown; wet; stiff; with brick rubble. (Fill)		3 4 5 (9)			0.0
								2.5
1143.3	3.5		SC - CLAYEY SAND; 65-75% fine to medium sand; light olive brown; wet; medium dense. (Fill)		4 4 4 (8)			
1141.8	5.0							5.0
1141.5	5.3		CL - LEAN CLAY; 0-5% fine to coarse gravel; 5-10% fine to coarse sand; medium plasticity; very dark grayish brown; wet; very stiff; with brick rubble. (Fill)	27		110.5	5.6	
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to coarse sand; nonplastic; light olive brown with reddish brown; moist; loose to medium dense. (Alluvium)					
								7.5
1138.3	8.5		SM - SILTY SAND; 70-80% fine to coarse sand; nonplastic; yellowish brown; saturated; very loose. (Alluvium)		1 1 1 (2)			
								10.0
1134.8	12.0		SM - SILTY SAND; 70-80% fine to coarse sand; nonplastic; yellowish brown; saturated; loose. (Alluvium)					
								12.5
					2 2 4 (6)			
								15.0
1131.3	15.5		SM - SILTY SAND; 70-80% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)					
								17.5
					5 7 8 (15)			
1126.8	20.0							20.0

Figure C - 20a

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BORING LOG

BORING No.: B-16

DATE: 10-2-2010

WATER LEVELS ▽ Cave-in @ 8.9' ▼ 8.8 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 70-80% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)					20.0
								22.5
1123.3	23.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)		8 17 21 (38)			25.0
								27.5
1118.3	28.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)		2 3 6 (9)			
1117.3	29.5		CH - FAT CLAY; high plasticity; olive brown; saturated; very stiff. (Alluvium)					30.0
								32.5
1113.3	33.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)		6 15 6 (21)			35.0
								37.5
1108.3	38.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown with pale brown; saturated; medium dense. (Alluvium)		4 7 5 (12)			
1106.8	40.0							40.0

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BORING LOG

BORING No.: B-16

SHEET 3 of 5

DATE: 10-2-2010

WATER LEVELS ▽ Cave-in @ 8.9' ▼ 8.8 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown with pale brown; saturated; medium dense. (Alluvium)					40.0
								42.5
1103.3	43.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to coarse sand; nonplastic; light brown; saturated; medium dense. (Alluvium)		4 6 10 (16)			45.0
								47.5
					7 11 17 (28)			50.0
								52.5
					4 8 11 (19)			55.0
								57.5
					3 8 17 (25)			60.0
1086.8	60.0							

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BORING LOG

BORING No.: B-16

DATE: 10-2-2010

WATER LEVELS ▽ Cave-in @ 8.9' ▼ 8.8 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to coarse sand; nonplastic; light brown with brown; saturated; dense. (Alluvium)					60.0
								62.5
1083.3	63.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; light brown; saturated; dense. (Alluvium)		8 10 16 (26)			65.0
								67.5
1078.3	68.5		SP - POORLY GRADED SAND; 5-15% fine to coarse gravel; 85-95% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)		4 4 13 (17)			70.0
								72.5
1073.3	73.5		SM - SILTY SAND; 70-80% fine to medium sand; nonplastic; pale brown; saturated; medium dense. (Alluvium)		6 6 13 (19)			75.0
								77.5
1068.3	78.5		SM - SILTY SAND; 70-80% fine to medium sand; nonplastic; pale brown to gray; saturated; medium dense. (Alluvium)		3 6 13 (19)			
1066.8	80.0							80.0

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BORING LOG

BORING No.: B-16

SHEET 5 of 5

DATE: 10-2-2010

WATER LEVELS ▽ Cave-in @ 8.9' ▼ 8.8 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 70-80% fine to medium sand; nonplastic; pale brown to gray; saturated; medium dense. (Alluvium)					80.0
1064.8	82.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; yellowish red; saturated; very dense. (Dakota Sandstone)					82.5
					100/4" (R)			
								85.0
								87.5
					100/3.5" (R)			
1058.0	88.8		Boring Terminated at: 88.8ft					
								90.0
								92.5
								95.0
								97.5
								100.0

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BORING LOG

BORING No.: B-17

SHEET 1 of 5

DATE: 10-12-2010

WATER LEVELS ▽ Cave-in @ 12.3' ▼ 12.3 on 10-13-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1151.0	0.0	SC-SM - SILTY, CLAYEY SAND; 5-10% fine to coarse gravel; 70-80% fine to coarse sand; low to medium plasticity; black; moist to wet; loose; with cinders; with clay seams. (Fill)					0.0
				5 3 6 6 (9)			
1149.0	2.0	CL - LEAN CLAY; 0-5% fine to coarse sand; medium plasticity; dark brown with very dark gray; wet; very stiff; with silty sand seams. (Fill)					2.5
1148.0	3.0	SC - CLAYEY SAND; 50-60% fine to medium sand; dark yellowish brown; moist to wet; loose. (Alluvium)			106.8	14	
1147.2	3.8	SM - SILTY SAND; 70-80% fine to medium sand; dark yellowish brown; wet; loose. (Alluvium)	28				
1146.0	5.0	SM - SILTY SAND; 75-85% fine to medium sand; low plasticity; light yellowish brown; moist; loose. (Alluvium)		2 2 3 2 (5)			5.0
1145.0	6.0	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown; moist; loose. (Alluvium)					7.5
1142.0	9.0	SM - SILTY SAND; 75-85% fine sand; nonplastic; very pale brown; wet; loose. (Alluvium)		3 3 3 (6)			
1141.0	10.0	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; yellowish brown with dark yellowish brown; wet; loose; with thin clay seams. (Alluvium)	29		115.8	8.4	10.0
1139.0	12.0	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brown with very pale brown; saturated; medium dense. (Alluvium)					12.5
				4 4 3 (7)			
1136.5	14.5	SM - SILTY SAND; 70-80% fine sand; low plasticity; brown; saturated; loose. (Alluvium)					15.0
1135.5	15.5	SM - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; brown; saturated; loose. (Alluvium)					
1134.5	16.5	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light brownish gray heavily mottled with yellowish red; saturated; loose; with abundant clay seams. (Alluvium)					17.5
				1 2 3 (5)			
1131.0	20.0						20.0

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BORING LOG

BORING No.: B-17

SHEET 2 of 5

DATE: 10-12-2010

WATER LEVELS ▽ Cave-in @ 12.3' ▼ 12.3 on 10-13-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light brownish gray heavily mottled with yellowish red; saturated; loose; with abundant clay seams. (Alluvium)					20.0
								22.5
1127.5	23.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; brown; saturated; medium dense. (Alluvium)		6 6 8 (14)			25.0
								27.5
1122.5	28.5		CL - LEAN CLAY; medium plasticity; light brownish gray; saturated; soft to medium stiff; with silt seams. (Alluvium)		2 4			
1122.0	29.0		ML - SANDY SILT; 40-50% fine sand; low plasticity; grayish brown with brown slightly mottled with yellowish red; saturated; medium dense. (Alluvium)		2 2			
1121.2	29.8		CL - SANDY LEAN CLAY; 30-40% fine sand; medium plasticity; very dark grayish brown with dark grayish brown; saturated; medium stiff. (Alluvium)		(6)			30.0
								32.5
1117.5	33.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		7 14 13 (27)			35.0
								37.5
1112.5	38.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense. (Alluvium)		6 6 10 (16)			40.0
1111.0	40.0							

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BORING No.: B-17

SHEET 3 of 5

DATE: 10-12-2010

WATER LEVELS ▽ Cave-in @ 12.3' ▼ 12.3 on 10-13-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; brownish yellow; saturated; medium dense. (Alluvium)					40.0
								42.5
1107.5	43.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; yellowish brown mottled with yellowish red; saturated; medium dense. (Alluvium)		5 8 5 (13)			45.0
								47.5
1102.5	48.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown; saturated; very dense. (Alluvium)		5 19 25 (44)			50.0
								52.5
1097.5	53.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; light yellowish brown; saturated; dense; with clayey sand seams. (Alluvium)		7 10 23 (33)			55.0
								57.5
1092.5	58.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		9 11 18 (29)			60.0
1091.0	60.0							

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BORING LOG

BORING No.: B-17

SHEET 4 of 5

DATE: 10-12-2010

WATER LEVELS ▽ Cave-in @ 12.3' ▼ 12.3 on 10-13-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; very pale brown; saturated; dense. (Alluvium)					60.0
1089.0	62.0		SM - SILTY SAND; 70-80% fine sand; low plasticity; light brown; saturated; dense. (Alluvium)					62.5
					19 17 15 (32)			65.0
								67.5
1082.5	68.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to medium sand; nonplastic; pale brown; saturated; very dense; with a trace of coarse sand. (Alluvium)		7 17 40 (57)			70.0
								72.5
1076.6	74.4		SM - SILTY SAND; 55-65% fine sand; low plasticity; very pale brown; saturated; dense. (Alluvium)		6 11 22 (33)			75.0
								77.5
1072.5	78.5		ML - SILT; 10-15% fine sand; low plasticity; light gray with light grayish brown slightly mottled with yellowish red; saturated; medium dense; with sandy silt and silty sand seams; with clay seams. (Alluvium)		3 4 6			
1071.0	80.0							80.0

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SHEET 5 of 5

DATE: 10-12-2010

WATER LEVELS ▽ Cave-in @ 12.3' ▼ 12.3 on 10-13-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			ML - SILT; 10-15% fine sand; low plasticity; light gray with light grayish brown slightly mottled with yellowish red; saturated; medium dense; with sandy silt and silty sand seams; with clay seams. (Alluvium)		6 (10)			80.0
1069.5	81.5		Coarse gravel zone, very rough drilling					82.5
1067.0	84.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)		27 73/6" (R) 100/6" (R)			85.0
								87.5
1062.5	88.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Dakota Sandstone)		100/5" (R)			
1062.0	89.0		Boring Terminated at: 89.0ft					90.0
								92.5
								95.0
								97.5
								100.0

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Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: CL & BB

BORING LOG

BORING No.: B-18

SHEET 1 of 5

DATE: 10-1-2010

WATER LEVELS ▽ Cave-in @ 19.5' ▼ 10.6 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1148.8	0.0		CL - LEAN CLAY; 0-15% fine to coarse sand; medium plasticity; black; wet; medium stiff; with a trace of slag and rubble. (Fill)		3 3 2 (5)				0.0
									2.5
1145.3	3.5		CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; medium stiff; with thin silt seams. (Alluvium)		0 2 2 (4)				5.0
1142.3	6.5		CL - LEAN CLAY; medium plasticity; black slightly mottled with light gray; wet; stiff; with few thin silt seams. (Alluvium)	30		2.0* 1.5* 1.0*	94.3	27.2	7.5
1140.3	8.5		CH - FAT CLAY; 0-5% fine to medium sand; high plasticity; black mottled with very dark gray; wet; medium stiff. (Alluvium)		1 2 3 (5)				10.0
1138.3	10.5								
1138.2	10.6		CH - FAT CLAY; high plasticity; very dark gray; wet to saturated; medium stiff. (Alluvium)		2 2 2 (4)				
			CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff. (Alluvium)						12.5
1135.3	13.5		CL - LEAN CLAY; 10-15% fine sand; medium plasticity; grayish brown; saturated; medium stiff. (Alluvium)		1 2 3 (5)				15.0
1132.3	16.5		CL - LEAN CLAY; medium plasticity; olive brown slightly mottled with dark reddish brown; saturated; medium stiff to stiff. (Alluvium)	31		1.5* 0.5*	91.7	29.8	17.5
1131.0	17.8		CL - LEAN CLAY; medium plasticity; olive brown slightly mottled with dark reddish brown; saturated; soft. (Alluvium)			0.25*			
1130.3	18.5		CL - LEAN CLAY; medium plasticity; dark grayish brown; saturated; soft. (Alluvium)		0 1 1 (2)				
1128.8	20.0								20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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BORING LOG

BORING No.: B-18

SHEET 2 of 5

DATE: 10-1-2010

WATER LEVELS ▽ Cave-in @ 19.5' ▼ 10.6 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY; medium plasticity; dark grayish brown; saturated; soft. (Alluvium)						20.0
									22.5
1125.3	23.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light grayish brown; saturated; loose. (Alluvium)		1 2 2 (4)				25.0
									27.5
1120.3	28.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; light grayish brown; saturated; medium dense. (Alluvium)		7 9 13 (22)				30.0
									32.5
					7 8 11 (19)				35.0
									37.5
1110.3	38.5		SP-SM - POORLY GRADED SAND with Silt; 10-15% fine to coarse gravel; 75-80% fine to coarse sand; nonplastic; saturated; medium dense. (Alluvium)		7 10 11 (21)				
1108.8	40.0								40.0

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BORING LOG

BORING No.: B-18

SHEET 3 of 5

DATE: 10-1-2010

WATER LEVELS ▽ Cave-in @ 19.5' ▼ 10.6 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 10-15% fine to coarse gravel; 75-80% fine to coarse sand; nonplastic; saturated; medium dense. (Alluvium)						40.0
									42.5
1105.3	43.5		SM - SILTY SAND; 75-85% fine to medium sand; nonplastic; dark yellowish brown; saturated; dense. (Alluvium)		6 11 12 (23)				45.0
									47.5
1100.3	48.5		SM - SILTY SAND; 65-75% fine sand; nonplastic; grayish brown; saturated; medium dense. (Alluvium)		5 5 6 (11)				50.0
									52.5
1095.3	53.5		CL - LEAN CLAY with Sand; 20-30% fine to medium sand; medium plasticity; dark grayish brown slightly mottled with dark reddish brown; saturated; stiff to very stiff. (Alluvium)		3 4 7 (11)				55.0
									57.5
1090.3	58.5		SM - SILTY SAND; 70-80% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)		16 23 32 (55)				
1088.8	60.0								60.0

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BORING LOG

BORING No.: B-18

SHEET 4 of 5

DATE: 10-1-2010

WATER LEVELS ▽ Cave-in @ 19.5' ▼ 10.6 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 70-80% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)						60.0
									62.5
1085.3	63.5		SM - SILTY SAND; 70-80% fine to medium sand; nonplastic; grayish brown; saturated; medium dense. (Alluvium)		7 9 12 (21)				65.0
									67.5
					8 10 12 (22)				70.0
									72.5
1075.3	73.5		SM - SILTY SAND; 70-80% fine to medium sand; nonplastic; grayish brown; saturated; dense. (Alluvium)		11 11 12 (23)				75.0
									77.5
					8 16 21 (37)				
1068.8	80.0								80.0

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BORING LOG

BORING No.: B-18

SHEET 5 of 5

DATE: 10-1-2010

WATER LEVELS ▽ Cave-in @ 19.5' ▼ 10.6 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 70-80% fine to medium sand; nonplastic; grayish brown; saturated; dense. (Alluvium)						80.0
									82.5
1065.3	83.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)		6 8 11 (19)				85.0
1062.3	86.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; yellow; saturated; very dense. (Dakota Sandstone)						87.5
					100/5" (R)				90.0
									92.5
1055.3	93.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; yellowish brown; saturated; very dense. (Dakota Sandstone)		100/4" (R)				95.0
									97.5
					100/2" (R)				
1049.8	99.0		Boring Terminated at: 99.0ft						100.0

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CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-19

SHEET 1 of 5

DATE: 10-19-2010

WATER LEVELS ▽ Cave-in @ 16.0' ▼ 5.2 on 10-20-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1146.3	0.0	CL - SANDY LEAN CLAY; 0-5% fine to coarse gravel; 35-45% fine to coarse sand; medium plasticity; very dark gray; moist to wet; stiff. (Fill)						0.0
1145.5	0.8	CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; stiff. (Alluvium)		4 4 5 5 (9)				
1144.8	1.5	ML - SILT; low plasticity; brown with light grayish brown; moist; medium dense. (Alluvium)						2.5
1143.3	3.0	CL/CH - LEAN TO FAT CLAY; medium to high plasticity; very dark grayish brown; wet; stiff. (Alluvium)						
1142.8	3.5	CH - FAT CLAY; high plasticity; very dark gray; wet to saturated; stiff. (Alluvium)		1 4 4 5 (8)				
1141.1	5.2 ▼	CH - FAT CLAY; high plasticity; very dark gray; saturated; stiff. (Alluvium)						5.0
1140.3	6.0	CL - LEAN CLAY; medium plasticity; very dark gray; saturated; medium stiff; with slight odor. (Alluvium)		1 2 2 3 (4)				7.5
1137.8	8.5	CL - LEAN CLAY; medium plasticity; dark greenish gray; saturated; stiff; with moderate to strong odor. (Alluvium)		1 2 4 4 (6)				10.0
1134.3	12.0							
1134.2	12.1	CH - FAT CLAY; high plasticity; dark gray; saturated; stiff. (Alluvium)			0.5*			12.5
		CL - LEAN CLAY; medium plasticity; olive brown; saturated; soft; with thin silty sand seams. (Alluvium)	32		0.4*	92.2	27.1	
1132.3	14.0				0.2*			
1131.7	14.6	CL/ML - SILTY CLAY; low to medium plasticity; gray; saturated; very soft. (Alluvium)		1 1				
1131.2	15.1	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; gray; saturated; very loose. (Alluvium)		1 1				15.0
		ML - SILT with Sand; 20-30% fine sand; low plasticity; gray to dark gray with greenish gray; saturated; very loose; with silty sand seams. (Alluvium)		(2) 1 1				
1129.5	16.8	CH - FAT CLAY; high plasticity; very dark gray; saturated; stiff. (Alluvium)		2 (3)				17.5
1126.3	20.0			3 3 4 (7)				20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-19

DATE: 10-19-2010

WATER LEVELS ▽ Cave-in @ 16.0' ▼ 5.2 on 10-20-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
		CL - LEAN CLAY; 5-10% fine sand; medium plasticity; dark grayish brown mottled with dark reddish brown; saturated; stiff. (Alluvium)			1.5*	94.0	27.8	20.0
1125.4	20.9	ML - SILT with Sand; 15-25% fine sand; low plasticity; very dark gray; saturated; loose. (Alluvium)	33		1.25* 0.7*			
1124.3	22.0	ML - SILT; 0-5% fine sand; low plasticity; dark gray; saturated; very loose. (Alluvium)						22.5
1122.3	24.0	ML - SANDY SILT; 30-40% fine sand; low plasticity; dark gray; saturated; very loose. (Alluvium)		0 1 2 (3)				
1121.8	24.5	SM - SILTY SAND; 50-60% fine sand; nonplastic; gray; saturated; very loose to loose. (Alluvium)						25.0 27.5
1117.8	28.5	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; greenish gray; saturated; medium dense. (Alluvium)		6 7 8 (15)				30.0 32.5
1112.8	33.5	SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; gray with greenish gray; saturated; dense. (Alluvium)		6 8 17 (25)				35.0
1110.3	36.0	GP - POORLY GRADED GRAVEL; 95-100% fine to coarse sand; saturated. (Alluvium)						
1108.8	37.5	CL - LEAN CLAY; 10-15% fine sand; medium plasticity; brown slightly mottled with yellowish red; saturated; very stiff. (Alluvium)		5 7 10 (17)				37.5
1106.3	40.0							40.0

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CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-19

SHEET 3 of 5

DATE: 10-19-2010

WATER LEVELS ▽ Cave-in @ 16.0' ▼ 5.2 on 10-20-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY; 10-15% fine sand; medium plasticity; brown slightly mottled with yellowish red; saturated; very stiff. (Alluvium)						40.0
1105.3	41.0		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)						42.5
					3 3 5 (8)				45.0
									47.5
1097.8	48.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; medium dense. (Alluvium)		4 5 7 (12)				50.0
									52.5
1092.8	53.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; very pale brown; saturated; very dense. (Alluvium)		15 25 27 (52)				55.0
									57.5
1087.8	58.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Alluvium)		16 25 25 (50)				
1086.3	60.0								60.0

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BORING LOG

BORING No.: B-19

DATE: 10-19-2010

WATER LEVELS ▽ Cave-in @ 16.0' ▼ 5.2 on 10-20-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Alluvium)						60.0
									62.5
1082.8	63.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		10 10 22 (32)				65.0
									67.5
1077.8	68.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; light yellowish brown; saturated; medium dense. (Alluvium)		8 9 9 (18)				70.0
									72.5
1072.8	73.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)		9 10 11 (21)				75.0
1070.3	76.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						77.5
					00/5.25" (R)				
1066.3	80.0								80.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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BORING LOG

BORING No.: B-19

SHEET 5 of 5

DATE: 10-19-2010

WATER LEVELS ▽ Cave-in @ 16.0' ▼ 5.2 on 10-20-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						80.0
									82.5
					100/5" (R)				
									85.0
									87.5
1057.8	88.5		Boring Terminated at: 88.5ft						
									90.0
									92.5
									95.0
									97.5
									100.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 23e

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RIG / METHOD: Soil Probe
CREW: GW

BORING LOG

BORING No.: B-19A

SHEET 1 of 1

DATE: 12-3-2010

WATER LEVELS ▽ Groundwater was 0.6 feet above ground surface.

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	qu (tsf)	DEPTH (feet)
1142.7	0.0		CL/ML - SILTY CLAY; 5-15% fine to coarse sand; low to medium plasticity; very dark grayish brown; saturated; very soft. (Modern Alluvium)			0.0
1142.0	0.7		CH - FAT CLAY; high plasticity; very dark gray; saturated; stiff. (Alluvium)		1.8*	
					1.9*	
						2.5
1139.1	3.6		Boring Terminated at: 3.6ft			
						5.0
						7.5
						10.0
						12.5
						15.0
						17.5
						20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-20

SHEET 1 of 5

DATE: 10-12-2010

WATER LEVELS ▽ Cave-in @ 11.5' ▼ 4.7 on 10-13-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1146.1	0.0	CL - SANDY LEAN CLAY; 0-5% fine to coarse gravel; 35-45% fine to coarse sand; medium plasticity; moist; medium stiff; with brick, ceramics and glass. (Fill)						0.0
1145.1	1.0	Concrete and Brick rubble; 40-50% fine to coarse sand; 5-10% fines, low plasticity; very dark grayish brown; moist; medium dense. (Fill)		7 6 5 5 (11)				2.5
1142.6	3.5	CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; very soft. (Alluvium)		1 1 1 1 (2)				
1141.9	4.2	CL/ML - SILTY CLAY; low to medium plasticity; dark gray; saturated; very soft; with organics. (Alluvium)						
1141.1	5.0	CL - LEAN CLAY; medium plasticity; dark gray; saturated; very soft. (Alluvium)						5.0
1139.6	6.5	CL - LEAN CLAY; 0-5% fine sand; medium plasticity; olive gray mottled with black slightly mottled with red; saturated; medium stiff. (Alluvium)			0.75* 0.75*			
1138.6	7.5	CL - LEAN CLAY; 0-5% fine sand; medium plasticity; olive gray mottled with black slightly mottled with red; saturated; medium stiff to stiff. (Alluvium)	34		1.0* 1.0*	97.1	26.6	7.5
1137.6	8.5	CL - LEAN CLAY; medium plasticity; greenish gray slightly mottled with yellowish red; saturated; soft to medium stiff. (Alluvium)		1 1 2 2 (3)				
1136.3	9.8	CL/ML - SILTY CLAY; low to medium plasticity; greenish gray; saturated; medium stiff. (Alluvium)						10.0
1135.1	11.0	ML - SILT; low plasticity; greenish gray; saturated; very loose. (Alluvium)		0 0 1 1 (1)				12.5
				0 0 0 0 (0)				15.0
1130.1	16.0	CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff. (Alluvium)						17.5
				2 2 3 (5)				
1126.1	20.0							20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 25a

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BORING LOG

BORING No.: B-20

DATE: 10-12-2010

WATER LEVELS ▽ Cave-in @ 11.5' ▼ 4.7 on 10-13-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff. (Alluvium)						20.0
1124.1	22.0		CH - FAT CLAY; high plasticity; black; saturated; soft to medium stiff. (Alluvium)			0.4*			
				35		0.75*	80.7	39.6	22.5
1122.9	23.2		CL - LEAN CLAY; medium plasticity; black; saturated; medium stiff to stiff; with several gray, fine to coarse silty sand seams. (Alluvium)			1.0*			
1122.1	24.0		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; medium stiff; with a trace of shells and wood fragments. (Alluvium)		0 2				
1121.0	25.1				2				25.0
1120.8	25.3		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; dark gray; saturated; loose. (Alluvium)		3				
			CL - LEAN CLAY; medium plasticity; very dark grayish brown; saturated; soft; with clean sand seams. (Alluvium)		(4)				
									27.5
1117.6	28.5		CL/ML - SILTY CLAY; low plasticity; greenish gray; saturated; stiff; with silt seams. (Alluvium)		2 5				
1116.6	29.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; greenish gray; saturated; medium dense. (Alluvium)		9 (14)				30.0
									32.5
1112.6	33.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; light grayish brown mottled with light yellowish brown; saturated; medium dense. (Alluvium)		5 9 10 (19)				35.0
1109.1	37.0		SC - CLAYEY SAND; 50-60% fine sand; low plasticity; brown heavily mottled with yellowish red; saturated; medium dense. (Alluvium)						37.5
1106.6	39.5				5 6 9				
1106.1	40.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; very pale brown; saturated;		(15)				40.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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PROJECT: Lincoln Haymarket Arena
Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75 / Hollow-Stem
CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-20

DATE: 10-12-2010

WATER LEVELS ▽ Cave-in @ 11.5' ▼ 4.7 on 10-13-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			medium dense. (Alluvium)						40.0
			SM - SILTY SAND; 75-85% fine sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)						42.5
1102.6	43.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		4 14 17 (31)				45.0
									47.5
1097.6	48.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		4 9 14 (23)				50.0
									52.5
1092.6	53.5		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; light grayish brown; saturated; dense; with few clayey sand seams. (Alluvium)		7 9 21 (30)				55.0
1090.1	56.0		SC-SM - SILTY, CLAYEY SAND; 65-75% fine sand; low to medium plasticity; grayish brown with light yellowish brown; saturated; dense. (Alluvium)						57.5
1088.1	58.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		12 18 26 (44)				
1086.6	59.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; very						60.0
1086.1	60.0								

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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BORING LOG

BORING No.: B-20
SHEET 4 of 5
DATE: 10-12-2010

WATER LEVELS ▽ Cave-in @ 11.5' ▼ 4.7 on 10-13-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			pale brown with yellowish brown; saturated; very dense. (Alluvium)						60.0
			SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; very pale brown with yellowish brown; saturated; very dense. (Alluvium)						62.5
1082.6	63.5		SP - POORLY GRADED SAND; 10-15% fine gravel; 80-85% fine to coarse sand; nonplastic; brown slightly mottled with black; saturated; dense. (Alluvium)		7 12 17 (29)				65.0
									67.5
1077.6	68.5		SP - POORLY GRADED SAND; 10-15% fine gravel; 80-85% fine to coarse sand; nonplastic; brown slightly mottled with black; saturated; medium dense. (Alluvium)		5 6 7 (13)				70.0
									72.5
1073.1	73.0		SM - SILTY SAND; 60-70% fine sand; low plasticity; light brownish gray mottled with yellowish red; saturated; medium dense. (Alluvium)						
1072.4	73.7		CL - LEAN CLAY; medium plasticity; light brownish gray mottled with yellowish red; saturated; very stiff; with clean sand seams. (Alluvium)		4 9 17 19 (26)				
1071.4	74.7		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown; saturated; dense; with clay seams. (Alluvium)						75.0
1070.1	76.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						77.5
					00/4.25" (R)				
1066.1	80.0								80.0

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BORING LOG

BORING No.: B-20

SHEET 5 of 5

DATE: 10-12-2010

WATER LEVELS ▽ Cave-in @ 11.5' ▼ 4.7 on 10-13-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						80.0
									82.5
1062.6	83.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale yellow with light yellowish brown; saturated; very dense. (Dakota Sandstone)		100/4.5" (R)				
1062.1	84.0		Boring Terminated at: 84.0ft						
									85.0
									87.5
									90.0
									92.5
									95.0
									97.5
									100.0

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CREW: CL, SG & GBW

BORING LOG

BORING No.: B-21

SHEET 1 of 5

DATE: 9-24-2010

WATER LEVELS ▽ Cave-in @ 9.8' ▼ 8.0 on 9-25-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	SAND CONTENT (%)	DEPTH (feet)
1147.1	0.0	SM - SILTY SAND; 0-5% fine to coarse gravel; 55-65% fine to coarse sand; 35-45% fines, low plasticity; very dark grayish brown and black; moist; loose; trace of cobbles. (Fill)						0.0
1145.3	1.8	CL - LEAN CLAY with Sand; 20-30% fine to coarse sand; medium plasticity; very dark gray with olive brown; wet; medium stiff. (Fill)						
1144.7	2.4	CL - LEAN CLAY; medium plasticity; light olive brown with very dark gray; wet; medium stiff. (Fill)		2 2 2 (4)				2.5
1141.6	5.5	CL - SANDY LEAN CLAY; 40-50% fine sand; medium plasticity; grayish brown; wet; medium stiff. (Alluvium)	36		78.3	37.3		5.0
1139.1	8.0	CL - SANDY LEAN CLAY; 40-50% fine sand; medium plasticity; grayish brown; saturated; medium stiff. (Alluvium)		2 4 6 (10)				7.5
1138.4	8.7	SM - SILTY SAND; 75-85% fine to medium sand; 15-25% fines, nonplastic; light grayish brown; saturated; loose to medium dense. (Alluvium)						10.0
1136.1	11.0	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; 5-15% fines, nonplastic; light brownish gray; saturated; loose. (Alluvium)		3 4 4 (8)				12.5
1133.6	13.5	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; 5-15% fines, nonplastic; light brownish gray mottled with greenish gray; saturated; medium dense. (Alluvium)		3 4 8 (12)				15.0
1129.1	18.0	SP - POORLY GRADED SAND; fine to medium sand; very dark gray; saturated; medium dense; Strong diesel fuel oder. (Alluvium)		2 6 9 (15)				17.5
1127.1	20.0							20.0

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BORING LOG

BORING No.: B-21

SHEET 2 of 5

DATE: 9-24-2010

WATER LEVELS ▽ Cave-in @ 9.8' ▼ 8.0 on 9-25-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	SAND CONTENT (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; fine to medium sand; very dark gray; saturated; medium dense. (Alluvium)						20.0
									22.5
1123.6	23.5		SP - POORLY GRADED SAND; fine to medium sand; light brownish gray; saturated; very loose to loose. (Alluvium)		5 2 2 (4)				25.0
				37		105.9	19.3		
									27.5
1118.6	28.5		SP - POORLY GRADED SAND; fine to medium sand; light brownish gray; saturated; medium dense; with a trace of coarse sand. (Alluvium)		4 11 16 (27)				30.0
									32.5
1113.6	33.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; fine to coarse sand; light yellowish brown; saturated; medium dense. (Alluvium)		5 11 17 (28)				35.0
									37.5
					7 12 16 (28)				
1107.1	40.0								40.0

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BORING LOG

BORING No.: B-21

DATE: 9-24-2010

WATER LEVELS ▽ Cave-in @ 9.8' ▼ 8.0 on 9-25-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	SAND CONTENT (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; fine to coarse sand; light yellowish brown; saturated; medium dense. (Alluvium)						40.0
									42.5
1103.6	43.5		SP - POORLY GRADED SAND; fine sand; yellowish brown; saturated; medium dense. (Alluvium)		7 11 15 (26)				45.0
									47.5
1098.6	48.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; fine to coarse sand; yellowish brown mottled with yellowish red; saturated; dense. (Alluvium)		11 14 17 (31)				50.0
									52.5
1094.1	53.0		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; fine to coarse sand; yellowish brown mottled with yellowish red; saturated; medium dense. (Alluvium)		7 7 5 (12)				
1092.8	54.3		SC - CLAYEY SAND; 0-5% fine gravel; 70-80% fine to coarse sand; 20-30% fines, medium plasticity; grayish brown; saturated; medium dense. (Alluvium)						55.0
									57.5
1089.1	58.0		SM - SILTY SAND; 70-80% fine to medium sand; 20-30% fines, nonplastic; brown; saturated; very dense. (Alluvium)		24 36 33 (69)			76	
1087.1	60.0								60.0

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BORING LOG

BORING No.: B-21

SHEET 4 of 5

DATE: 9-24-2010

WATER LEVELS ▽ Cave-in @ 9.8' ▼ 8.0 on 9-25-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	SAND CONTENT (%)	DEPTH (feet)
			SM - SILTY SAND; 70-80% fine to medium sand; 20-30% fines, nonplastic; brown; saturated; very dense. (Alluvium)						60.0
									62.5
1083.6	63.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; fine to coarse sand; yellowish brown; saturated; dense. (Alluvium)		9 12 21 (33)				65.0
									67.5
1078.6	68.5		SP - POORLY GRADED SAND; fine sand; very pale brown; saturated; medium dense. (Alluvium)		13 9 31 (40)				
1077.7	69.4								
1077.3	69.8		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; fine to coarse sand; brownish yellow; saturated; loose. (Alluvium)						70.0
			SM - SILTY SAND; 65-75% fine sand; 25-35% fines, nonplastic; brownish yellow with light gray; saturated; dense. (Alluvium)						72.5
1073.6	73.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines, nonplastic; very pale brown; saturated; dense. (Alluvium)		12 23 30 (53)			94	
1072.6	74.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines, nonplastic; brownish yellow; saturated; very dense. (Alluvium)					93	75.0
1070.6	76.5		SM - SILTY SAND; 70-80% fine sand; 20-30% fines, nonplastic; dark yellowish brown with white; saturated; very dense. (Dakota Sandstone)						77.5
					83 17/0.5" (R)			77	
1067.1	80.0								80.0

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BORING LOG

BORING No.: B-21

DATE: 9-24-2010

WATER LEVELS ▽ Cave-in @ 9.8' ▼ 8.0 on 9-25-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	DRY DENSITY (pcf)	MOISTURE (%)	SAND CONTENT (%)	DEPTH (feet)
			SM - SILTY SAND; 70-80% fine sand; 20-30% fines, nonplastic; dark yellowish brown with white; saturated; very dense. (Dakota Sandstone)						80.0
									82.5
1063.6	83.5		SM - SILTY SAND; 75-85% fine sand; 15-25% fines, nonplastic; light yellowish brown; saturated; very dense. (Dakota Sandstone)		100/3.5" (R)			81	
									85.0
									87.5
1058.6	88.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines, nonplastic; yellowish brown; saturated; very dense. (Dakota Sandstone)		00/4.75" (R)			91	
									90.0
									92.5
1053.6	93.5		Boring Terminated at: 93.5ft						
									95.0
									97.5
									100.0

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BORING LOG

BORING No.: B-22

SHEET 1 of 5

DATE: 11-11-2010

WATER LEVELS ▼ 12.5 on 11-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1151.4	0.0		BALLAST; with 30-40% low plastic fines; very dark grayish brown; moist; medium dense. (Fill)						0.0
1150.8	0.6		CL - LEAN CLAY with Sand; 15-25% fine to coarse sand; medium plasticity; dark greenish gray with very dark gray and black; wet; medium stiff to stiff. (Fill)						
1149.4	2.0		CL - LEAN CLAY; 5-10% fine sand; medium plasticity; dark greenish gray with black; wet; soft to medium stiff. (Fill)	38		0.1*	92.9	28	2.5
1149.0	2.4		CL - LEAN CLAY with Sand; 15-20% fine to medium sand; medium plasticity; very dark grayish brown with dark greenish gray; wet; medium stiff. (Fill)			0.5*			
1147.4	4.0		CL - LEAN CLAY with Sand; 15-25% fine sand; medium plasticity; black; wet; medium stiff. (Alluvium)		2 2				
1146.4	5.0		SC - CLAYEY SAND; 55-65% fine sand; medium plasticity; very dark gray; wet; loose. (Alluvium)		3 3 (5)				5.0
1145.4	6.0		SM - SILTY SAND; 65-75% fine to medium sand; nonplastic; dark yellowish brown with dark gray; wet; loose. (Alluvium)	39			104.1	11.4	7.5
1143.4	8.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; gray; wet; medium dense. (Alluvium)		3 4 5 5 (9)				10.0
1139.8	11.6		SM - SILTY SAND; 75-85% fine sand; nonplastic; greenish gray; wet; loose. (Alluvium)		1 2 3				
1139.2	12.2		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; greenish gray; wet to saturated; loose; with thin silty sand seams. (Alluvium)		3 (5)				12.5
1138.9	12.5 ▼		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; greenish gray; saturated; loose; with thin silty sand seams. (Alluvium)		2				
1137.9	13.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; greenish gray; saturated; medium dense. (Alluvium)		4 5 6 (9)				15.0
									17.5
1132.9	18.5		SC - CLAYEY SAND; 50-60% fine sand; medium plasticity; grayish brown heavily mottled with yellowish red; saturated; loose. (Alluvium)		2 2 3				
1131.9	19.5		SM - SILTY SAND; 60-70% fine sand; low plasticity; grayish brown heavily		(5)				20.0
1131.4	20.0								

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BORING LOG

BORING No.: B-22

SHEET 2 of 5

DATE: 11-11-2010

WATER LEVELS ▼ 12.5 on 11-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			mottled with yellowish red; saturated; loose. (Alluvium)						20.0
			SM - SILTY SAND; 60-70% fine sand; low plasticity; grayish brown heavily mottled with yellowish red; saturated; loose. (Alluvium)						22.5
1127.9	23.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; brown; saturated; medium dense. (Alluvium)		6 8 9 (17)				
1126.9	24.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; brown slightly mottled with very dark grayish brown; saturated; medium dense. (Alluvium)						25.0
1123.9	27.5		CH - FAT CLAY; high plasticity; very dark grayish brown mottled with dark yellowish red and black; saturated; stiff. (Alluvium)						27.5
1122.6	28.8		CH - FAT CLAY; high plasticity; grayish brown mottled with yellowish red and black; saturated; medium stiff. (Alluvium)		2 2 3 (5)				
1121.9	29.5		CL - LEAN CLAY; medium plasticity; grayish brown; saturated; medium stiff to stiff; with few thin silt and fat clay seams. (Alluvium)						30.0
									32.5
1117.9	33.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light grayish brown slightly mottled with light yellowish brown; saturated; very dense. (Alluvium)		8 16 29 (45)				35.0
									37.5
1112.9	38.5		SP - POORLY GRADED SAND; 10-15% fine gravel; 80-85% fine to coarse sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)		3 6 7 (13)				
1111.4	40.0								40.0

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BORING LOG

BORING No.: B-22

SHEET 3 of 5

DATE: 11-11-2010

WATER LEVELS ▼ 12.5 on 11-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 10-15% fine gravel; 80-85% fine to coarse sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)						40.0
1108.9	42.5		CH - FAT CLAY; high plasticity; very dark grayish brown slightly mottled with dark yellowish red; saturated; stiff. (Alluvium)						42.5
1107.6	43.8		CL - LEAN CLAY; medium plasticity; dark grayish brown slightly mottled with dark yellowish red; saturated; medium stiff to stiff. (Alluvium)		2 3 5 (8)				
1106.7	44.7		CL - SANDY LEAN CLAY; 30-40% fine sand; medium plasticity; brown slightly mottled with yellowish red; saturated; stiff. (Alluvium)						45.0 47.5
1102.9	48.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light brownish gray; saturated; dense. (Alluvium)		5 11 17 (28)				50.0 52.5
1097.9	53.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		7 17 14 (31)				55.0 57.5
1092.9	58.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown with yellowish brown; saturated; medium dense. (Alluvium)		4 6 9 (15)				
1091.4	60.0								60.0

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Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75 / Hollow-Stem
CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-22

SHEET 4 of 5

DATE: 11-11-2010

WATER LEVELS ▼ 12.5 on 11-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown with yellowish brown; saturated; medium dense. (Alluvium)						60.0
1089.4	62.0		SC-SM - SILTY, CLAYEY SAND; 55-65% fine sand; low to medium plasticity; brown with light grayish brown and yellowish brown; saturated; very dense. (Alluvium)						62.5
1087.2	64.2		SM - SILTY SAND; 70-80% fine sand; low plasticity; light grayish brown with yellowish brown; saturated; very dense. (Alluvium)		12 23 24 (47)				65.0
									67.5
1082.9	68.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; light grayish brown heavily mottled with black; saturated; dense. (Alluvium)		5 10 14 (24)				70.0
									72.5
1077.9	73.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; light brownish gray mottled with black; saturated; medium dense. (Alluvium)		4 6 10 (16)				75.0
1074.4	77.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; brownish yellow; saturated; very dense. (Dakota Sandstone)						77.5
					51 49/4" (R)				
1071.4	80.0								80.0

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BORING No.: B-22

DATE: 11-11-2010

WATER LEVELS ▼ 12.5 on 11-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine sand; nonplastic; brownish yellow; saturated; very dense. (Dakota Sandstone)						80.0
									82.5
1067.9	83.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; white; saturated; very dense. (Dakota Sandstone)	◤	78 22/1" (R)				
									85.0
									87.5
1062.4	89.0			◤	100/6" (R)				
			Boring Terminated at: 89.0ft						90.0
									92.5
									95.0
									97.5
									100.0

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BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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BORING LOG

BORING No.: B-23

SHEET 1 of 5

DATE: 9-30-2010

WATER LEVELS ▽ Cave-in @ 17.5' ▼ 13.3 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1150.9	0.0		CINDERS with Sand; 20-50% fine to coarse sand; 5-10% fine to coarse gravel; black; low plasticity; moist; medium dense. (Fill)		4 5 3 2 (8)				0.0
1149.4	1.5		GP - POORLY GRADED GRAVEL with Sand; 65-75% fine to coarse gravel; 15-25% fine to coarse sand; nonplastic; black; loose. (Fill)						
1148.8	2.1		SM - SILTY SAND; 70-80% fine to coarse sand; nonplastic; black; wet; loose; with 30-40% cinders. (Fill)						2.5
1147.4	3.5		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark grayish brown; wet; medium stiff; with thin light brownish gray silt seams. (Alluvium)	40		0.7* 0.75* 0.7*	91.3	29.2	5.0
1145.4	5.5		ML - SILT; low plasticity; grayish brown; wet; very loose; with dark grayish brown clay seams. (Alluvium)		1 1 2 1 (3)				
1144.4	6.5		CL - LEAN CLAY; medium plasticity; dark grayish brown with grayish brown; wet; soft to medium stiff; with silt seams and fat clay seams. (Alluvium)						7.5
1142.4	8.5		CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; very soft. (Alluvium)		1 2 2 2 (4)				
1141.9	9.0		CL - LEAN CLAY; medium plasticity; very dark gray; wet; medium stiff. (Alluvium)						10.0
1139.4	11.5		CL - LEAN CLAY; medium plasticity; dark gray mottled with very dark grayish brown; wet; medium stiff to stiff. (Alluvium)	41		0.8* 1.0*	93.6	28.1	12.5
1138.1	12.8		CL - LEAN CLAY; medium plasticity; dark gray mottled with very dark grayish brown; wet to saturated; stiff. (Alluvium)						
1137.3	13.6		CL - LEAN CLAY; medium plasticity; gray mottled with dark yellowish red; saturated; medium stiff. (Alluvium)		1 2 3 3 (5)	1.25*			15.0
1133.9	17.0		CL - LEAN CLAY; 10-15% fine sand; medium plasticity; dark gray; saturated; soft. (Alluvium)						17.5
1130.9	20.0				0 1 2 (3)				20.0

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BORING LOG

BORING No.: B-23

DATE: 9-30-2010

WATER LEVELS ▽ Cave-in @ 17.5' ▼ 13.3 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY; 10-15% fine sand; medium plasticity; dark gray; saturated; soft. (Alluvium)						20.0
									22.5
1127.4	23.5		ML - SANDY SILT; 30-40% fine sand; low plasticity; dark gray; saturated; very loose; with silty sand and clayey sand seams. (Alluvium)	■	0 1 1 (2)				
1126.6	24.3		CH - FAT CLAY; high plasticity; gray; saturated; very soft. (Alluvium)						
1126.1	24.8		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; gray; saturated; very loose. (Alluvium)						25.0
									27.5
1122.4	28.5		CL - LEAN CLAY; medium plasticity; dark gray; saturated; medium stiff to stiff. (Alluvium)	■	3 5 10 (15)				
1121.9	29.0		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; grayish brown; saturated; medium dense. (Alluvium)						30.0
									32.5
1117.4	33.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; pale brown; saturated; dense; with clayey sand seams. (Alluvium)	■	6 11 13 (24)				
1116.3	34.6		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; light grayish brown; saturated; medium dense; with clay seams. (Alluvium)						35.0
									37.5
1112.4	38.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; gray; saturated; medium dense; with fine sand seams. (Alluvium)	■	4 8 10 (18)				
1110.9	40.0								40.0

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BORING LOG

BORING No.: B-23

SHEET 3 of 5

DATE: 9-30-2010

WATER LEVELS ▽ Cave-in @ 17.5' ▼ 13.3 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; gray; saturated; medium dense; with fine sand seams. (Alluvium)						40.0
									42.5
1107.4	43.5								
1106.9	44.0		SM - SILTY SAND; 50-60% fine sand; low plasticity; brown heavily mottled with dark yellowish red; saturated; loose. (Alluvium)		3 5				
1106.3	44.6		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine to medium sand; nonplastic; dark grayish brown; saturated; medium dense. (Alluvium)		5 (10)				
			CL - LEAN CLAY; medium plasticity; brown mottled with yellowish red; saturated; stiff. (Alluvium)						45.0
									47.5
1102.4	48.5								
			ML - SANDY SILT; 40-50% fine sand; low plasticity; pale brown slightly mottled with dark yellowish red; saturated; medium dense; with silty sand and silty clay seams. (Alluvium)		2 3 6				
1101.3	49.6								
1101.0	49.9		CH - FAT CLAY; high plasticity; very dark gray; saturated; stiff. (Alluvium)		(9)				
			SM - SILTY SAND; 55-65% fine sand; nonplastic; brown; saturated; loose. (Alluvium)						50.0
									52.5
1097.4	53.5								
			SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light yellowish brown with yellowish brown and brown; saturated; very dense. (Alluvium)		9 18 20 (38)				
									55.0
									57.5
1092.4	58.5								
			SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light yellowish brown with yellowish brown and brown; saturated; medium dense. (Alluvium)		6 7 15				
1091.4	59.5								
1090.9	60.0		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; very		(22)				60.0

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BORING No.: B-23

SHEET 4 of 5

DATE: 9-30-2010

WATER LEVELS ▽ Cave-in @ 17.5' ▼ 13.3 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			pale brown mottled with yellowish brown; saturated; dense. (Alluvium)						60.0
			SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; very pale brown mottled with yellowish brown; saturated; dense. (Alluvium)						
									62.5
1087.4	63.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; yellowish brown; saturated; dense. (Alluvium)		8 13 15 (28)				
									65.0
									67.5
1082.4	68.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; 0-5% fines, nonplastic; light yellowish brown with yellowish brown and brownish yellow; saturated; medium dense. (Alluvium)		7 11 11 (22)				
									70.0
									72.5
1077.4	73.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense; with few clay seams. (Alluvium)		6 6 8 (14)				
									75.0
									77.5
1072.4	78.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		11 18 19 (37)				
1070.9	80.0								80.0

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BORING LOG

BORING No.: B-23

SHEET 5 of 5

DATE: 9-30-2010

WATER LEVELS ▽ Cave-in @ 17.5' ▼ 13.3 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)						80.0
									82.5
1066.9	84.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Dakota Sandstone)		16 84/6" (R)				
									85.0
									87.5
					100/3.75" (R)				
									90.0
									92.5
1057.4	93.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; yellowish brown; saturated; very dense. (Dakota Sandstone)		87 13/0.25" (R)				
									95.0
									97.5
1052.4	98.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; light yellowish brown with yellowish brown; saturated; very dense. (Dakota Sandstone)		67 33/1.25" (R)				
1051.8	99.1		Boring Terminated at: 99.1ft						100.0

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CREW: CL & BB

BORING LOG

BORING No.: B-24

SHEET 1 of 5

DATE: 10-1-2010

WATER LEVELS ▼ 8.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1148.3	0.0		CL - LEAN CLAY with Sand; 15-25% fine to coarse sand; medium plasticity; grayish brown and black; wet; medium stiff to stiff; with slag. (Fill)		2 3 3 (6)				0.0
									2.5
1144.8	3.5		CL - LEAN CLAY; medium plasticity; very dark brown with grayish brown; wet; soft to medium stiff; with few thin silt seams. (Alluvium)		1 1 2 (3)				5.0
1141.8	6.5		CL - LEAN CLAY; 0-10% fine gravel; 0-5% fine to coarse sand; medium plasticity; black; wet; stiff to very stiff. (Alluvium)	42		2.25* 2.2* 1.75* 2.0*	94.4	26.5	7.5
1139.8	8.5 ▼		CL - LEAN CLAY; 5-10% fine sand; medium plasticity; very dark grayish brown; saturated; medium stiff. (Alluvium)		2 2 3 (5)				10.0
1137.8	10.5		CL - LEAN CLAY; medium plasticity; dark grayish brown; saturated; soft. (Alluvium)		0 1 1 (2)				12.5
									15.0
1131.8	16.5		SM - SILTY SAND; 65-75% fine sand; nonplastic; dark grayish brown; saturated; loose. (Alluvium)						17.5
1128.3	20.0				2 3 3 (6)				20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 29a

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BORING LOG

BORING No.: B-24

SHEET 2 of 5

DATE: 10-1-2010

WATER LEVELS ▼ 8.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 65-75% fine sand; nonplastic; dark grayish brown; saturated; loose. (Alluvium)						20.0
									22.5
1124.8	23.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light grayish brown; saturated; medium dense. (Alluvium)		3 4 8 (12)				25.0
									27.5
					6 9 10 (19)				30.0
									32.5
					3 4 5 (9)				35.0
									37.5
1109.8	38.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)		8 9 11 (20)				
1108.3	40.0								40.0

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BORING LOG

BORING No.: B-24

SHEET 3 of 5

DATE: 10-1-2010

WATER LEVELS ▼ 8.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)						40.0
									42.5
1104.8	43.5		CL - LEAN CLAY; 10-15% fine sand; medium plasticity; very dark grayish brown; saturated; stiff. (Alluvium)		1 3 4 (7)				45.0
									47.5
1099.8	48.5		ML - SILT with Sand; 15-25% fine sand; low plasticity; dark yellowish brown; saturated; loose. (Alluvium)		0 2 3 (5)				50.0
									52.5
1094.8	53.5		SM - SILTY SAND; 65-75% fine sand; nonplastic; dark grayish brown; saturated; medium dense. (Alluvium)		6 7 13 (20)				55.0
									57.5
1089.8	58.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)		10 19 21 (40)				
1088.3	60.0								60.0

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BORING LOG

BORING No.: B-24

SHEET 4 of 5

DATE: 10-1-2010

WATER LEVELS ▼ 8.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)						60.0
									62.5
1084.8	63.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; dark yellowish brown; saturated; dense. (Alluvium)		9 13 20 (33)				65.0
									67.5
1079.8	68.5		SM - SILTY SAND; 5-15% fine to coarse gravel; 60-70% fine to coarse sand; nonplastic; brown; saturated; medium dense. (Alluvium)		6 7 8 (15)				70.0
									72.5
1074.8	73.5		SC - CLAYEY SAND; 50-60% fine sand; low plasticity; light olive brown; saturated; loose. (Alluvium)		2 2 3 (5)				75.0
									77.5
1069.8	78.5		CH - FAT CLAY; high plasticity; olive brown; saturated; very stiff. (Alluvium)		5 6 6 (12)				
1068.3	80.0								80.0

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BORING No.: B-24

SHEET 5 of 5

DATE: 10-1-2010

WATER LEVELS ▼ 8.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CH - FAT CLAY; high plasticity; olive brown; saturated; very stiff. (Alluvium)						80.0
1066.8	81.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						
					100/3" (R)				82.5
									85.0
									87.5
					100/2" (R)				
									90.0
									92.5
					100/2" (R)				
1054.3	94.0		Boring Terminated at: 94.0ft						
									95.0
									97.5
									100.0

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CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-25

SHEET 1 of 5

DATE: 10-8-2010

WATER LEVELS ▽ Cave-in @ 21.5' ▼ 6.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1146.9	0.0		CL - SANDY LEAN CLAY; 35-45% fine to coarse sand; medium plasticity; black; moist; medium stiff to stiff; with cinders. (Fill)						0.0
1145.9	1.0		CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; medium stiff to stiff. (Alluvium)		2 3 3 3 (6)				
1145.3	1.6		CL/ML - SILTY CLAY; low to medium plasticity; very dark grayish brown; wet; medium stiff to stiff. (Alluvium)						
1144.6	2.3		ML - SILT; low plasticity; dark grayish brown; moist; loose. (Alluvium)						2.5
1142.9	4.0		CH - FAT CLAY; high plasticity; very dark gray; wet; soft. (Alluvium)		1 1 1 (2)				
1141.9	5.0		CH - FAT CLAY; 0-5% fine to coarse sand; high plasticity; very dark grayish brown; wet to saturated; stiff. (Alluvium)	43		1.0* 1.5*	91.7	28	5.0
1140.4	6.5		CH - FAT CLAY; 0-5% fine to coarse sand; high plasticity; very dark grayish brown; saturated; stiff. (Alluvium)			1.25*			
1139.8	7.1		CL - LEAN CLAY; medium plasticity; gray slightly mottled with very dark gray; saturated; stiff; with slight to moderate odor. (Alluvium)		1 2 4 4 (6)	2.0*			7.5
1137.4	9.5		CL - LEAN CLAY; medium plasticity; dark gray; saturated; soft; with moderate to strong odor. (Alluvium)						10.0
									12.5
1133.9	13.0		CL - LEAN CLAY; medium plasticity; gray; saturated; soft. (Alluvium)		1 1 2 2 (3)				
1132.9	14.0		CL/ML - SILTY CLAY; low to medium plasticity; gray; saturated; medium stiff. (Alluvium)						15.0
1129.9	17.0		CL/CH - LEAN TO FAT CLAY; medium to high plasticity; very dark grayish brown slightly mottled with dark yellowish red and black; saturated; medium stiff. (Alluvium)						17.5
1127.9	19.0		CH - FAT CLAY; high plasticity; very dark gray mottled with dark yellowish red; saturated; medium stiff. (Alluvium)		1 2 2 (4)				
1126.9	20.0								20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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PROJECT: Lincoln Haymarket Arena
Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75 / Hollow-Stem
CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-25

DATE: 10-8-2010

WATER LEVELS ▽ Cave-in @ 21.5' ▼ 6.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CH - FAT CLAY; high plasticity; very dark gray mottled with dark yellowish red; saturated; medium stiff. (Alluvium)						20.0
									22.5
1123.9	23.0		CL - LEAN CLAY with Sand; 15-25% fine sand; medium plasticity; dark greenish gray slightly mottled with very dark gray; saturated; soft to medium stiff. (Alluvium)	44		0.5* 0.5* 0.5* 0.4*	90.2	32.4	25.0
1120.4	26.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; gray; saturated; loose to medium dense. (Alluvium)						27.5
1118.9	28.0		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; gray; saturated; medium dense. (Alluvium)		3 3 8 (11)				30.0
									32.5
1113.4	33.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; gray; saturated; medium dense. (Alluvium)		2 6 5 (11)				
1112.4	34.5		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; gray; saturated; medium dense. (Alluvium)						35.0
1110.4	36.5		CH - FAT CLAY; high plasticity; dark gray heavily mottled with dark yellowish red; saturated; stiff to very stiff. (Alluvium)						37.5
1107.9	39.0		CH - FAT CLAY; high plasticity; very dark gray mottled with dark yellowish red; saturated; stiff. (Alluvium)		1 3 5 (8)				
1106.9	40.0								40.0

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BORING LOG

BORING No.: B-25

SHEET 3 of 5

DATE: 10-8-2010

WATER LEVELS ▽ Cave-in @ 21.5' ▼ 6.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CH - FAT CLAY; high plasticity; very dark gray mottled with dark yellowish red; saturated; stiff. (Alluvium)						40.0
1104.9	42.0		SM - SILTY SAND; 70-80% fine sand; low plasticity; very pale brown; saturated; medium dense. (Alluvium)						42.5
					3 9 16 (25)				
1102.4	44.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; light brownish gray; saturated; medium dense to dense. (Alluvium)						45.0
									47.5
					3 5 10 (15)				
1097.2	49.7		SM - SILTY SAND; 75-85% fine sand; nonplastic; grayish brown; saturated; medium dense. (Alluvium)						50.0
									52.5
1093.4	53.5		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; very pale brown with light yellowish brown; saturated; medium dense; with clayey sand seams. (Alluvium)		6 8 13 (21)				55.0
									57.5
1088.4	58.5		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; very pale brown with light yellowish brown; saturated; very dense; with clayey sand seams; with a trace of cobbles. (Alluvium)		11 26 33 (59)				
1086.9	60.0								60.0

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BORING No.: B-25

SHEET 4 of 5

DATE: 10-8-2010

WATER LEVELS ▽ Cave-in @ 21.5' ▼ 6.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; very pale brown with light yellowish brown; saturated; very dense; with clayey sand seams; with a trace of cobbles. (Alluvium)						60.0
									62.5
1083.4	63.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; very pale brown with light yellowish brown slightly mottled with yellowish red; saturated; dense; with silty sand seams. (Alluvium)		5 12 18 (30)				
1082.4	64.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; very pale brown; saturated; medium dense to dense. (Alluvium)						65.0
									67.5
1078.4	68.5		SM - SILTY SAND; 70-80% fine sand; nonplastic; light brownish gray; saturated; dense; with 3" thick clay seams. (Alluvium)		5 12 23 (35)				
1077.1	69.8		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light brownish gray; saturated; dense. (Alluvium)						70.0
1074.9	72.0		SC - CLAYEY SAND; 55-65% fine sand; nonplastic; light brownish gray heavily mottled with yellowish red; saturated; medium dense. (Alluvium)						72.5
1072.6	74.3		SM - SILTY SAND; 75-85% fine sand; nonplastic; light brownish gray heavily mottled with yellowish brown and yellowish red; saturated; medium dense; with sandy silt and clean sand seams. (Alluvium)		4 7 8 (15)				75.0
1070.4	76.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						77.5
					100/6" (R)				
1066.9	80.0								80.0

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SHEET 5 of 5

DATE: 10-8-2010

WATER LEVELS ▽ Cave-in @ 21.5' ▼ 6.5 on 10-7-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						80.0
									82.5
					100/3.75" (R)				
									85.0
									87.5
									90.0
									92.5
1053.4	93.5		Boring Terminated at: 93.5ft						
									95.0
									97.5
									100.0

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-26

SHEET 1 of 5

DATE: 10-11-2010

WATER LEVELS ▽ Cave-in @ 16.0' ▼ 2.8 on 10-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1146.5	0.0		CL - SANDY LEAN CLAY; 30-40% fine to coarse sand; medium plasticity; black; moist to wet; medium stiff; with brick and cinders. (Fill)		2 2 1 2 (3)				0.0
1145.0	1.5		SM - SILTY SAND; 10-15% fine to coarse gravel; 70-80% fine to coarse sand; nonplastic; black; wet; very loose. (Fill)						
1144.3	2.2		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; soft; with abundant organics; with strong odor. (Alluvium)						2.5
1143.5	3.0		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; medium stiff. (Alluvium)		1 2 2 2 (4)				5.0
1141.0	5.5		CH - FAT CLAY; high plasticity; very dark gray with dark gray; saturated; medium stiff; with abundant lime nodules. (Alluvium)		1 2 1 2 (3)				
1139.7	6.8		CL - LEAN CLAY; medium plasticity; dark gray; saturated; soft to medium stiff; with lime nodules. (Alluvium)						7.5
1139.1	7.4		CL - LEAN CLAY; medium plasticity; greenish gray; saturated; medium stiff. (Alluvium)		1 2 1 (3)				
1137.0	9.5		CL/ML - SILTY CLAY; low to medium plasticity; greenish gray; saturated; soft. (Alluvium)			1.25*			10.0
1136.5	10.0		ML - SILT; low plasticity; greenish gray; saturated; loose; with strong diesel fuel odor. (Alluvium)	45		1.25* 0.5* 0.3*	93.9	28.9	
1134.5	12.0		ML - SILT; low plasticity; greenish gray; saturated; very loose. (Alluvium)		0 0 1 1 (1)				12.5
1131.5	15.0		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; gray; saturated; loose. (Alluvium)						15.0
									17.5
1127.8	18.7		CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff to stiff. (Alluvium)		2 2 4 (6)				
1126.5	20.0								20.0

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CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-26

SHEET 2 of 5

DATE: 10-11-2010

WATER LEVELS ▽ Cave-in @ 16.0' ▼ 2.8 on 10-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff to stiff. (Alluvium)						20.0
									22.5
1123.0	23.5		CL - LEAN CLAY; medium plasticity; very dark gray; saturated; very soft; with wood fragments. (Alluvium)		0 0 1 (1)				25.0
1120.0	26.5		CH - FAT CLAY; high plasticity; dark gray; saturated; soft. (Alluvium)						27.5
1117.5	29.0				1				
1117.1	29.4		CL - LEAN CLAY; 5-10% fine sand; medium plasticity; dark gray; saturated; medium stiff. (Alluvium)		2 5 (7)				
1117.0	29.5		CH - FAT CLAY; high plasticity; dark gray; saturated; stiff. (Alluvium)						30.0
			ML - SANDY SILT; 35-45% fine sand; low plasticity; dark gray; saturated; loose. (Alluvium)						32.5
1113.0	33.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; very pale brown mottled with yellowish red; saturated; dense. (Alluvium)		6 12 13 (25)				35.0
1109.0	37.5		CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff. (Alluvium)						37.5
1107.4	39.1				2 3 4 (7)				
1106.7	39.8		CL - LEAN CLAY with Sand; 20-30% fine sand; medium plasticity; very dark grayish brown mottled with yellowish red; saturated; stiff. (Alluvium)						40.0

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BORING LOG

BORING No.: B-26

SHEET 3 of 5

DATE: 10-11-2010

WATER LEVELS ▽ Cave-in @ 16.0' ▼ 2.8 on 10-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1106.5	40.0		SC-SM - SILTY, CLAYEY SAND; 55-65% fine sand; low to medium plasticity; grayish brown with brown mottled with yellowish red; saturated; medium dense. (Alluvium)						40.0
1105.5	41.0		SM - SILTY SAND; 70-80% fine sand; low plasticity; light brown; saturated; loose; with sandy silt seams. (Alluvium)						42.5
1102.0	44.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; very pale brown with light yellowish brown; saturated; medium dense; with a trace of coarse sand. (Alluvial Clay)		2 3 5 (8)				45.0
									47.5
1098.0	48.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown with very pale brown mottled with yellowish red; saturated; dense; with few 2.5" thick fat clay seams. (Alluvium)		4 6 18 (24)				50.0
									52.5
1093.0	53.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; very pale brown; saturated; very dense. (Alluvium)		23 33 31 (64)				
1091.7	54.8		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; very pale brown; saturated; very dense. (Alluvium)						55.0
									57.5
1088.0	58.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Alluvium)		18 30 36 (66)				
1086.5	60.0								60.0

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BORING LOG

BORING No.: B-26

SHEET 4 of 5

DATE: 10-11-2010

WATER LEVELS ▽ Cave-in @ 16.0' ▼ 2.8 on 10-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Alluvium)						60.0
									62.5
1083.0	63.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		9 15 17 (32)				65.0
									67.5
1078.0	68.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; brownish yellow; saturated; very dense. (Alluvium)		26 34 43 (77)				
1077.1	69.4		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; very dense. (Alluvium)						70.0
									72.5
1073.0	73.5		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)		17 36 47/5" (R)				75.0
1070.5	76.0		SP - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						77.5
					100/4.75" (R)				
1066.5	80.0								80.0

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Figure C - 31d

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BORING LOG

BORING No.: B-26

SHEET 5 of 5

DATE: 10-11-2010

WATER LEVELS ▽ Cave-in @ 16.0' ▼ 2.8 on 10-12-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						80.0
									82.5
1063.0	83.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)		00/3.75" (R)				
1062.6	83.9		Boring Terminated at: 83.9ft						
									85.0
									87.5
									90.0
									92.5
									95.0
									97.5
									100.0

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CREW: CL, BB & JL

BORING LOG

BORING No.: B-27

SHEET 1 of 5

DATE: 9-27-2010

WATER LEVELS ▽ Cave-in @ 13.8' ▼ 5.0 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1149.7	0.0	SM - SILTY SAND; 0-5% fine to coarse gravel; 70-80% fine to coarse sand; 20-30% fines, low plasticity; black slightly mottled with yellowish red; moist; loose; with 10-20% cinders. (Fill)		3 2 2 (4)				0.0
								2.5
1146.0	3.7	CL - LEAN CLAY; 0-5% fine sand; medium plasticity; grayish brown mottled with dark yellowish red and black; wet; soft to medium stiff. (Fill)		1 1 2 (3)				
1144.7	5.0	CL - LEAN CLAY; 0-5% fine sand; medium plasticity; grayish brown mottled with dark yellowish red and black; saturated; soft to medium stiff; with a trace of brick rubble. (Fill)						5.0
1143.7	6.0	CL - LEAN CLAY; medium plasticity; black; saturated; medium stiff; with silty sand seams. (Alluvium)		1 1 1 (2)				
								7.5
				1 1 2 (3)				
1139.7	10.0	CL - LEAN CLAY; 5-10% fine to medium sand; medium plasticity; very dark gray; saturated; medium stiff to stiff; with strong diesel fuel odor. (Alluvium)	46		1.0* 1.25* 0.7*	83.2	35.3	10.0
								12.5
1136.2	13.5	CH - FAT CLAY; high plasticity; dark olive gray slightly mottled with white; saturated; stiff. (Alluvium)		2 2 3 (5)				
								15.0
								17.5
1131.7	18.0	CH - FAT CLAY with Sand; 15-25% fine sand; high plasticity; dark gray mottled with dark reddish brown; saturated; stiff. (Alluvium)		3 3 4 (7)				
1129.7	20.0							20.0

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BORING No.: B-27

SHEET 2 of 5

DATE: 9-27-2010

WATER LEVELS ▽ Cave-in @ 13.8' ▼ 5.0 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY with Sand; 15-20% fine sand; medium plasticity; dark greenish gray slightly mottled with yellowish brown; saturated; stiff to very stiff. (Alluvium)	47		2.25* 2.0*	104.0	21.3	20.0
1127.7	22.0		SM - SILTY SAND; 70-80% fine sand; 20-30% fines, nonplastic; dark gray; saturated; loose; with clayey sand seams. (Alluvium)		2 2 2 (4)				22.5 25.0
1121.7	28.0		CL - SANDY LEAN CLAY; 30-40% fine sand; medium plasticity; dark gray; saturated; medium stiff. (Alluvium)						27.5
1120.8	28.9		SP - POORLY GRADED SAND; fine sand; gray; saturated; medium dense. (Alluvium)		8 10 16 (26)				30.0 32.5
1115.2	34.5		SP - POORLY GRADED SAND; fine to medium sand; olive; saturated; medium dense. (Alluvium)		9 12 15 (27)				35.0 37.5
1111.7	38.0		SC - CLAYEY SAND; 0-5% fine gravel; 50-60% fine to coarse sand; 40-50% fines, medium plasticity; gray; saturated; medium dense. (Alluvium)		2 9 10 (19)				
1110.2	39.5		SP - POORLY GRADED SAND; fine to coarse sand; nonplastic; very pale brown;						40.0
1109.7	40.0								

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: CL, BB & JL

BORING LOG

BORING No.: B-27

SHEET 3 of 5

DATE: 9-27-2010

WATER LEVELS ▽ Cave-in @ 13.8' ▼ 5.0 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			saturated; medium dense. (Alluvium)						40.0
			SP - POORLY GRADED SAND; fine to coarse sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)						
									42.5
1106.2	43.5		SC - CLAYEY SAND; 50-60% fine to medium sand; 40-50% fines, medium plasticity; grayish brown; saturated; medium dense. (Alluvium)		18				
1105.7	44.0		SP - POORLY GRADED SAND; fine sand; light yellowish brown mottled with yellowish red; saturated; dense to very dense. (Alluvium)		28 22 (50)				45.0
									47.5
1101.2	48.5		SP - POORLY GRADED SAND; fine to medium sand; yellowish brown; saturated; dense. (Alluvium)		4 12 20 (32)				50.0
									52.5
1095.7	54.0		CL - LEAN CLAY; 5-15% fine sand; medium plasticity; gray; saturated; stiff. (Alluvium)		1 8 12 (20)				
1095.2	54.5		SP - POORLY GRADED SAND; fine to coarse sand; yellowish red; saturated; medium dense. (Alluvium)						55.0
									57.5
1091.2	58.5		SP - POORLY GRADED SAND; fine sand; gray; saturated; medium dense. (Alluvium)		6 12 20 (32)				
1090.2	59.5		SP - POORLY GRADED SAND; fine to coarse sand; olive; saturated; dense.						
1089.7	60.0								60.0

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BORING LOG

BORING No.: B-27

SHEET 4 of 5

DATE: 9-27-2010

WATER LEVELS ▽ Cave-in @ 13.8' ▼ 5.0 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			(Alluvium)						60.0
			SP - POORLY GRADED SAND; fine to coarse sand; olive; saturated; dense. (Alluvium)						62.5
1086.2	63.5		SP - POORLY GRADED SAND; 0-5% fine gravel; fine to medium sand; light yellowish brown; saturated; medium dense. (Alluvium)		4 6 9 (15)				65.0
									67.5
1081.2	68.5		SP - POORLY GRADED SAND; fine sand; light yellowish brown; saturated; dense. (Alluvium)		8 15 18 (33)				70.0
									72.5
1076.2	73.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines, nonplastic; grayish brown with gray; saturated; medium dense. (Alluvium)		13 15 14 (29)				75.0
									77.5
1071.7	78.0		SP-SM - POORLY GRADED SAND with Silt; 5-10% fine gravel; 80-90% fine to coarse sand; 5-15% fines, nonplastic; strong brown; saturated; medium dense. (Alluvium)		13 15 63 (78)				
1070.2	79.5								
1069.7	80.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines,						80.0

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BORING LOG

BORING No.: B-27

SHEET 5 of 5

DATE: 9-27-2010

WATER LEVELS ▽ Cave-in @ 13.8' ▼ 5.0 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			nonplastic; light yellowish brown; saturated; very dense. (Dakota Sandstone)						80.0
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines, nonplastic; light yellowish brown; saturated; very dense. (Dakota Sandstone)						
									82.5
1066.2	83.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines, nonplastic; light yellowish brown; saturated; very dense. (Dakota Sandstone)		100/6" (R)				
									85.0
									87.5
1061.2	88.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; 5-15% fines, nonplastic; strong brown; saturated; very dense. (Dakota Sandstone)		100/3" (R)				
									90.0
									92.5
1056.2	93.5		SM - SILTY SAND; 75-85% fine sand; 15-25% fines, nonplastic; dark brown with strong brown; saturated; very dense. (Dakota Sandstone)		00/4.75" (R)				
1055.8	93.9		Boring Terminated at: 93.9ft						
									95.0
									97.5
									100.0

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 32e

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CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-28

SHEET 1 of 5

DATE: 11-11-2010

WATER LEVELS ▼ 12.4 on 11-11-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1152.5	0.0	CL - LEAN CLAY with Sand; 20-30% fine to coarse sand; medium plasticity; black; wet; medium stiff. (Fill)						0.0
1152.1	0.4							
1151.5	1.0	CL - SANDY LEAN CLAY; 0-5% fine to coarse gravel; 40-45% fine to coarse sand; medium plasticity; dark grayish brown with very dark grayish brown; wet; medium stiff to stiff. (Fill)						
		GM - SILTY GRAVEL with Sand; 50-60% fine to coarse gravel; 15-25% fine to coarse sand; 15-25% fines, medium plasticity; very dark grayish brown; wet; loose to medium dense; with a trace of cobbles. (Fill)						
1149.8	2.7	CL - LEAN CLAY with Sand; 0-5% fine to coarse gravel; 15-25% fine to coarse sand; medium plasticity; dark greenish gray with dark yellowish brown and black; wet; stiff; with strong fuel odor. (Fill)	48		2.25* 1.25* 1.0*	100.8	19.9	2.5
1147.5	5.0	CL - SANDY LEAN CLAY; 30-40% fine sand; medium plasticity; dark greenish gray with black; wet; medium stiff. (Fill)		1 1 2 2 (3)				5.0 7.5
1144.0	8.5							
1143.5	9.0	SC - CLAYEY SAND; 50-60% fine sand; medium plasticity; very dark gray; wet; loose. (Alluvium)		0 1 2 2 (3)				10.0
		CL - SANDY LEAN CLAY; 40-50% fine sand; medium plasticity; very dark gray; wet; medium stiff; with clayey sand seams. (Alluvium)						
1141.5	11.0							
1141.0	11.5	SC - CLAYEY SAND; 60-70% fine sand; medium plasticity; dark greenish gray; wet; medium dense. (Alluvium)		3 5 3 2 (8)				
1140.2	12.3	SM - SILTY SAND; 75-85% fine sand; low plasticity; dark greenish gray; wet; medium dense. (Alluvium)						12.5
		SC - CLAYEY SAND; 50-60% fine sand; medium plasticity; dark greenish gray; wet; loose. (Alluvium)						
1139.0	13.5							
1138.3	14.2	SM - SILTY SAND; 70-80% fine sand; low plasticity; dark greenish gray; saturated; very loose. (Alluvium)		1 1 1 1 (2)				
		SC-SM - SILTY, CLAYEY SAND; 60-70% fine sand; low to medium plasticity; dark greenish gray; saturated; very loose. (Alluvium)						15.0
1136.0	16.5	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; dark gray; saturated; medium dense. (Alluvium)		3 5 9 8 (14)				17.5
1132.5	20.0							20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 33a

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CREW: CL, LDI & GBW

BORING LOG

BORING No.: B-28

DATE: 11-11-2010

WATER LEVELS ▼ 12.4 on 11-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; dark gray; saturated; medium dense. (Alluvium)						20.0
									22.5
1129.0	23.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; light grayish brown with light yellowish brown mottled with dark yellowish red and black; saturated; dense. (Alluvium)		7 12 14 (26)				25.0
									27.5
1124.5	28.0		CH - FAT CLAY; high plasticity; very dark grayish brown slightly mottled with dark red; saturated; stiff. (Alluvium)		3 5 7 (12)				
1123.4	29.1								
1123.0	29.5		CL - LEAN CLAY; medium plasticity; grayish brown slightly mottled with yellowish red; saturated; stiff. (Alluvium)						
			ML - SILT; 0-5% fine sand; low plasticity; light grayish brown slightly mottled with yellowish red; saturated; medium dense. (Alluvium)						30.0
									32.5
1119.0	33.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; light grayish brown with yellowish brown; saturated; medium dense. (Alluvium)		3 4 9 (13)				35.0
									37.5
1114.0	38.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light brownish gray slightly mottled with yellowish red; saturated; very dense. (Alluvium)		5 18 22 (40)				
1112.5	40.0								40.0

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BORING LOG

BORING No.: B-28

SHEET 3 of 5

DATE: 11-11-2010

WATER LEVELS ▼ 12.4 on 11-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light brownish gray slightly mottled with yellowish red; saturated; very dense. (Alluvium)						40.0
									42.5
1109.0	43.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; light brownish gray; saturated; medium dense. (Alluvium)		5 8 8 (16)				45.0
									47.5
1104.0	48.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; brown with dark grayish brown and dark gray slightly mottled with yellowish red; saturated; dense. (Alluvium)		7 12 13 (25)				50.0
									52.5
1099.0	53.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; very pale brown mottled with yellowish red; saturated; medium dense. (Alluvium)		8 11 7 (18)				
1097.7	54.8		CL/ML - SILTY CLAY; low plasticity; dark grayish brown; saturated; very stiff. (Alluvium)						55.0
									57.5
1094.0	58.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; pale brown with light yellowish brown; saturated; dense; with few thin clay seams. (Alluvium)		4 6 19 (25)				
1092.5	60.0								60.0

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BORING LOG

BORING No.: B-28

SHEET 4 of 5

DATE: 11-11-2010

WATER LEVELS ▼ 12.4 on 11-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; pale brown with light yellowish brown; saturated; dense; with few thin clay seams. (Alluvium)						60.0
1090.0	62.5		SC-SM - SILTY, CLAYEY SAND; 55-65% fine sand; low to medium plasticity; grayish brown mottled with yellowish red and brownish yellow; saturated; very dense. (Alluvium)						62.5
					12 27 30 (57)				65.0
									67.5
1084.0	68.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; yellowish brown with brownish yellow; saturated; dense. (Alluvium)		10 15 22 (37)				70.0
									72.5
					11 19 31 (50)				75.0
1078.0	74.5		SP - POORLY GRADED SAND; 5-10% fine gravel; 85-90% fine to coarse sand; nonplastic; brownish yellow; saturated; very dense. (Alluvium)						
1076.0	76.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow with white; saturated; very dense. (Dakota Sandstone)						77.5
					100/4.25" (R)				
1072.5	80.0								80.0

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BORING No.: B-28

SHEET 5 of 5

DATE: 11-11-2010

WATER LEVELS ▼ 12.4 on 11-11-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow with white; saturated; very dense. (Dakota Sandstone)						80.0
									82.5
1069.0	83.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; white; saturated; very dense. (Dakota Sandstone)		100/5.5" (R)				
									85.0
									87.5
1063.5	89.0		Boring Terminated at: 89.0ft		100/5" (R)				
									90.0
									92.5
									95.0
									97.5
									100.0

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BORING LOG

BORING No.: B-29

SHEET 1 of 5

DATE: 9-30-2010

WATER LEVELS ▽ Cave-in @ 18.2' ▼ 13.0 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1151.0	0.0	CINDERS with Sand; 20-30% fine sand; 15-20% fine to coarse gravel; 15-25% fines, low plasticity; black; moist; medium dense. (Fill)		4 4 4				0.0
1149.2	1.8	SM - SILTY SAND; 70-80% fine sand; nonplastic; dark brown with black; moist; loose; with a trace of coarse sand and cinders. (Fill)		3 (8)				2.5
1148.2	2.8	CL - LEAN CLAY; 0-5% fine to coarse sand; medium plasticity; dark brown; wet; soft to medium stiff. (Fill)						
1147.5	3.5	CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; medium stiff to stiff. (Alluvium)		1 3 4				
1146.3	4.7	ML - SILT; low plasticity; dark grayish brown; wet; medium dense. (Alluvium)		4 (7)				5.0
1144.5	6.5	CL - LEAN CLAY; medium plasticity; dark grayish brown; wet; stiff; with thin light brownish gray silt seams. (Alluvium)	49		1.25*	91.4	29.1	7.5
1143.2	7.8	CL - LEAN CLAY; medium plasticity; dark grayish brown; wet; medium stiff; with thin light brownish gray silt seams. (Alluvium)			0.9*			
1142.5	8.5	CH - FAT CLAY; high plasticity; very dark gray; wet; medium stiff. (Alluvium)		0 2 2	0.75*			
1141.0	10.0	CL - LEAN CLAY; medium plasticity; very dark gray mottled with dark gray slightly mottled with black; wet; medium stiff. (Alluvium)		2 (4)				10.0
1139.3	11.7	CH - FAT CLAY; high plasticity; dark gray mottled with gray and very dark gray and yellowish red; wet to saturated; medium stiff. (Alluvium)		1 2 2				12.5
1138.0	13.0			2				
1137.5	13.5	CH - FAT CLAY; high plasticity; dark gray mottled with gray and very dark gray and yellowish red; saturated; medium stiff. (Alluvium)		(4)				
		CL - LEAN CLAY; medium plasticity; dark grayish brown; saturated; medium stiff. (Alluvium)		1 1 2 2 (3)				15.0
1134.5	16.5							
1134.3	16.7	CL - LEAN CLAY with Sand; 20-30% fine sand; medium plasticity; grayish brown slightly mottled with dark yellowish brown; saturated; medium stiff. (Alluvium)			0.5*			
1134.0	17.0							
1133.5	17.5	SC - CLAYEY SAND; 60-70% fine sand; low plasticity; grayish brown; saturated; loose. (Alluvium)	50		0.5*	107.6	17.9	17.5
1132.5	18.5	CL - LEAN CLAY; 5-10% fine sand; medium plasticity; grayish brown slightly mottled with dark yellowish brown; saturated; medium stiff. (Alluvium)			0.25*			
1132.0	19.0	SC - CLAYEY SAND; 60-70% fine sand; low plasticity; dark grayish brown; saturated; loose. (Alluvium)		1 2				
1131.6	19.4	SM - SILTY SAND; 65-75% fine sand; low plasticity; grayish brown; saturated; loose. (Alluvium)		5 (7)				
1131.0	20.0							20.0

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BORING LOG

BORING No.: B-29

SHEET 2 of 5

DATE: 9-30-2010

WATER LEVELS ▽ Cave-in @ 18.2' ▼ 13.0 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL/ML - SILTY CLAY; low to medium plasticity; brown; saturated; medium stiff. (Alluvium)						20.0
			SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)						22.5
1127.5	23.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; very pale brown; saturated; medium dense; with a trace of coarse sand. (Alluvium)		4 5 5 (10)				25.0
1124.0	27.0		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; dark gray; saturated; medium dense; with a trace of coarse sand. (Alluvium)						27.5
1122.5	28.5		CL - SANDY LEAN CLAY; 40-50% fine to coarse sand; medium plasticity; very dark gray; saturated; soft. (Alluvium)		1 1 1 (2)				
1122.0	29.0		CL - LEAN CLAY with Sand; 0-5% fine gravel; 15-25% fine to coarse sand; medium plasticity; very dark gray; saturated; soft. (Alluvium)						
1121.2	29.8		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; dark grayish brown; saturated; very loose. (Alluvium)						30.0
									32.5
1117.5	33.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; gray; saturated; medium dense. (Alluvium)		6 11 14 (25)				35.0
									37.5
1111.0	40.0				5 7 8 (15)				40.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

Figure C - 34b

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CREW: CL & GBW

BORING LOG

BORING No.: B-29

SHEET 3 of 5

DATE: 9-30-2010

WATER LEVELS ▽ Cave-in @ 18.2' ▼ 13.0 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; gray; saturated; medium dense. (Alluvium)						40.0
									42.5
1107.5	43.5								
1107.2	43.8		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; brown; saturated; loose. (Alluvium)		3				
1107.0	44.0		CH - FAT CLAY; high plasticity; brown; saturated; medium stiff to stiff. (Alluvium)		3				
			ML - SILT; low plasticity; light grayish brown with brown mottled with yellowish red; saturated; loose. (Alluvium)		3 (6)				45.0
									47.5
1102.5	48.5		SM - SILTY SAND; 70-80% fine sand; nonplastic; brown mottled with yellowish red; saturated; medium dense. (Alluvium)		4				
1101.7	49.3		ML - SILT; 5-10% fine sand; low plasticity; grayish brown mottled with dark yellowish red; saturated; medium dense; with clay seams. (Alluvium)		9 12 (21)				50.0
									52.5
1097.5	53.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown; saturated; medium dense. (Alluvium)		9				
1097.0	54.0		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light yellowish brown; saturated; dense. (Alluvium)		11 12 (23)				55.0
									57.5
1092.5	58.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown with light yellowish brown; saturated; dense. (Alluvium)		10 16 16 (32)				
1091.0	60.0								60.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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PROJECT: Lincoln Haymarket Arena
Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: CL & GBW

BORING LOG

BORING No.: B-29

SHEET 4 of 5

DATE: 9-30-2010

WATER LEVELS ▽ Cave-in @ 18.2' ▼ 13.0 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown with light yellowish brown; saturated; dense. (Alluvium)						60.0
									62.5
1087.5	63.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; brown; saturated; dense; with few clay seams. (Alluvium)		10 13 13 (26)				65.0
									67.5
1082.5	68.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light yellowish brown; saturated; medium dense. (Alluvium)		8 12 14 (26)				70.0
									72.5
1077.5	73.5		SP-SM - POORLY GRADED SAND with Silt; 0-5% fine to coarse gravel; 85-90% fine sand; nonplastic; light yellowish brown mottled with yellowish red; saturated; very dense. (Alluvium)		14 19 36 (55)				75.0
									77.5
1072.5	78.5		SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; brownish yellow with light yellowish brown and brown; saturated; dense. (Alluvium)		13 16 17 (33)				
1071.0	80.0								80.0

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BORING LOG

BORING No.: B-29

SHEET 5 of 5

DATE: 9-30-2010

WATER LEVELS ▽ Cave-in @ 18.2' ▼ 13.0 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 10-15% fine to coarse gravel; 80-85% fine to coarse sand; nonplastic; brownish yellow with light yellowish brown and brown; saturated; dense. (Alluvium)						80.0
1069.0	82.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						82.5
					100/5" (R)				
									85.0
									87.5
1062.5	88.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale yellow to white; saturated; very dense. (Dakota Sandstone)		100/3.25" (R)				
									90.0
									92.5
					100/4" (R)				
1057.1	93.9		Boring Terminated at: 93.9ft						
									95.0
									97.5
									100.0

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CREW: BB & LDI

BORING LOG

BORING No.: B-30

SHEET 1 of 5

DATE: 10-6-2010

WATER LEVELS ▽ Cave-in @ 19.0' ▼ 10.1 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1148.5	0.0	CL - LEAN CLAY with Sand; 5-10% fine to coarse gravel; 15-25% fine to coarse sand; medium plasticity; black; wet; medium stiff to stiff. (Fill)		3 3 3 (6)				0.0
								2.5
1145.0	3.5	CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark olive brown; wet; soft to medium stiff. (Alluvium)		1 1 2 (3)				5.0
1142.0	6.5	CH - FAT CLAY; high plasticity; black; wet; stiff. (Alluvium)	51		2.75* 1.75* 2.25*	95.2	25.3	7.5
1139.9	8.6	CH - FAT CLAY; 0-5% fine to medium sand; high plasticity; very dark grayish brown slightly mottled with dark olive brown; wet to saturated; medium stiff. (Alluvium)		1 2 3 (5)	2.25*			
1138.4	10.1							10.0
1138.0	10.5	CH - FAT CLAY; 0-5% fine to medium sand; high plasticity; very dark grayish brown slightly mottled with dark olive brown; saturated; medium stiff. (Alluvium)						
		CL - LEAN CLAY; medium plasticity; olive brown; saturated; medium stiff. (Alluvium)		1 2 3 (5)				12.5
1135.3	13.2	SC - CLAYEY SAND; 50-60% fine sand; low plasticity; olive brown; saturated; very loose. (Alluvium)		1 1 1 (2)				
1133.5	15.0	CL - SANDY LEAN CLAY; 35-45% fine to medium sand; medium plasticity; grayish brown slightly mottled with dark yellowish brown; saturated; soft. (Alluvium)	52		0.25*			15.0
1132.7	15.8							
1132.2	16.3	SM - SILTY SAND; 65-75% fine sand; nonplastic; grayish brown; saturated; loose. (Alluvium)			0.3*	93.0	30.2	
1131.5	17.0	CL - LEAN CLAY; 10-15% fine sand; medium plasticity; grayish brown; saturated; soft. (Alluvium)			0.5*			
		CL - LEAN CLAY; medium plasticity; olive brown; saturated; medium stiff. (Alluvium)						17.5
1129.5	19.0			1 2 2 (4)				
1129.0	19.5	SM - SILTY SAND; 70-80% fine sand; nonplastic; dark yellowish brown; saturated; loose. (Alluvium)						
1128.5	20.0	CL - LEAN CLAY; medium plasticity; olive brown; saturated; medium stiff.						20.0

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CREW: BB & LDI

BORING LOG

BORING No.: B-30

SHEET 2 of 5

DATE: 10-6-2010

WATER LEVELS ▽ Cave-in @ 19.0' ▼ 10.1 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			(Alluvium)						20.0
			CL - LEAN CLAY; medium plasticity; olive brown; saturated; medium stiff. (Alluvium)						
									22.5
1125.0	23.5		SM - SILTY SAND; 75-85% fine to medium sand; nonplastic; light gray; saturated; loose. (Alluvium)		1 2 3 (5)				
									25.0
									27.5
1120.0	28.5		SM - SILTY SAND; 75-85% fine to medium sand; nonplastic; light gray; saturated; medium dense. (Alluvium)		4 6 5 (11)				
									30.0
									32.5
					6 7 8 (15)				
									35.0
									37.5
1110.0	38.5		CL - LEAN CLAY; medium plasticity; grayish brown; saturated; stiff to very stiff. (Alluvium)		4 9 11 (20)				
1109.5	39.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; dark yellowish brown; saturated; medium dense. (Alluvium)						
1108.5	40.0								40.0

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Figure C - 35b

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SHEET 3 of 5

DATE: 10-6-2010

WATER LEVELS ▽ Cave-in @ 19.0' ▼ 10.1 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine sand; nonplastic; dark yellowish brown; saturated; medium dense. (Alluvium)						40.0
									42.5
					7 12 14 (26)				45.0
									47.5
1100.0	48.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; gray; saturated; dense. (Alluvium)		12 16 19 (35)				50.0
									52.5
					7 12 13 (25)				55.0
									57.5
1090.0	58.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)		8 16 23 (39)				60.0
1088.5	60.0								

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BORING No.: B-30

SHEET 4 of 5

DATE: 10-6-2010

WATER LEVELS ▽ Cave-in @ 19.0' ▼ 10.1 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to coarse sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)						60.0
									62.5
1085.0	63.5		SM - SILTY SAND; 75-85% fine to medium sand; nonplastic; light yellowish brown; saturated; dense; with few thin clay seams. (Alluvium)		7 12 14 (26)				65.0
									67.5
1080.0	68.5		SP-SM - POORLY GRADED SAND with Silt; 0-5% fine to coarse gravel; 80-90% fine to coarse sand; nonplastic; dark yellowish brown; saturated; medium dense; with few thin clay seams. (Alluvium)		6 10 10 (20)				70.0
									72.5
1075.0	73.5		SM - SILTY SAND; 75-85% fine sand; nonplastic; yellowish brown; saturated; very dense. (Alluvium)		13 26 31 (57)				75.0
1072.5	76.0		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; grayish brown; saturated; very dense. (Dakota Sandstone)						77.5
					100/6" (R)				
1068.5	80.0								80.0

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SHEET 5 of 5

DATE: 10-6-2010

WATER LEVELS ▽ Cave-in @ 19.0' ▼ 10.1 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; grayish brown; saturated; very dense. (Dakota Sandstone)						80.0
									82.5
					100/3" (R)				
1063.7	84.8		Boring Terminated at: 84.8ft						85.0
									87.5
									90.0
									92.5
									95.0
									97.5
									100.0

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CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-31

SHEET 1 of 5

DATE: 10-8-2010

WATER LEVELS ▽ Cave-in @ 13.0' ▼ 7.5 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1148.1	0.0	CINDERS with Sand; 30-40% fine to coarse sand; 5-10% fine to coarse gravel; 20-30% fines, medium plasticity; black; moist; loose. (Fill)		2 3 4 4 (7)				0.0
1146.8	1.3	CL - LEAN CLAY; medium plasticity; very dark grayish brown; wet; stiff. (Alluvium)						
1145.3	2.8	CL/ML - SILTY CLAY; low to medium plasticity; dark gray; wet; very soft. (Alluvium)						2.5
1144.6	3.5	CL - LEAN CLAY; medium plasticity; dark gray; wet; very soft; with silt seams. (Alluvium)		0 0 1 2 (1)				
1143.9	4.2	CH - FAT CLAY; high plasticity; very dark gray; wet to saturated; soft to medium stiff. (Alluvium)						5.0
1140.6	7.5			1 2 2 2 (4)				7.5
1139.6	8.5	CH - FAT CLAY; high plasticity; very dark gray; saturated; soft to medium stiff. (Alluvium)						
1138.1	10.0	CL - LEAN CLAY; medium plasticity; gray with greenish gray; saturated; medium stiff; with moderate odor. (Alluvium)		1 2 2 (4)				10.0
1136.6	11.5	CL - LEAN CLAY; medium plasticity; greenish gray slightly mottled with very dark grayish brown; saturated; medium stiff; with few thin silty sand seams; with very strong fuel odor. (Alluvium)	53		0.75*	99.8	22	
1136.1	12.0	CL - LEAN CLAY; medium plasticity; greenish gray slightly mottled with very dark grayish brown; saturated; medium stiff to stiff; with few thin silty sand seams; with very strong fuel odor. (Alluvium)			1.25*			
1135.6	12.5	CL - LEAN CLAY; medium plasticity; greenish gray; saturated; medium stiff to stiff. (Alluvium)		3 3 2 3 (5)	1.0*			12.5
		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very dark gray; saturated; loose; with moderate odor. (Alluvium)						15.0
1132.1	16.0	CH - FAT CLAY; high plasticity; very dark gray; saturated; stiff. (Alluvium)						17.5
1129.6	18.5	CH - FAT CLAY; high plasticity; dark gray mottled with very dark gray and dark greenish gray; saturated; medium stiff to stiff. (Alluvium)		2 2 4 5 (6)				
1128.9	19.2	SM - SILTY SAND; 70-80% fine sand; low plasticity; greenish gray; saturated; medium dense. (Alluvium)						
1128.1	20.0							20.0

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CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-31

DATE: 10-8-2010

WATER LEVELS ▽ Cave-in @ 13.0' ▼ 7.5 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 70-80% fine sand; low plasticity; greenish gray; saturated; medium dense. (Alluvium)						20.0
1126.6	21.5		CL - LEAN CLAY; 10-15% fine sand; medium plasticity; dark greenish gray; saturated; medium stiff. (Alluvium)						
1125.5	22.6		CL - SANDY LEAN CLAY; 35-45% fine sand; medium plasticity; dark greenish gray; saturated; soft to medium stiff. (Alluvium)	54		0.8* 0.5*	96.7	27	22.5
1124.7	23.4		SM - SILTY SAND; 70-80% fine sand; low plasticity; gray with dark gray; saturated; very loose to loose. (Alluvium)		2 1 3 2				25.0
1122.6	25.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; gray; saturated; loose. (Alluvium)		(4)				27.5
1119.6	28.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; gray; saturated; medium dense; with a trace of coarse sand; with moderate odor. (Alluvium)		3 4 5 (9)				30.0
									32.5
1114.6	33.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; light brownish gray; saturated; medium dense. (Alluvium)		4 9 10 (19)				35.0
1111.1	37.0		CH - FAT CLAY; high plasticity; very dark brown heavily mottled with light yellowish brown slightly mottled with yellowish red; saturated; stiff to very stiff. (Alluvium)						37.5
1108.6	39.5		CH - FAT CLAY; high plasticity; very dark gray mottled with dark yellowish red;		2 3 5 (8)				
1108.1	40.0								40.0

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BORING No.: B-31

SHEET 3 of 5

DATE: 10-8-2010

WATER LEVELS ▽ Cave-in @ 13.0' ▼ 7.5 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
		saturated; stiff. (Alluvium)						40.0
		CH - FAT CLAY; high plasticity; very dark gray mottled with dark yellowish red; saturated; stiff. (Alluvium)						
1106.1	42.0	CL - SANDY LEAN CLAY; 40-50% fine sand; medium plasticity; brown; saturated; medium stiff to stiff. (Alluvium)						42.5
1104.1	44.0			1				
1103.6	44.5	SC - CLAYEY SAND; 50-60% fine sand; low plasticity; brown mottled with dark yellowish brown; saturated; loose. (Alluvium)		3				
1103.2	44.9	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; brown; saturated; medium dense. (Alluvium)		4 (7)				45.0
		ML - SANDY SILT; 40-50% fine sand; low plasticity; brown; saturated; loose. (Alluvium)						
1101.6	46.5	SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown; saturated; dense. (Alluvium)						47.5
				7				
				17				
				19				
				(36)				50.0
								52.5
1094.6	53.5	SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense. (Alluvium)		7				
				7				
				7				
				(14)				55.0
								57.5
1089.6	58.5	SC-SM - SILTY, CLAYEY SAND; 70-80% fine sand; low to medium plasticity; brown mottled with yellowish red; saturated; medium dense. (Alluvium)		11				
1088.6	59.5			10				
1088.1	60.0	SC - CLAYEY SAND; 55-65% fine sand; medium plasticity; brown; saturated;		10 (20)				60.0

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SHEET 4 of 5

DATE: 10-8-2010

WATER LEVELS ▽ Cave-in @ 13.0' ▼ 7.5 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			medium dense. (Alluvium)						60.0
			SC - CLAYEY SAND; 55-65% fine sand; medium plasticity; brown; saturated; medium dense. (Alluvium)						62.5
1084.6	63.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; yellowish brown; saturated; dense; with silty sand seams. (Alluvium)		6 12 18 (30)				65.0
									67.5
1079.6	68.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; yellowish brown; saturated; medium dense; with clayey sand seams. (Alluvium)		5 5 8 (13)				70.0
									72.5
1074.6	73.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light yellowish brown with yellowish red; saturated; dense. (Alluvium)		8 12 12 (24)				75.0
1072.1	76.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						77.5
					100/5.5" (R)				
1068.1	80.0								80.0

BORING LOG ARENALOGS.GPJ HWS.GDT 12/13/10

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SHEET 5 of 5

DATE: 10-8-2010

WATER LEVELS ▽ Cave-in @ 13.0' ▼ 7.5 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						80.0
									82.5
					100/4" (R)				
									85.0
									87.5
1059.6	88.5				100/3.5" (R)				
1059.3	88.8		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						
			Boring Terminated at: 88.8ft						90.0
									92.5
									95.0
									97.5
									100.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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PROJECT: Lincoln Haymarket Arena
Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75HT / Hollow-Stem
CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-32

SHEET 1 of 5

DATE: 10-7-2010

WATER LEVELS ▽ Cave-in @ 14.3' ▼ 3.6 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1148.4	0.0		CL - LEAN CLAY; 0-5% fine to coarse gravel; 5-15% fine to coarse sand; medium plasticity; very dark grayish brown with very dark gray; wet; medium stiff to stiff. (Fill)						0.0
1147.4	1.0		BALLAST ROCK 8" thick; fine to coarse; loose. (Fill)						
1146.7	1.7		CL - LEAN CLAY with Sand; 20-30% fine to coarse sand; medium plasticity; very dark gray; wet; soft; with slight odor. (Fill)						
1145.9	2.5		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark grayish brown mottled with black and dark brown; wet to saturated; medium stiff; with strong odor. (Alluvium)			0.75*			2.5
1144.8	3.6			55		0.7*	85.4	31.8	
			CL - LEAN CLAY; 0-5% fine sand; medium plasticity; dark grayish brown mottled with black and dark brown; saturated; medium stiff; with strong odor. (Alluvium)			0.75*			
1143.9	4.5		CL - LEAN CLAY; medium plasticity; dark gray; saturated; medium stiff; with silt seams. (Alluvium)		2	0.8*			
1143.2	5.2		CL - LEAN CLAY; medium plasticity; very dark gray slightly mottled with black; saturated; medium stiff to stiff. (Alluvium)		2				5.0
1142.4	6.0		CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff to stiff. (Alluvium)		3				
					3				
					(5)				
1140.4	8.0		CL - LEAN CLAY with Sand; 20-30% fine to coarse sand; medium plasticity; dark gray with very dark gray; saturated; medium stiff to stiff. (Alluvium)						7.5
1139.6	8.8		CL - LEAN CLAY; medium plasticity; greenish gray; saturated; medium stiff. (Alluvium)		1				
					3				
					3				
					2				10.0
					(6)				
1137.4	11.0		CL - LEAN CLAY; medium plasticity; greenish gray; saturated; medium stiff to stiff. (Alluvium)		1				
					2				
					2				
					2				12.5
1135.4	13.0		CL/ML - SILTY CLAY; low to medium plasticity; greenish gray; saturated; soft. (Alluvium)		(4)				
					1				
					1				
					1				
1133.4	15.0		ML - SILT; low plasticity; greenish gray; saturated; loose. (Alluvium)		1				15.0
					(2)				
									17.5
1129.4	19.0		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; gray with very dark gray; saturated; medium dense. (Alluvium)		1				
					3				
					6				
1128.4	20.0				(9)				20.0

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CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-32

SHEET 2 of 5

DATE: 10-7-2010

WATER LEVELS ▽ Cave-in @ 14.3' ▼ 3.6 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; gray with very dark gray; saturated; medium dense. (Alluvium)						20.0
1127.4	21.0		CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff; with wood fragments; with moderate odor. (Alluvium)		2 2 2 (4)				22.5
1125.4	23.0		CL/ML - SILTY CLAY; low to medium plasticity; dark gray; saturated; soft; with silt seams. (Alluvium)		0 1 2 (3)				
1124.3	24.1		SM - SILTY SAND; 75-85% fine sand; low plasticity; dark gray; saturated; loose. (Alluvium)						
1123.6	24.8		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; dark gray; saturated; very loose. (Alluvium)						25.0
									27.5
1119.9	28.5		SP - POORLY GRADED SAND; 95-100% fine to coarse sand; nonplastic; gray; saturated; medium dense; with moderate odor. (Alluvium)		2 6 7 (13)				30.0
									32.5
1114.9	33.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; gray with dark gray; saturated; medium dense. (Alluvium)		3 5 9 (14)				35.0
1111.4	37.0		CL - LEAN CLAY; medium plasticity; light grayish brown mottled with yellowish red; saturated; medium stiff. (Alluvium)						37.5
1109.0	39.4		CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff to stiff. (Alluvium)		2 2 3 (5)				
1108.4	40.0								40.0

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BORING LOG

BORING No.: B-32

SHEET 3 of 5

DATE: 10-7-2010

WATER LEVELS ▽ Cave-in @ 14.3' ▼ 3.6 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CH - FAT CLAY; high plasticity; very dark gray; saturated; medium stiff to stiff. (Alluvium)						40.0
1106.4	42.0		SM - SILTY SAND; 60-70% fine sand; nonplastic; brown with grayish brown; saturated; medium dense. (Alluvium)						42.5
1104.1	44.3		CL - LEAN CLAY; medium plasticity; brown slightly mottled with yellowish red; saturated; stiff; with silty sand seams. (Alluvium)		3 5 3 (8)				45.0
									47.5
1099.9	48.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown mottled with yellowish red; saturated; dense. (Alluvium)		3 12 17 (29)				50.0
									52.5
1094.9	53.5		SP - POORLY GRADED SAND; 10-15% fine gravel; 80-85% fine to coarse sand; nonplastic; light yellowish brown with light grayish brown; saturated; dense. (Alluvium)		16 19 15 (34)				55.0
1092.4	56.0		CL - SANDY LEAN CLAY; 35-45% fine sand; medium plasticity; grayish brown mottled with yellowish red; saturated; very stiff. (Alluvium)						57.5
1089.4	59.0		SC - CLAYEY SAND; 60-70% fine sand; medium plasticity; dark grayish brown; saturated; medium dense. (Alluvium)						
1088.4	60.0								60.0

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BORING LOG

BORING No.: B-32

SHEET 4 of 5

DATE: 10-7-2010

WATER LEVELS ▽ Cave-in @ 14.3' ▼ 3.6 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SC - CLAYEY SAND; 60-70% fine sand; medium plasticity; dark grayish brown; saturated; medium dense. (Alluvium)		5 6 15 (21)				60.0 62.5
1084.9	63.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; light yellowish brown; saturated; loose. (Alluvium)		3 2 3 (5)				65.0 67.5
1079.9	68.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light yellowish brown; saturated; medium dense; with a trace of coarse sand. (Alluvium)		5 7 10 (17)				70.0 72.5
1075.4	73.0								
1074.9	73.5		SP - POORLY GRADED SAND; 0-5% fine to coarse gravel; 90-95% fine to medium sand; nonplastic; light yellowish brown; saturated; medium dense. (Alluvium)		10 13 45 (58)				
1074.1	74.3		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; brownish yellow with dark yellowish red; saturated; medium dense. (Weathered Dakota Sandstone)						75.0
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)		100/5.5" (R)				77.5
1068.4	80.0								80.0

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BORING LOG

BORING No.: B-32

SHEET 5 of 5

DATE: 10-7-2010

WATER LEVELS ▽ Cave-in @ 14.3' ▼ 3.6 on 10-9-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						80.0
									82.5
1064.9	83.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)		100/4" (R)				
									85.0
									87.5
1059.9	88.5				100/3" (R)				
1059.6	88.8		SM - SILTY SAND; 75-85% fine sand; nonplastic; pale yellow; saturated; very dense. (Dakota Sandstone)						
			Boring Terminated at: 88.8ft						
									90.0
									92.5
									95.0
									97.5
									100.0

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BORING LOG

BORING No.: B-33

SHEET 1 of 5

DATE: 9-27-2010

WATER LEVELS ▽ Cave-in @ 23.8' ▼ 11.1 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1150.1	0.0		SM - SILTY SAND; 0-5% fine to coarse gravel; 70-80% fine to coarse sand; 20-30% fines, low plasticity; black; moist; loose; with 50% cinders. (Fill)		3 2 3 (5)				0.0
1148.6	1.5		CL - LEAN CLAY; medium plasticity; yellowish brown with black; wet; medium stiff. (Fill)						2.5
1146.6	3.5		CL - LEAN CLAY; 5-15% fine sand; medium plasticity; black with greenish gray; wet; medium stiff. (Fill)		1 1 1 (2)				
1145.1	5.0		CL - LEAN CLAY; 5-10% fine sand; medium plasticity; olive brown with dark yellowish brown; wet; stiff to very stiff; with moderate diesel fuel odor. (Fill)			2.0*	87.7	32.1	5.0
1144.4	5.7		CL - LEAN CLAY; medium plasticity; greenish gray; wet; medium stiff; with strong diesel fuel odor. (Fill)	56		0.75*			7.5
1141.6	8.5		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; black; wet; medium stiff; with few thin silt seams. (Alluvium)		1 1 2 (3)				10.0
1139.6	10.5		CL - LEAN CLAY; medium plasticity; dark gray with greenish gray and black; wet to saturated; stiff. (Alluvium)		1 3 3 (6)				
1139.0	11.1 ▼		CL - LEAN CLAY; medium plasticity; dark gray with greenish gray and black; saturated; stiff. (Alluvium)						12.5
1136.6	13.5		CL - LEAN CLAY; medium plasticity; olive gray; saturated; medium stiff. (Alluvium)		1 2 2 (4)				15.0
1134.1	16.0		CL - LEAN CLAY; 10-15% fine to medium sand; medium plasticity; very dark gray; saturated; medium stiff. (Alluvium)	57		1.0* 1.0*	91.8	29.6	17.5
1132.1	18.0		CL - LEAN CLAY; medium plasticity; dark gray with olive; saturated; stiff. (Alluvium)		2 2 4 (6)	0.8*			
1130.1	20.0								20.0

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RIG / METHOD: CME 75HT / Hollow-Stem
CREW: CL, BB & JL

BORING LOG

BORING No.: B-33

SHEET 2 of 5

DATE: 9-27-2010

WATER LEVELS ▽ Cave-in @ 23.8' ▼ 11.1 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			CL - LEAN CLAY; medium plasticity; dark gray with olive; saturated; stiff. (Alluvium)						20.0
									22.5
1126.1	24.0				2				
1125.6	24.5		CH - FAT CLAY; high plasticity; dark gray; saturated; stiff; with sand seams. (Alluvium)		3				
			SM - SILTY SAND; 60-70% fine sand; 30-40% fines, low plasticity; dark gray; saturated; loose; with few fat clay seams. (Alluvium)		3 (6)				25.0
1122.6	27.5		SP - POORLY GRADED SAND; fine to coarse sand; dark gray; saturated; loose. (Alluvium)						27.5
					2				
					2				
					5				
					(7)				30.0
									32.5
1116.6	33.5		SP - POORLY GRADED SAND; fine sand; gray; saturated; medium dense. (Alluvium)		6				
					9				
					14				
					(23)				35.0
									37.5
1111.6	38.5		SP - POORLY GRADED SAND; 0-5% fine gravel; fine to coarse sand; pale brown; saturated; medium dense. (Alluvium)		3				
					6				
					9				
1110.1	40.0				(15)				40.0

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BORING LOG

BORING No.: B-33

SHEET 3 of 5

DATE: 9-27-2010

WATER LEVELS ▽ Cave-in @ 23.8' ▼ 11.1 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; fine to coarse sand; pale brown; saturated; medium dense. (Alluvium)						40.0
1108.6	41.5		SP - POORLY GRADED SAND; fine sand; light yellowish brown; saturated; medium dense. (Alluvium)						42.5
1106.6	43.5		CH - FAT CLAY; 5-15% fine sand; high plasticity; dark brown mottled with yellowish red; saturated; medium stiff. (Alluvium)		2				
1106.1	44.0		ML - SANDY SILT; 40-50% fine sand; low plasticity; dark brown; saturated; loose. (Alluvium)		3				
1105.6	44.5		CL - LEAN CLAY with Sand; 15-25% fine sand; medium plasticity; dark brown; saturated; stiff. (Alluvium)		4 (7)				45.0
									47.5
					5 8 12 (20)				50.0
									52.5
1096.6	53.5		SP - POORLY GRADED SAND; 0-5% fine gravel; fine to coarse sand; light yellowish brown; saturated; very dense. (Alluvium)		15 25 33 (58)				55.0
									57.5
1091.6	58.5		SP - POORLY GRADED SAND; fine to coarse sand; light yellowish brown; saturated; medium dense. (Alluvium)		9 16 15 (31)				
1090.1	60.0								60.0

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BORING LOG

BORING No.: B-33

SHEET 4 of 5

DATE: 9-27-2010

WATER LEVELS ▽ Cave-in @ 23.8' ▼ 11.1 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; fine to coarse sand; light yellowish brown; saturated; medium dense. (Alluvium)						60.0
									62.5
1086.6	63.5		SP - POORLY GRADED SAND; fine sand; light yellowish brown; saturated; medium dense. (Alluvium)		8 10 13 (23)				65.0
									67.5
1081.6	68.5		SP - POORLY GRADED SAND; fine to coarse sand; light yellowish brown; saturated; medium dense. (Alluvium)		7 9 11 (20)				70.0
									72.5
1076.6	73.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; fine to coarse sand; yellowish red; saturated; loose. (Alluvium)		2 3 5 (8)				75.0
1074.1	76.0		SP-SM - POORLY GRADED SAND with Silt; fine sand; light yellowish brown; saturated; very dense. (Dakota Sandstone)						77.5
					100/5" (R)				
1070.1	80.0								80.0

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SHEET 5 of 5

DATE: 9-27-2010

WATER LEVELS ▽ Cave-in @ 23.8' ▼ 11.1 on 9-28-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; light yellowish brown; saturated; very dense. (Dakota Sandstone)						80.0
									82.5
					100/5" (R)				
									85.0
									87.5
1061.6	88.5				100/5" (R)				
1061.2	88.9		SP - POORLY GRADED SAND; fine sand; light yellowish brown; saturated; very dense. (Dakota Sandstone)						
			Boring Terminated at: 88.9ft						90.0
									92.5
									95.0
									97.5
									100.0

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CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-34

SHEET 1 of 4

DATE: 10-14-2010

WATER LEVELS ▽ Cave-in @ 14.5' ▼ 12.4 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
1052.2	0.0		CH - FAT CLAY; 0-5% fine to coarse sand; high plasticity; dark grayish brown with very dark gray; wet; medium stiff to stiff. (Fill)						0.0
					2 3 7 6 (10)				
1050.2	2.0		GW - WELL-GRADED GRAVEL; 30-40% fine to coarse gravel; 60-70% fine to coarse sand; 0-5% fines, nonplastic; moist; medium dense. (Fill)						2.5
1049.0	3.2		CL - LEAN CLAY; 10-15% fine to coarse sand; medium plasticity; dark greenish gray with black; wet; medium stiff; with strong odor. (Fill)		1 2 3 3 (5)				
1047.2	5.0		CL - LEAN CLAY; medium plasticity; dark greenish gray; wet; medium stiff to stiff. (Alluvium)						5.0
1046.2	6.0		CL - LEAN CLAY; 0-5% fine sand; medium plasticity; olive brown with yellowish brown; wet; medium stiff to stiff. (Alluvium)			0.75*			
1045.5	6.7		CL - LEAN CLAY; 10-15% fine to medium sand; medium plasticity; dark grayish brown with greenish gray; wet; medium stiff to stiff; with moderate fuel odor. (Alluvium)	58		1.25* 0.75*	95.0	24.6	7.5
1044.2	8.0					1.2*			
1043.7	8.5		CL - LEAN CLAY with Sand; 20-30% fine to medium sand; medium plasticity; very dark gray; wet; medium stiff. (Alluvium)						
			CL - SANDY LEAN CLAY; 30-40% fine to medium sand; medium plasticity; gray; wet; medium stiff to stiff. (Alluvium)		1 2 3 3 (5)				10.0
1041.2	11.0								
1040.7	11.5		SC-SM - SILTY, CLAYEY SAND; 70-80% fine sand; low to medium plasticity; greenish gray; wet; loose. (Alluvium)		1 2 2 1 (4)				
			SM - SILTY SAND; 70-80% fine sand; low plasticity; greenish gray; saturated; loose. (Alluvium)						
1039.7	12.5		CL - SANDY LEAN CLAY; 35-45% fine sand; medium plasticity; greenish gray; saturated; soft. (Alluvium)						12.5
1038.7	13.5								
1038.2	14.0		SC - CLAYEY SAND; 60-70% fine sand; medium plasticity; greenish gray; saturated; loose. (Alluvium)		1 3 5 5 (8)				
1037.7	14.5		SM - SILTY SAND; 70-80% fine sand; low plasticity; greenish gray; saturated; loose. (Alluvium)						
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light greenish gray; saturated; medium dense. (Alluvium)						15.0
									17.5
1033.7	18.5		SP - POORLY GRADED SAND; 95-100% fine sand; nonplastic; greenish gray; saturated; medium dense. (Alluvium)		4 7 14 (21)				
1033.0	19.2		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; gray with greenish gray; saturated; dense. (Alluvium)						
1032.2	20.0								20.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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PROJECT: Lincoln Haymarket Arena
Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75 / Hollow-Stem
CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-34

SHEET 2 of 4

DATE: 10-14-2010

WATER LEVELS ▽ Cave-in @ 14.5' ▼ 12.4 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; gray with greenish gray; saturated; dense. (Alluvium)						20.0
									22.5
1028.7	23.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; light brownish gray with very pale brown; saturated; dense. (Alluvium)		5 13 16 (29)				25.0
1024.7	27.5		CH - FAT CLAY; high plasticity; dark grayish brown with brown slightly mottled with yellowish red and very dark gray; saturated; stiff. (Alluvium)						27.5
1023.2	29.0		ML - SILT; 0-5% fine sand; low plasticity; light grayish brown; saturated; medium dense; with clay seams. (Alluvium)		4 4 5 (9)				30.0
									32.5
1018.7	33.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; light greenish gray; saturated; dense; with moderate odor. (Alluvium)		6 12 12 (24)				35.0
									37.5
1013.7	38.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; gray with light gray; no odor; saturated; dense. (Alluvium)		7 13 16 (29)				40.0
1012.2	40.0								

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75 / Hollow-Stem
CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-34

SHEET 3 of 4

DATE: 10-14-2010

WATER LEVELS ▽ Cave-in @ 14.5' ▼ 12.4 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; gray with light gray; no odor; saturated; dense. (Alluvium)						40.0
									42.5
1008.7	43.5		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown with yellowish brown; saturated; medium dense. (Alluvium)		3 4 7 (11)				45.0
									47.5
1003.7	48.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; very pale brown; saturated; dense. (Alluvium)		7 9 14 (23)				50.0
									52.5
998.7	53.5		SP - POORLY GRADED SAND; 95-100% fine to medium sand; nonplastic; very pale brown; saturated; very dense. (Alluvium)		11 22 23 (45)				55.0
									57.5
993.7	58.5		SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; brown with dark grayish brown and very pale brown; saturated; very dense; with silty sand seams. (Alluvium)		11 24 50 (74)				
992.2	60.0								60.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

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Haymarket Depot Yard

LOCATION: Lincoln, Nebraska

JOB NO.: 00110099.00
RIG / METHOD: CME 75 / Hollow-Stem
CREW: BB, LDI & GBW

BORING LOG

BORING No.: B-34

SHEET 4 of 4

DATE: 10-14-2010

WATER LEVELS ▽ Cave-in @ 14.5' ▼ 12.4 on 10-14-2010

ELEV (USGS)	DEPTH (feet)	LOG	LITHOLOGY DESCRIPTION	SAMPLE	SPT	qu (tsf)	DRY DENSITY (pcf)	MOISTURE (%)	DEPTH (feet)
			SP - POORLY GRADED SAND; 5-10% fine to coarse gravel; 85-90% fine to coarse sand; nonplastic; brown with dark grayish brown and very pale brown; saturated; very dense; with silty sand seams. (Alluvium)						60.0
989.7	62.5		CL - SANDY LEAN CLAY; 40-50% fine to medium sand; medium plasticity; grayish brown slightly mottled with yellowish red; saturated; very stiff. (Alluvium)						62.5
					3 6 7 (13)				65.0
985.2	67.0		SP - POORLY GRADED SAND; 0-5% fine gravel; 90-95% fine to coarse sand; nonplastic; very pale brown; saturated; medium dense. (Alluvium)						67.5
					4 9 12 (21)				70.0
980.2	72.0		GP - POORLY GRADED GRAVEL. (Alluvium)						72.5
978.7	73.5		SM - SILTY SAND; 65-75% fine sand; nonplastic; very pale brown with light brownish gray slightly mottled with yellowish red; saturated; very dense; with silt and clay seams. (Alluvium)		12 25 37 (62)				
977.7	74.5		SP-SM - POORLY GRADED SAND with Silt; 85-95% fine sand; nonplastic; very pale brown; saturated; very dense. (Dakota Sandstone)						75.0
									77.5
974.2	78.0		SM - SILTY SAND; 75-85% fine sand; nonplastic; very pale brown; saturated; very dense. (Dakota Sandstone)		100/3" (R)				
973.4	78.8		Boring Terminated at: 78.8ft						80.0

* Unconfined compressive strength was estimated using a calibrated hand penetrometer.

APPENDIX D. CRITERIA USED FOR SOIL CLASSIFICATION

USCS SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIALS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)		GW	WELL-GRADED GRAVEL
				GP	POORLY-GRADED GRAVEL
		GRAVELS WITH FINES (MORE THAN 12% FINES)		GM	SILTY GRAVEL (LOW PLASTIC FINES)
				GC	CLAYEY GRAVEL (MEDIUM TO HIGH PLASTIC FINES)
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)		SW	WELL-GRADED SAND
				SP	POORLY-GRADED SAND
		SANDS WITH FINES (MORE THAN 12% FINES)		SM	SILTY SAND (LOW PLASTIC FINES)
				SC	CLAYEY SAND (MEDIUM TO HIGH PLASTIC FINES)
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	SILT (0-15% SAND) SILT WITH SAND (15-30% SAND) SANDY SILT (30-50% SAND)
				CL	LEAN CLAY (0-15% SAND) LEAN CLAY WITH SAND (15-30% SAND) SANDY LEAN CLAY (30-50% SAND)
				OL	ORGANIC SILTS AND LEAN CLAYS
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	ELASTIC SILT (0-15% SAND) ELASTIC SILT WITH SAND (15-30% SAND) SANDY ELASTIC SILT (30-50% SAND)
				CH	FAT CLAY (0-15% SAND) FAT CLAY WITH SAND (15-30% SAND) SANDY FAT CLAY (30-50% SAND)
				OH	ORGANIC ELASTIC SILTS AND FAT CLAYS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

GENERAL NOTES

CRITERIA FOR DESCRIBING CLAY SOILS

MOISTURE CONDITION

Description	Criteria
Dry	Absence of moisture, dusty, dry to touch.
Moist	Damp, slightly wet, moisture content below plastic limit.
Wet	Moisture content above the plastic limit.
Saturated	Very wet. Usually soils is below the water table.

CONSISTENCY

Description	Penetration Resistance, N_{60} (blows/ft)[1]
Very Soft	Less than 3
Soft	3 to 4
Medium Stiff	5 to 8
Stiff	9 to 16
Very Stiff	16 to 32
Hard	Greater than 32

CRITERIA FOR DESCRIBING GRANULAR SOILS

MOISTURE CONDITION

Description	Criteria
Dry	Absence of moisture, dry to the touch.
Moist	Damp but no visible free water.
Wet	Visible free water.
Saturated	Usually soil is below water table.

DENSITY

Description	Penetration Resistance, N_{60} (blows/ft)[1]
Very Loose	Less than 5
Loose	5 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	Greater than 50

CRITERIA FOR DESCRIBING ROCK

STRENGTH/HARDNESS

Description	Criteria
Very Soft	Permits denting by moderate pressure of the fingers.
Soft	Resists denting by the fingers, but can be abraded and pierced to a shallow depth by a pencil point.
Moderately Soft	Resists a pencil point, but can be scratched and cut with a knife blade.
Moderately Hard	Resistant to abrasion or cutting by a knife blade, but can be easily dented or broken by light blows of a hammer.
Hard	Can be deformed or broken by repeated moderate hammer blows.
Very Hard	Can be broken only by heavy, and in some rocks, repeated hammer blows.

[1]Blow counts shown on the boring logs are those recorded directly in the field and have not been corrected for hammer efficiency. The boring log blow counts must be corrected to an equivalent hammer efficiency of 60% in order to use the criteria in this table.

APPENDIX E. CONSOLIDATION TEST REPORTS

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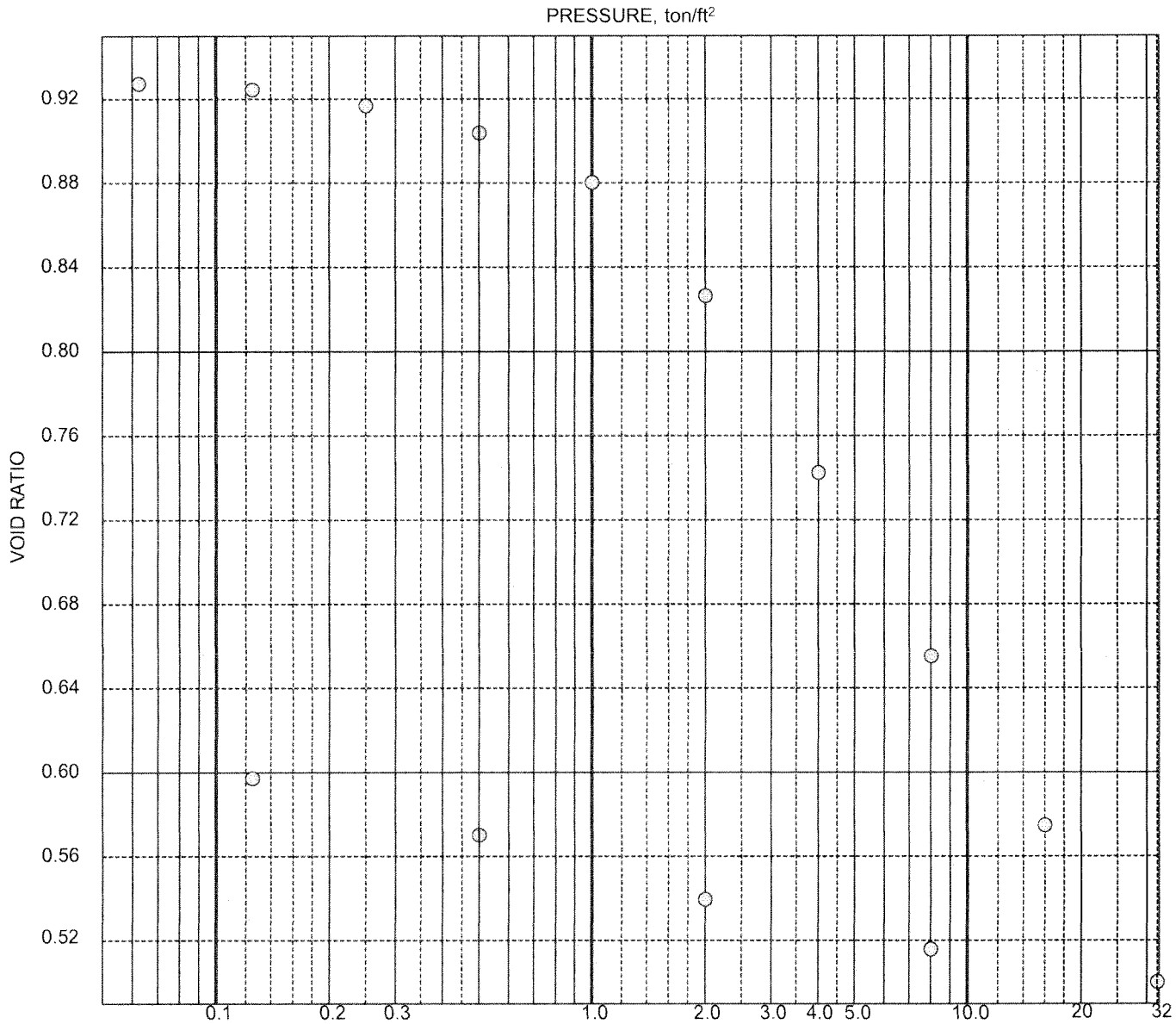
CONSOLIDATION TEST REPORT

ASTM Designation: D2435



Initial Ht.	**1.00** in.	Diameter	**2.50**	in.	Type of Specimen	**Undisturbed**	
Initial Saturation			**95.8**	%	Overburden Pressure	**0.73**	ton/ft²
Final Saturation			**100.0**	%	Preconsolidation Pressure	**1.40**	ton/ft²
Initial Dry Density			**87.4**	lb/ft³	Compression Index	**0.32**	
Initial Water Content			**32.9**	%	Recompression Index	**0.03**	

Test data was obtained and computed using the methods and procedures specified in the latest ASTM method

Remarks:	**Saturated Test**	Project	**West Haymarket Arena**		
			Lincoln, NE		
Classification:	**CL - Alluvium**				
LL	G	Boring No.	**B-3**	Sample No.	**6**
PL	D_{10}	Depth	**18.1'-18.8'** ft	Date	**11-7-2010**

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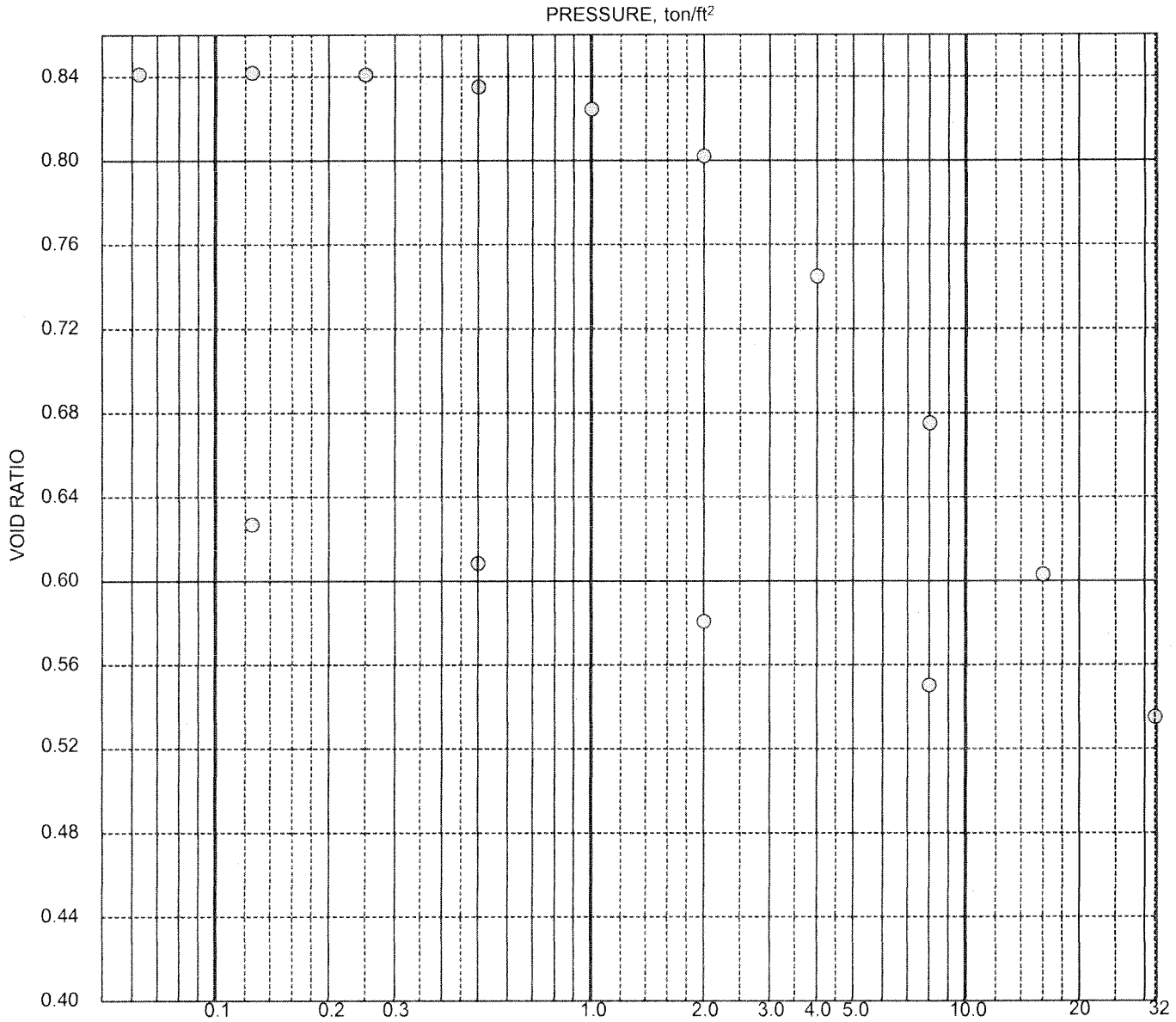

Initial Ht.	**1.00** in.	Diameter	**2.50**	in.	Type of Specimen	**Undisturbed**	
Initial Saturation			**89.2**	%	Overburden Pressure	**0.45**	ton/ft²
Final Saturation			**100.0**	%	Preconsolidation Pressure	**2.40**	ton/ft²
Initial Dry Density			**91.5**	lb/ft³	Compression Index	**0.25**	
Initial Water Content			**27.8**	%	Recompression Index	**0.03**	

Test data was obtained and computed using the methods and procedures specified in the latest ASTM method

Remarks:	**Saturated Test**	Project	**West Haymarket Arena**		
			Lincoln, NE		
Classification:	**CL - Alluvium**				
LL	G	Boring No.	**B-7**	Sample No.	**10**
PL	D_{10}	Depth	**8.0'-8.4'** ft	Date	**11-10-2010**

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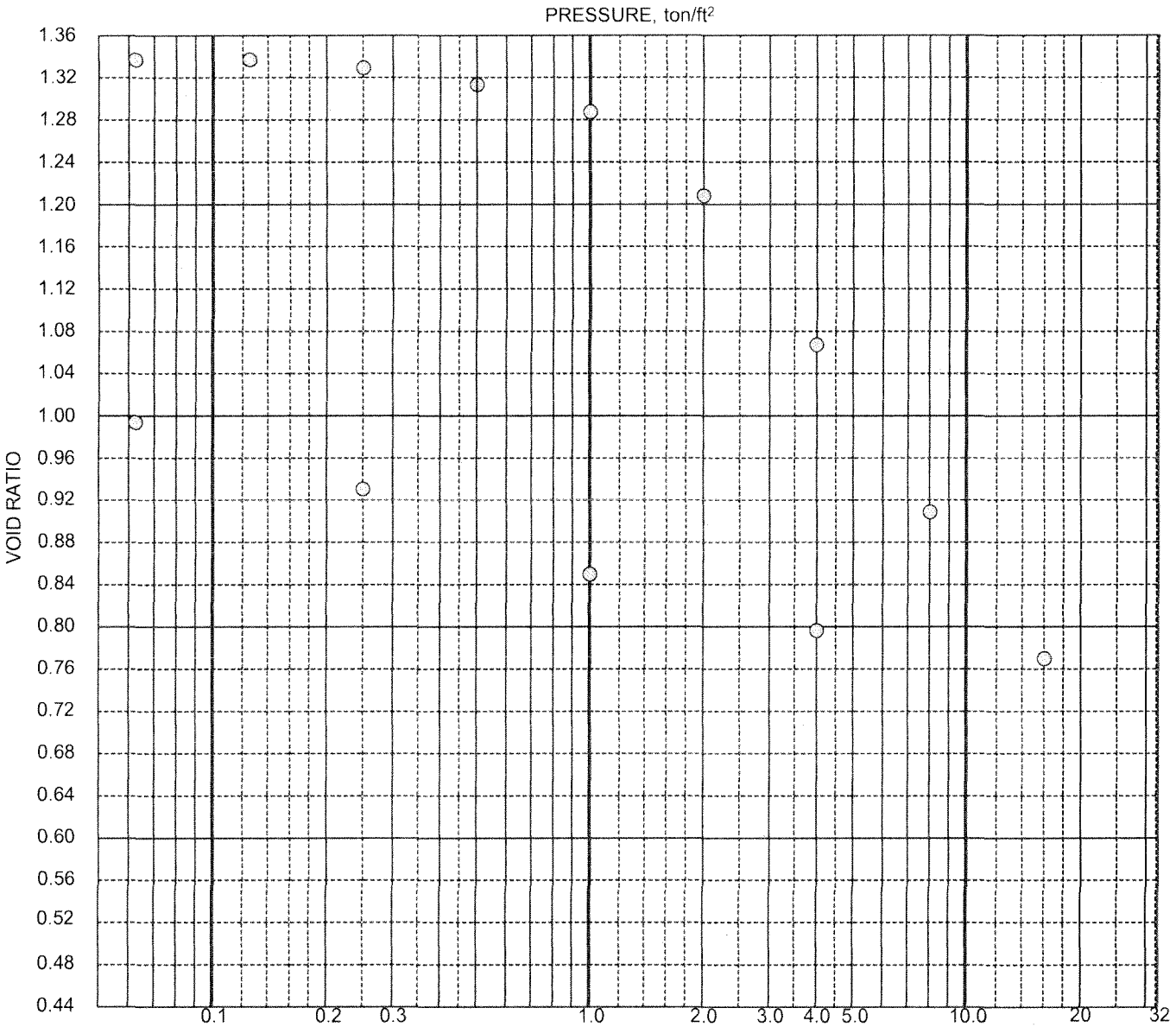

Initial Ht.	**1.00** in.	Diameter	**2.50** in.	Type of Specimen	**Undisturbed**		
Initial Saturation			**94.5** %	Overburden Pressure		**0.89**	ton/ft^2
Final Saturation			**100.0** %	Preconsolidation Pressure		**1.90**	ton/ft^2
Initial Dry Density			**72.1** lb/ft^3	Compression Index		**0.59**	
Initial Water Content			**46.8** %	Recompression Index		**0.04**	

Test data was obtained and computed using the methods and procedures specified in the latest ASTM method

Remarks:	**Saturated Test**	Project	**West Haymarket Arena**		
			Lincoln, NE		
Classification:	**CH - Alluvium**				
LL	G	Boring No.	**B-12**	Sample No.	**20**
PL	D_{10}	Depth	**21.5'-22.1'** ft	Date	**11-10-2010**

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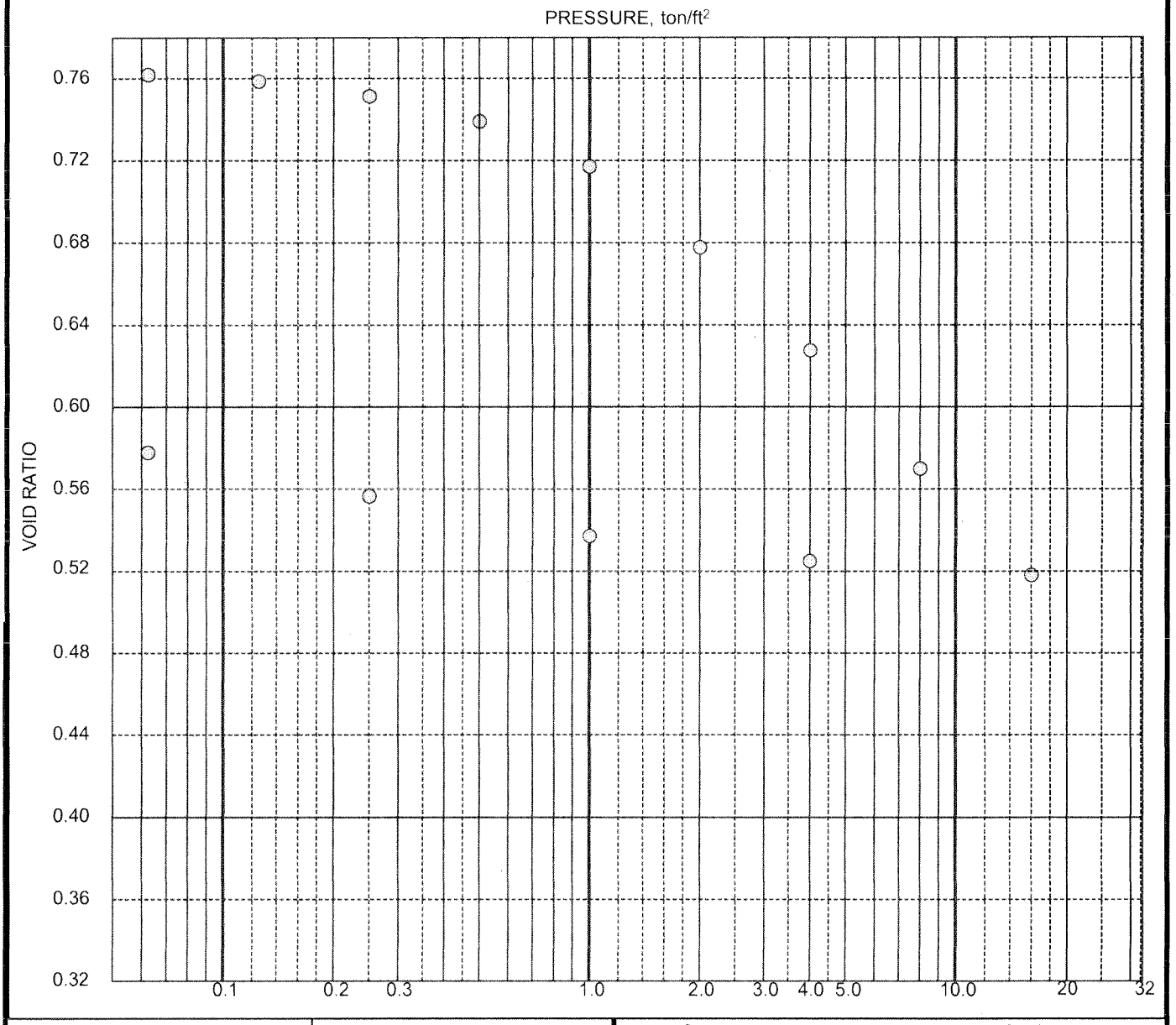

Initial Ht.	1.00 in.	Diameter	2.50 in.	Type of Specimen	Undisturbed		
Initial Saturation			87.6 %	Overburden Pressure		0.51	ton/ft²
Final Saturation			100.0 %	Preconsolidation Pressure		1.50	ton/ft²
Initial Dry Density			95.6 lb/ft³	Compression Index		0.22	
Initial Water Content			24.7 %	Recompression Index		0.01	

Test data was obtained and computed using the methods and procedures specified in the latest ASTM method

Remarks:	Saturated Test	Project	West Haymarket Arena		
			Lincoln, NE		
Classification:	CL - Alluvium				
LL	G	Boring No.	B-19	Sample No.	32
PL	D_{10}	Depth	12.3'-13.1' ft	Date	11-9-2010

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CONSOLIDATION TEST REPORT

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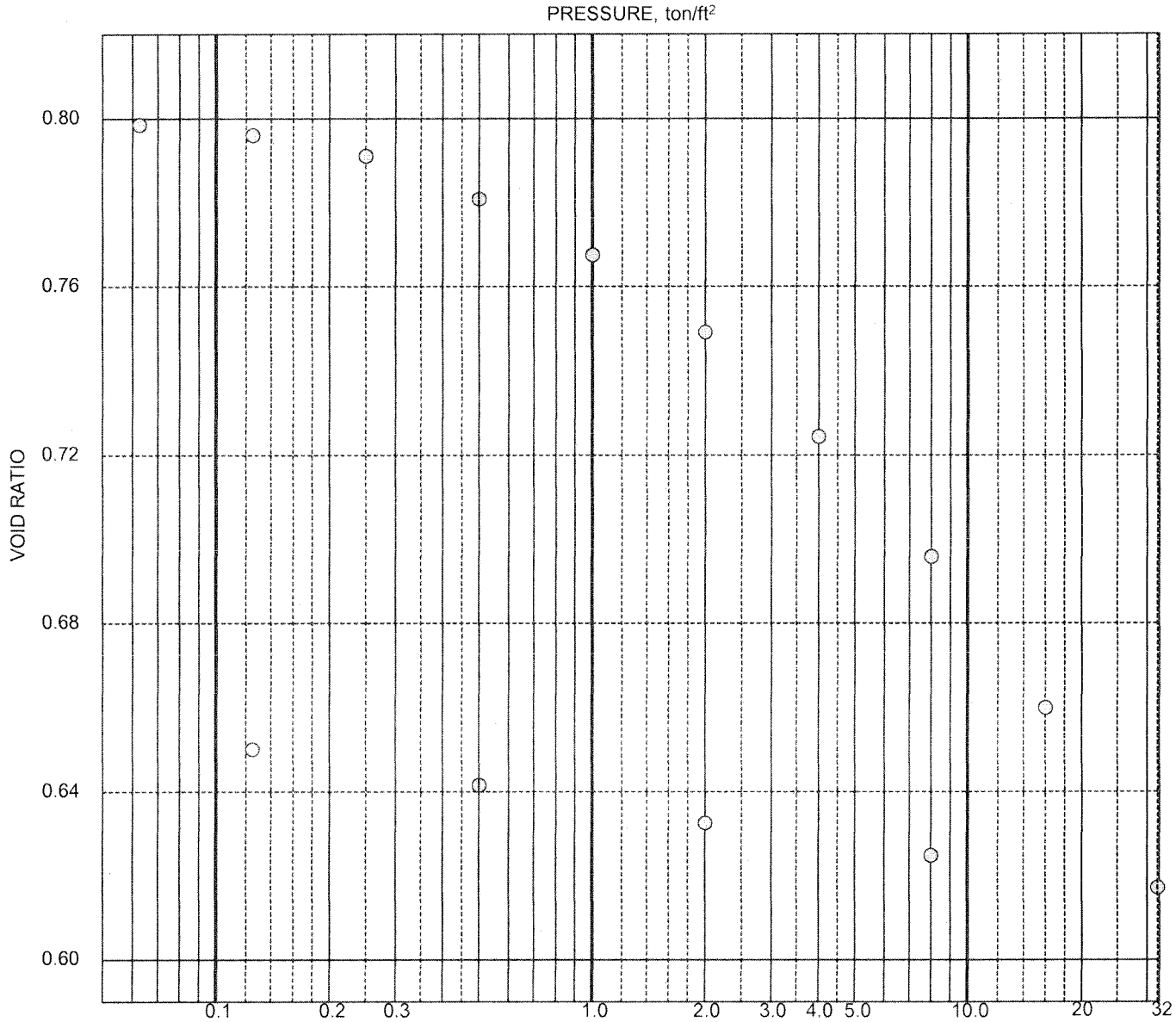

Initial Ht.	**1.00** in.	Diameter	**2.50** in.	Type of Specimen	**Undisturbed**		
Initial Saturation			**90.4** %	Overburden Pressure		**0.27**	ton/ft²
Final Saturation			**100.0** %	Preconsolidation Pressure		**3.50**	ton/ft²
Initial Dry Density			**93.6** lb/ft³	Compression Index		**0.16**	
Initial Water Content			**26.8** %	Recompression Index		**0.01**	

Test data was obtained and computed using the methods and procedures specified in the latest ASTM method

Remarks:	**Saturated Test**	Project	**West Haymarket Arena**		
			Lincoln, NE		
Classification:	**CL - Alluvium**				
LL	G	Boring No.	**B-23**	Sample No.	**40**
PL	D_{10}	Depth	**4.4'-5.0'** ft	Date	**11-4-2010**

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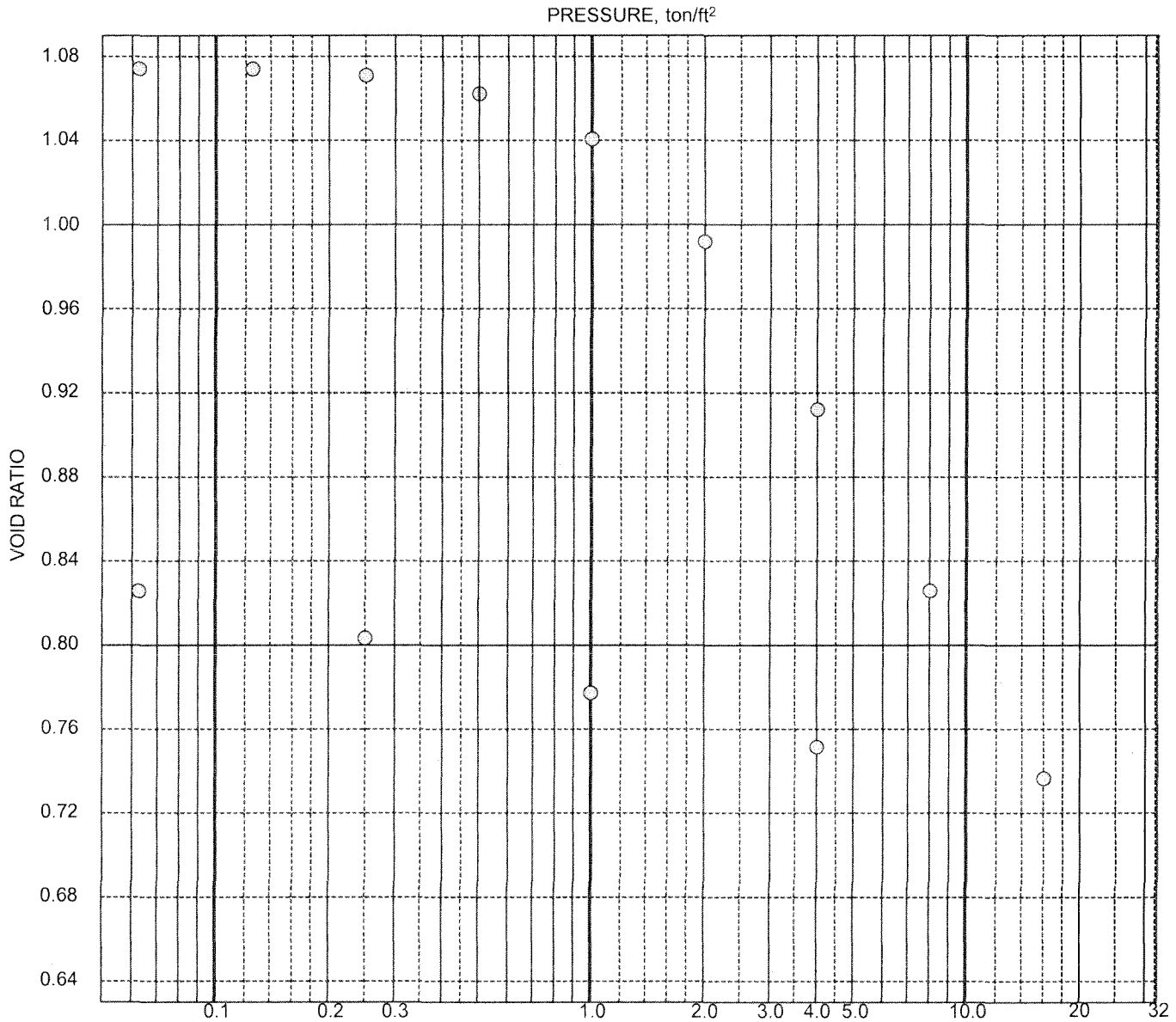

Initial Ht.	**1.00** in.	Diameter	**2.50** in.	Type of Specimen	**Undisturbed**		
Initial Saturation			**97.8** %	Overburden Pressure		**0.42**	ton/ft^2
Final Saturation			**94.1** %	Preconsolidation Pressure		**1.80**	ton/ft^2
Initial Dry Density			**81.2** lb/ft^3	Compression Index		**0.32**	
Initial Water Content			**38.9** %	Recompression Index		**0.03**	

Test data was obtained and computed using the methods and procedures specified in the latest ASTM method

Remarks:	**Saturated Test**	Project	**West Haymarket Arena**		
			Lincoln, NE		
Classification:	**CL - Alluvium**				
LL	G	Boring No.	**B-27**	Sample No.	**46**
PL	D_{10}	Depth	**10.0'-10.6'** ft	Date	**11-9-2010**

APPENDIX F. UNCONFINED COMPRESSION TEST REPORTS

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UNCONFINED COMPRESSION TEST

ASTM Designation: D2166

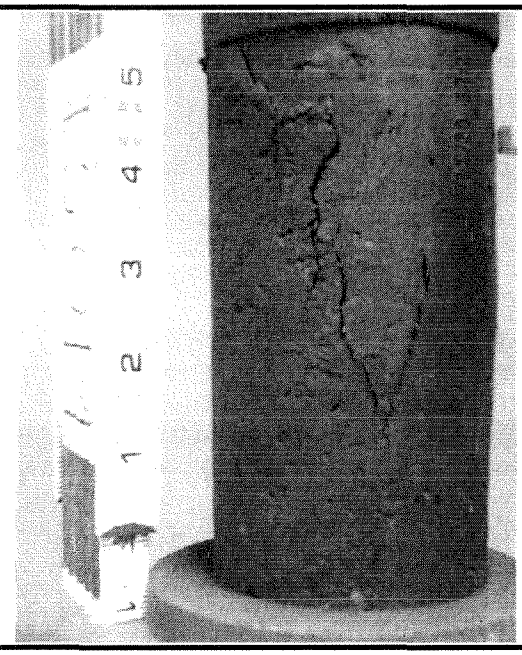
Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-1	Depth: 8.6'-9.3'	Lab No.: 28869
Type of Specimen:	3" Tube	Humidity During Trimming:	50%
Remarks:		Classification:	CL (Alluvium)

SAMPLE INFORMATION

Wet Unit Wt (lb/ft^3)	115.0
Dry Unit Wt (lb/ft^3)	90.4
Water Content (%)	27.2
Saturation (%)	85.6
Length/Diameter	2.03
Average Strain Rate (%/min)	0.058
Strain at failure	1.9%

Unconfined Compressive Strength

lbs/in^2	15.6
tons/ft^2	1.1



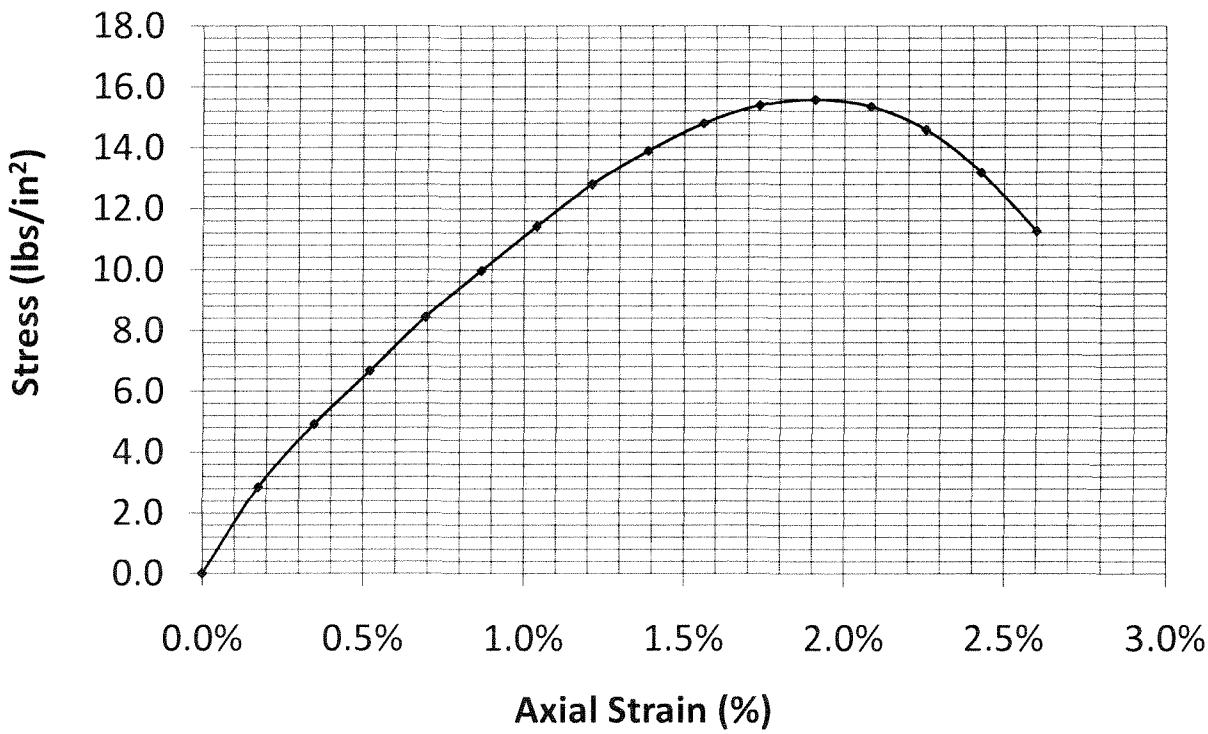


Figure F-1

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UNCONFINED COMPRESSION TEST

ASTM Designation: D2166

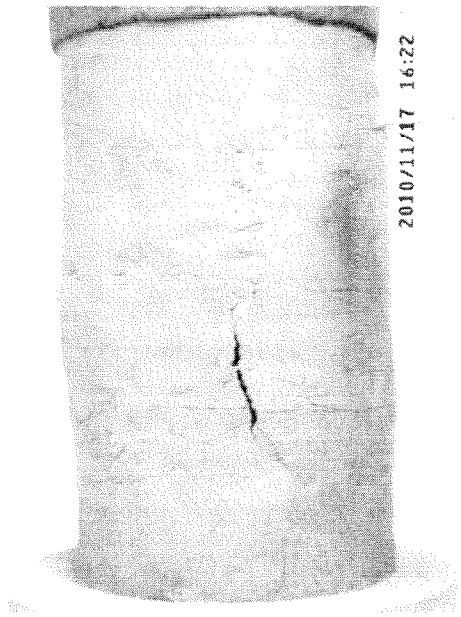
Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-3	Depth: 18.8'-19.4'	Lab No.: 28860
Type of Specimen:	3" Tube	Humidity During Trimming:	50%
Remarks:		Classification:	CL (Alluvium)

SAMPLE INFORMATION

Wet Unit Wt (lb/ft^3)	118.3
Dry Unit Wt (lb/ft^3)	91.9
Water Content (%)	28.7
Saturation (%)	93.9
Length/Diameter	1.89
Average Strain Rate (%/min)	0.058
Strain at failure	5.0%

Unconfined Compressive Strength

lbs/in^2	6.4
tons/ft^2	0.5



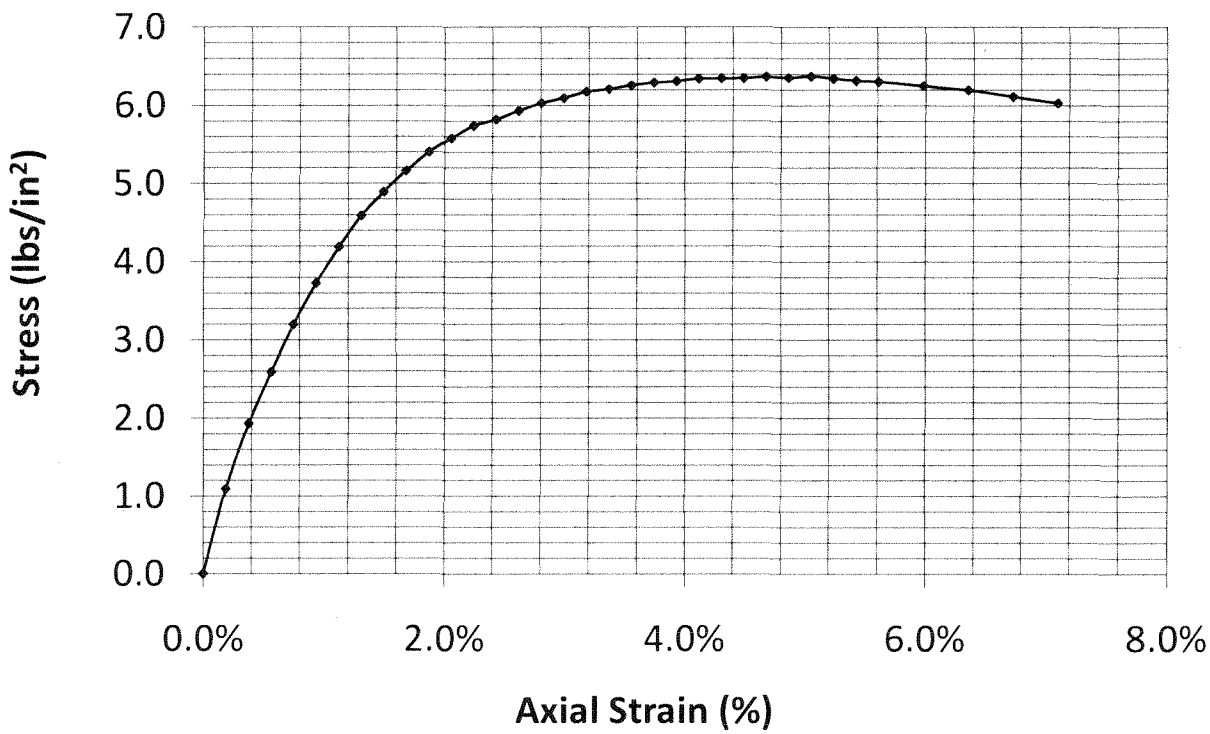


Figure F-2

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UNCONFINED COMPRESSION TEST

ASTM Designation: D2166

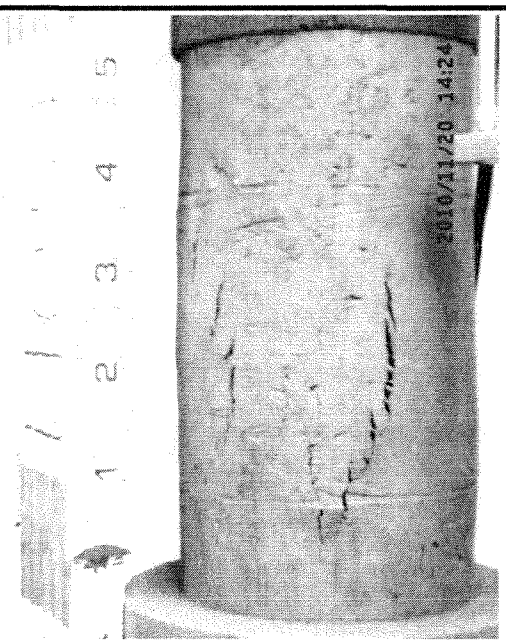
Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-9	Depth: 17.1'-17.7'	Lab No.: 28896
Type of Specimen:	3" Tube	Humidity During Trimming:	50%
Remarks:		Classification:	CL (Alluvium)

SAMPLE INFORMATION

Wet Unit Wt (lb/ft^3)	121.7
Dry Unit Wt (lb/ft^3)	96.1
Water Content (%)	26.6
Saturation (%)	96.5
Length/Diameter	1.99
Average Strain Rate (%/min)	0.058
Strain at failure	1.8%

Unconfined Compressive Strength

lbs/in^2	16.1
tons/ft^2	1.2



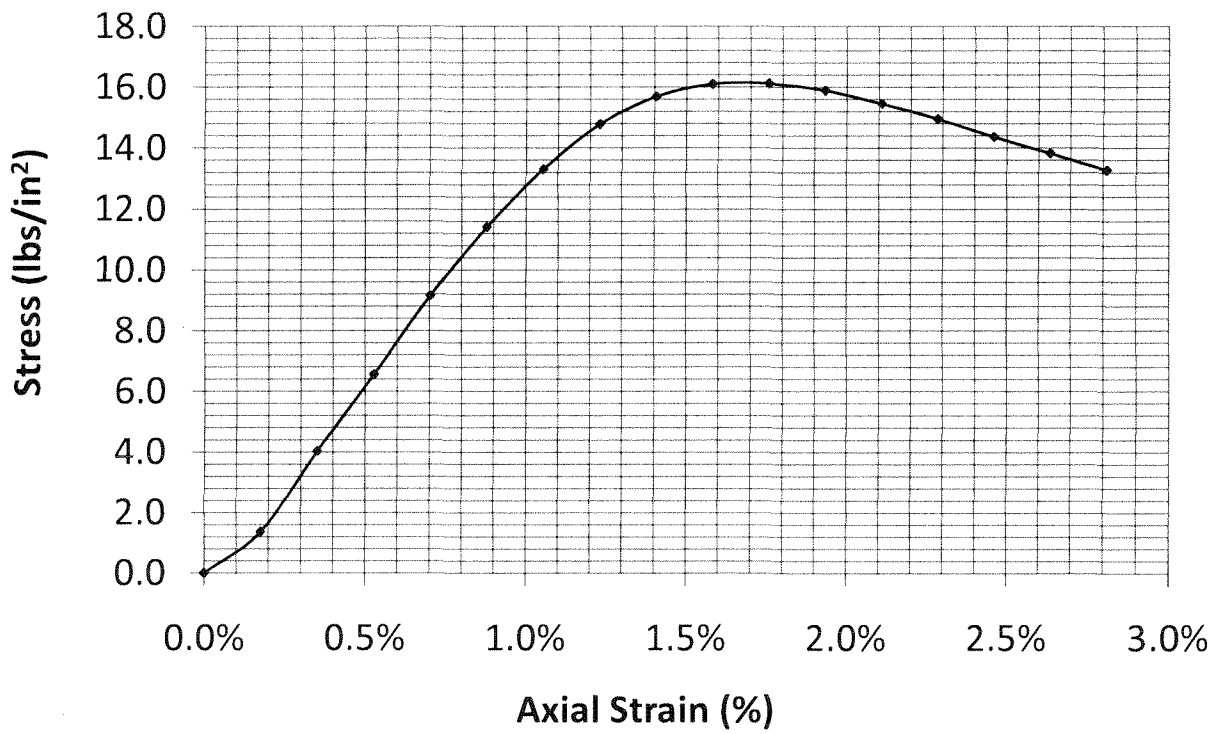


Figure F-3

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UNCONFINED COMPRESSION TEST

ASTM Designation: D2166

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-19	Depth: 13.1'-13.9'	Lab No.: 28871
Type of Specimen:	3" Tube	Humidity During Trimming:	50%
Remarks:		Classification:	0

SAMPLE INFORMATION

Wet Unit Wt (lb/ft^3)	117.5
Dry Unit Wt (lb/ft^3)	88.8
Water Content (%)	32.3
Saturation (%)	98.1
Length/Diameter	2.11
Average Strain Rate (%/min)	0.058
Strain at failure	2.3%

Unconfined Compressive Strength

lbs/in^2	7.6
tons/ft^2	0.5

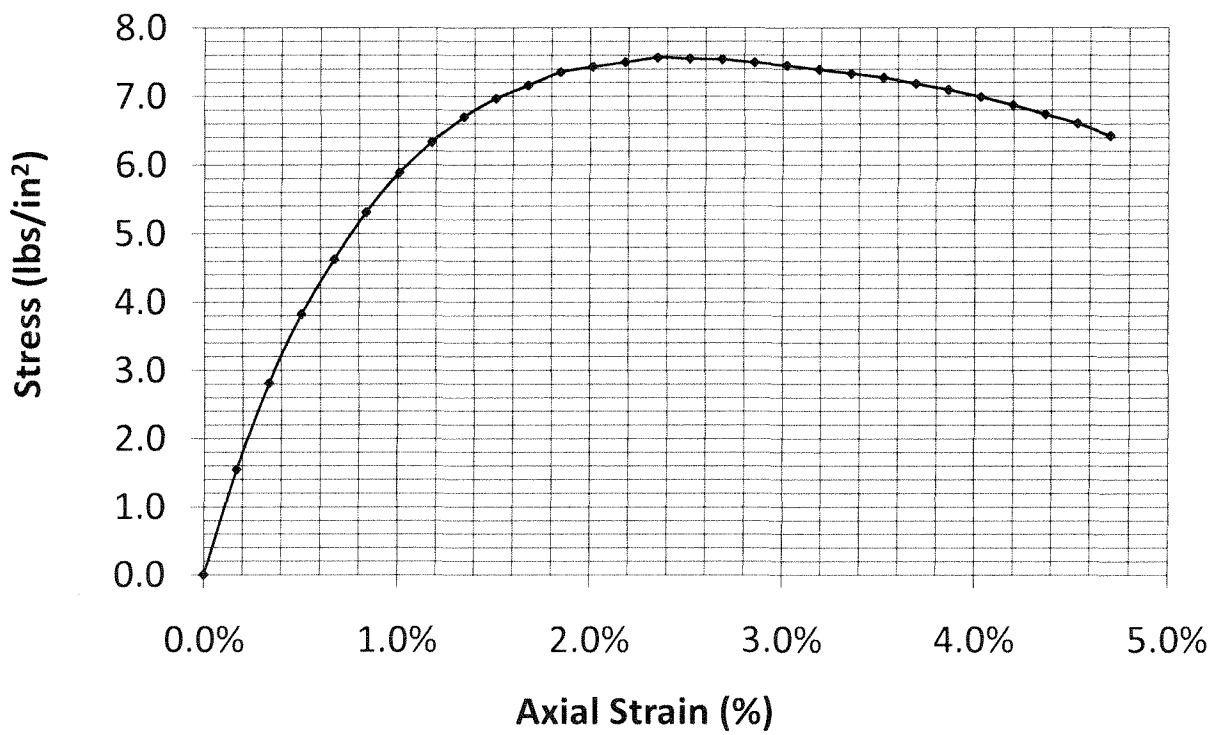

Figure F-4

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UNCONFINED COMPRESSION TEST

ASTM Designation: D2166

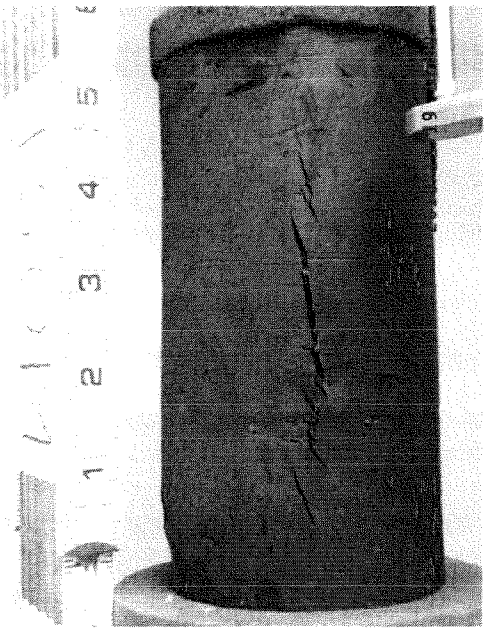
Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-20	Depth: 22.6'-23.2'	Lab No.: 28874
Type of Specimen:	3" Tube	Humidity During Trimming:	50%
Remarks:		Classification:	CH (Alluvium)

SAMPLE INFORMATION

Wet Unit Wt (lb/ft^3)	112.4
Dry Unit Wt (lb/ft^3)	81.0
Water Content (%)	38.8
Saturation (%)	97.7
Length/Diameter	2.09
Average Strain Rate (%/min)	0.058
Strain at failure	1.7%

Unconfined Compressive Strength

lbs/in^2	11.9
tons/ft^2	0.9



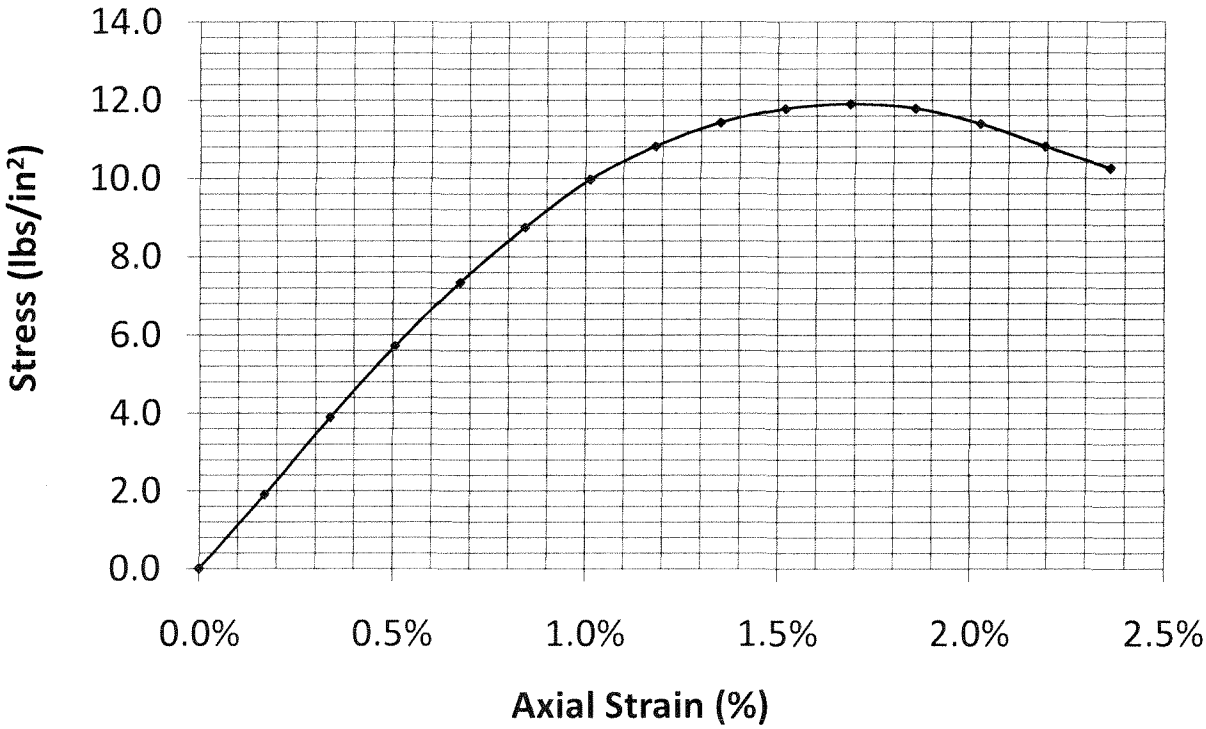


Figure F-5

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UNCONFINED COMPRESSION TEST

ASTM Designation: D2166

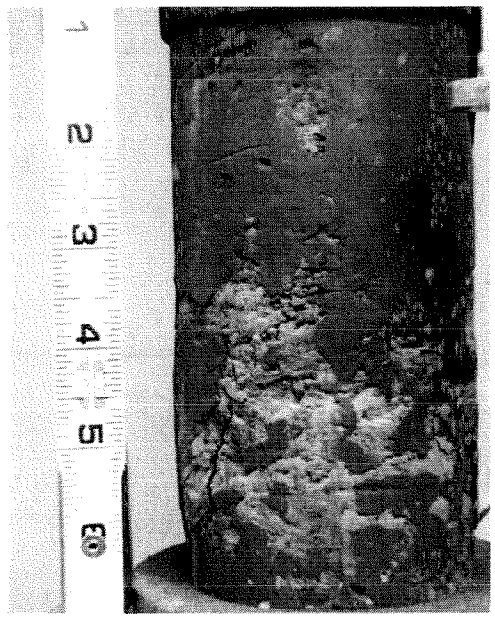
Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-23	Depth: 5.0'-5.5'	Lab No.: 28866
Type of Specimen:	3" Tube	Humidity During Trimming:	50%
Remarks:		Classification:	CL (Alluvium)

SAMPLE INFORMATION

Wet Unit Wt (lb/ft^3)	117.3
Dry Unit Wt (lb/ft^3)	91.4
Water Content (%)	28.3
Saturation (%)	91.5
Length/Diameter	2.12
Average Strain Rate (%/min)	0.058
Strain at failure	4.8%

Unconfined Compressive Strength

lbs/in^2	11.9
tons/ft^2	0.9



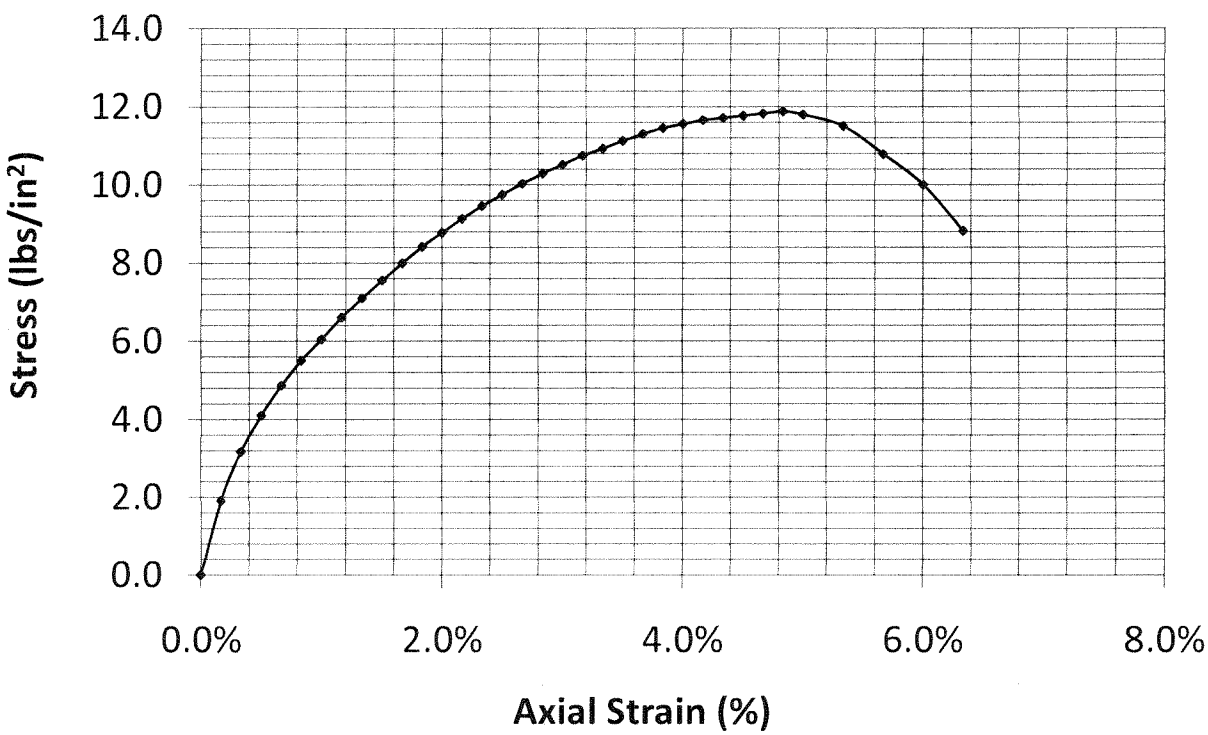


Figure F-6

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UNCONFINED COMPRESSION TEST

ASTM Designation: D2166

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-25	Depth: 6.6'-7.1'	Lab No.: 28875
Type of Specimen:	3" Tube	Humidity During Trimming:	50%
Remarks:		Classification:	CH (Alluvium)

SAMPLE INFORMATION

Wet Unit Wt (lb/ft^3)	121.2
Dry Unit Wt (lb/ft^3)	95.7
Water Content (%)	26.7
Saturation (%)	95.6
Length/Diameter	2.11
Average Strain Rate (%/min)	0.058
Strain at failure	3.8%

Unconfined Compressive Strength

lbs/in^2	17.8
tons/ft^2	1.3

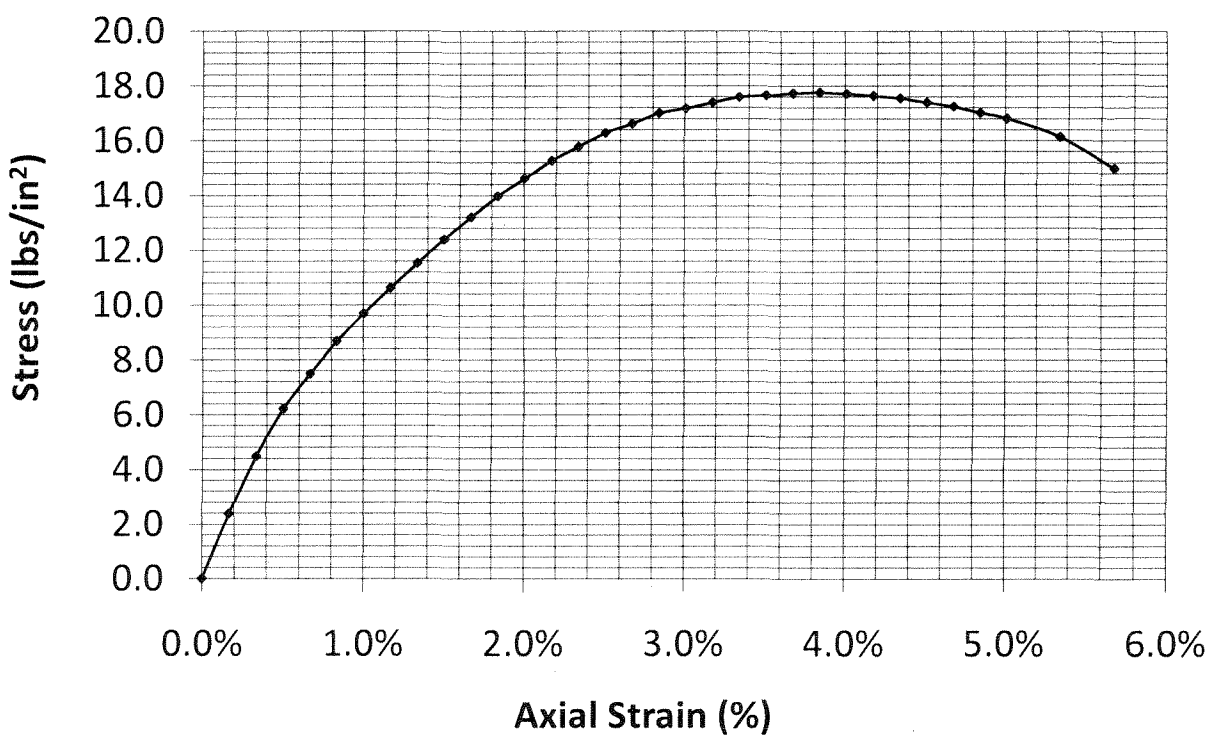

Figure F-7

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UNCONFINED COMPRESSION TEST

ASTM Designation: D2166

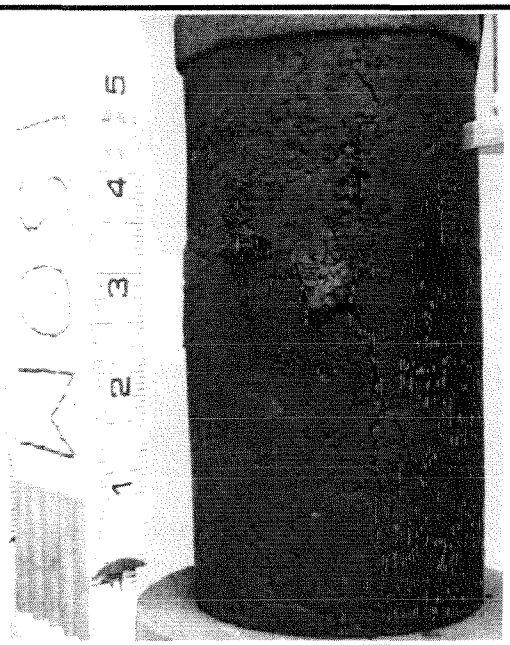
Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-27	Depth: 10.6'-11.3'	Lab No.: 28845
Type of Specimen:	3" Tube	Humidity During Trimming:	50%
Remarks:		Classification:	CL (Alluvium)

SAMPLE INFORMATION

Wet Unit Wt (lb/ft^3)	106.6
Dry Unit Wt (lb/ft^3)	77.5
Water Content (%)	37.6
Saturation (%)	86.9
Length/Diameter	2.06
Average Strain Rate (%/min)	0.058
Strain at failure	2.4%

Unconfined Compressive Strength

lbs/in^2	12.3
tons/ft^2	0.9



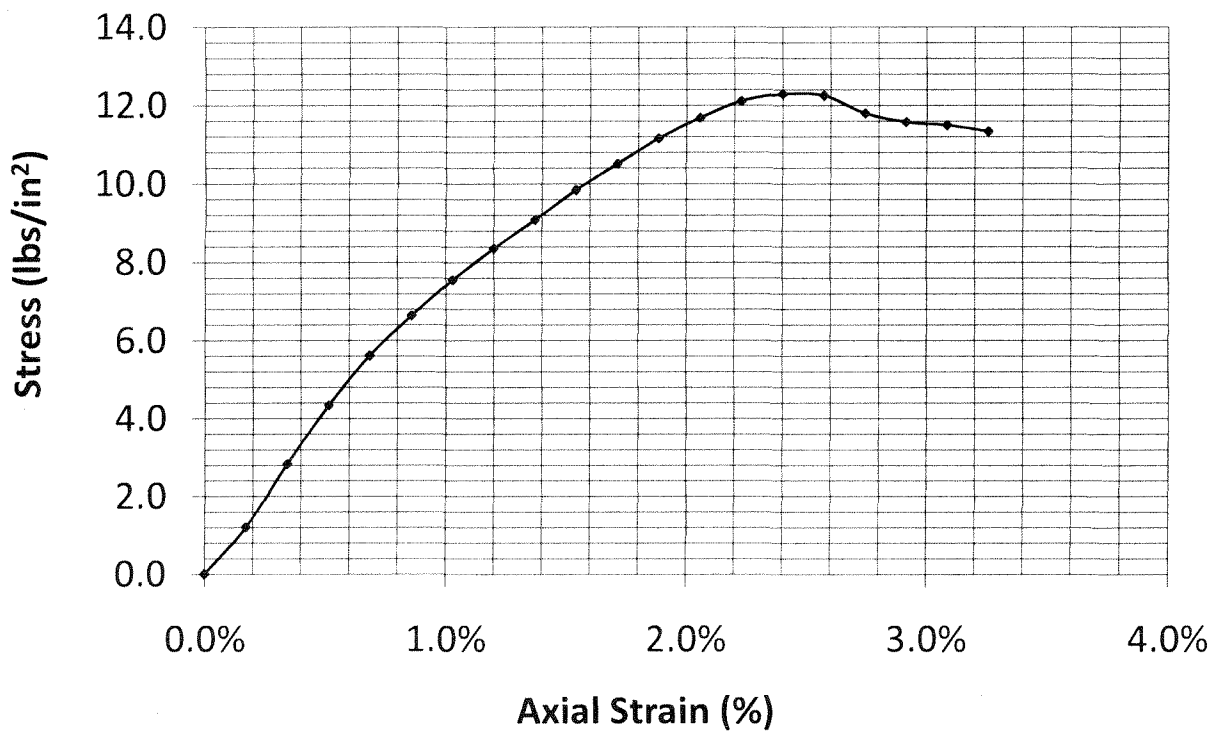


Figure F-8

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UNCONFINED COMPRESSION TEST

ASTM Designation: D2166

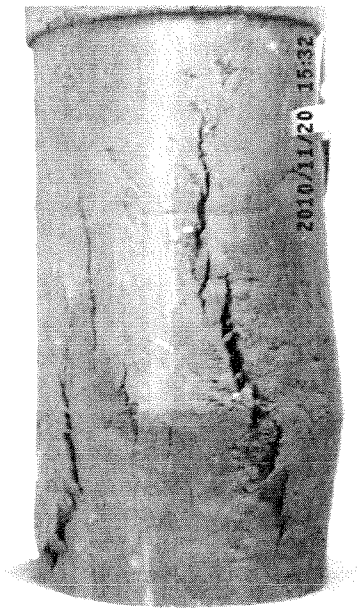
Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-30	Depth: 7.2'-7.9'	Lab No.: 28903
Type of Specimen:	3" Tube	Humidity During Trimming:	50%
Remarks:		Classification:	CH (Alluvium)

SAMPLE INFORMATION

Wet Unit Wt (lb/ft^3)	119.3
Dry Unit Wt (lb/ft^3)	97.6
Water Content (%)	22.3
Saturation (%)	83.8
Length/Diameter	2.08
Average Strain Rate (%/min)	0.058
Strain at failure	1.4%

Unconfined Compressive Strength

lbs/in^2	21.9
tons/ft^2	1.6



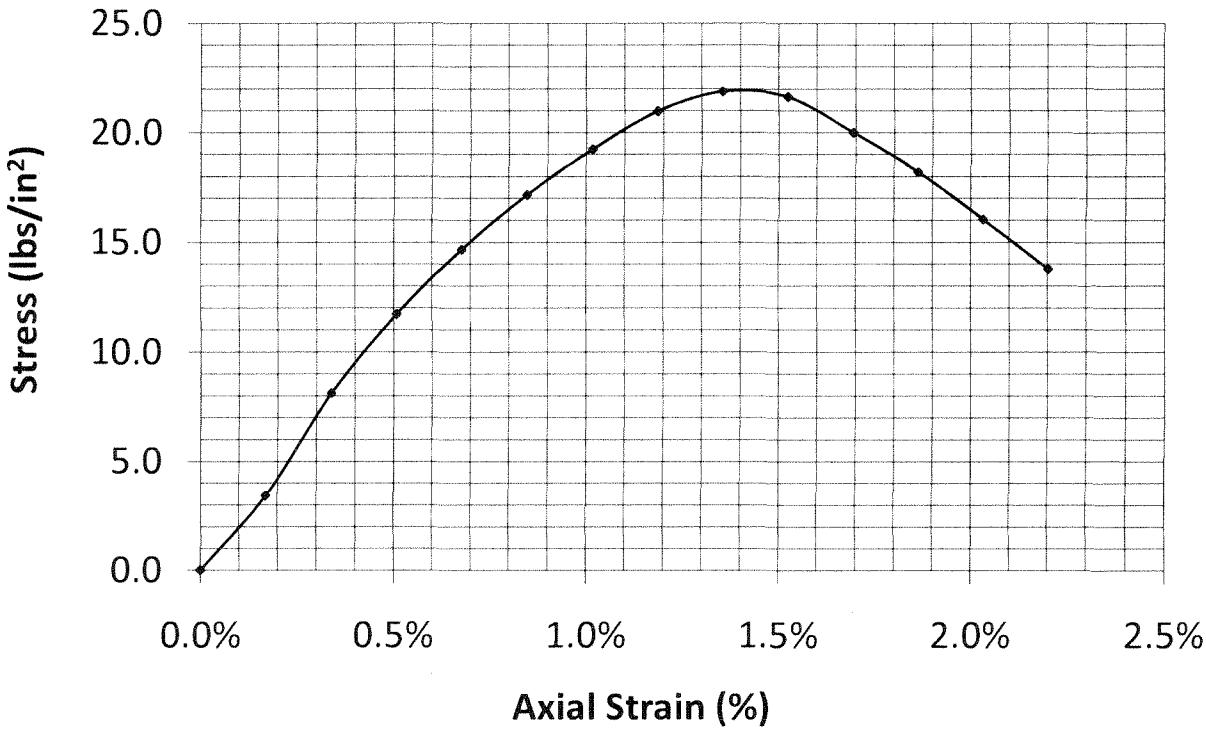


Figure F-9

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UNCONFINED COMPRESSION TEST

ASTM Designation: D2166

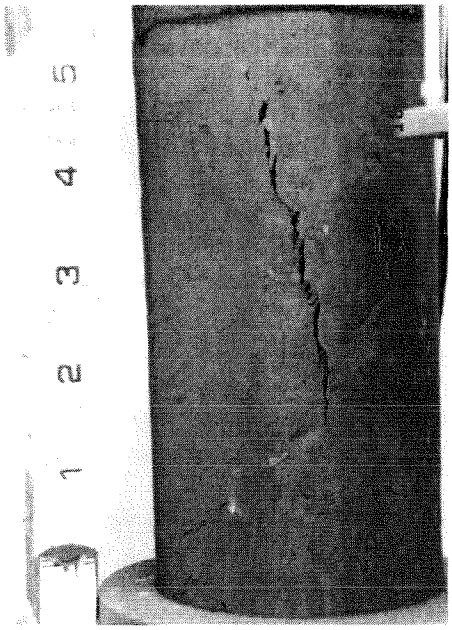
Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-33	Depth: 16.6'-17.3'	Lab No.: 28822
Type of Specimen:	3" Tube	Humidity During Trimming:	50%
Remarks:		Classification:	CL (Alluvium)

SAMPLE INFORMATION

Wet Unit Wt (lb/ft^3)	119.7
Dry Unit Wt (lb/ft^3)	93.1
Water Content (%)	28.6
Saturation (%)	96.3
Length/Diameter	2.07
Average Strain Rate (%/min)	0.058
Strain at failure	1.2%

Unconfined Compressive Strength

lbs/in^2	12.4
tons/ft^2	0.9



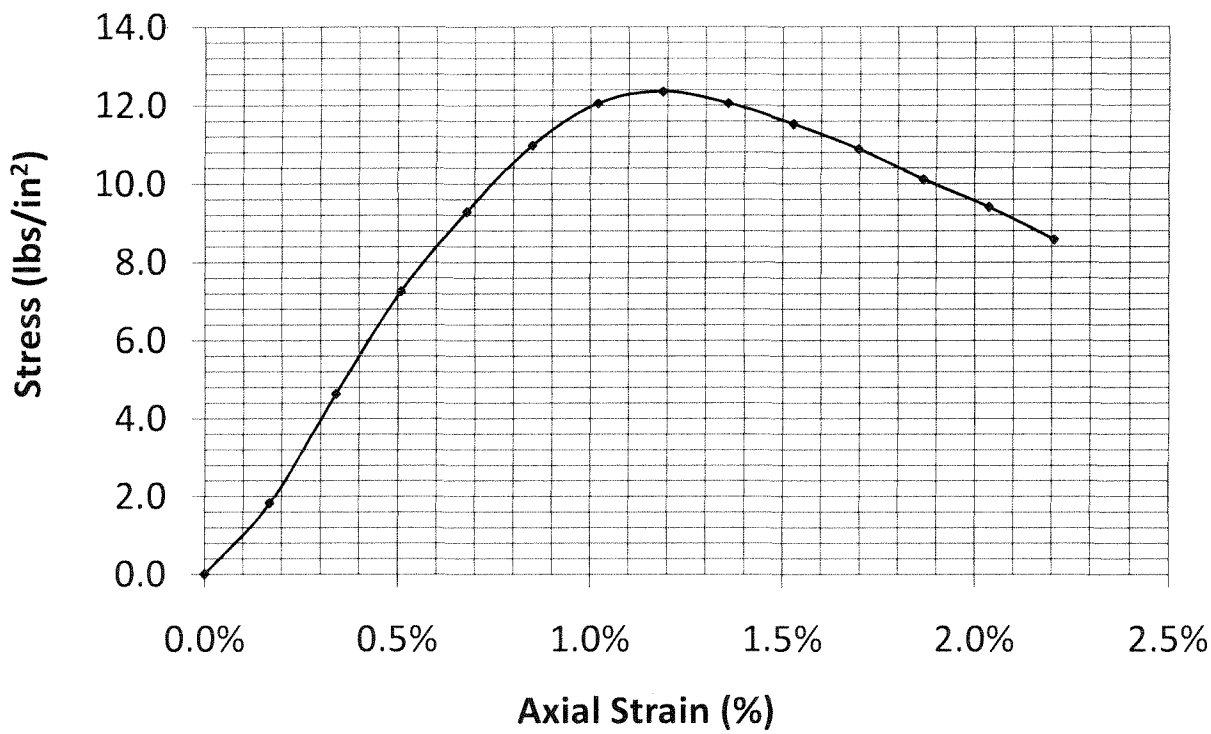


Figure F-10

APPENDIX G. TRIAXIAL COMPRESSION TEST REPORTS

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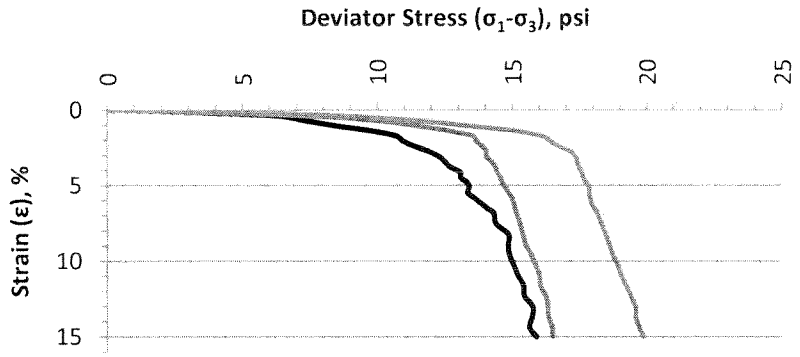
TRIAXIAL SHEAR TEST

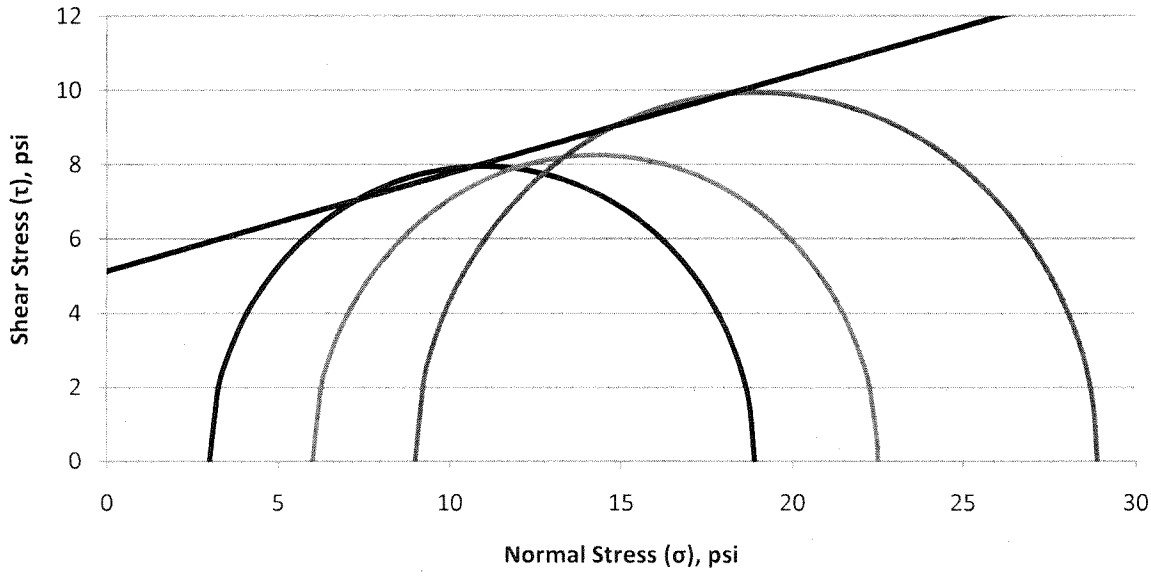
ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-1	Depth: 8.6-9.3	Lab No.: 28869
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3	Opt. Moisture:	Classification: CL (Alluvium)
Remarks:		Type of Test:	CU'

Dry Density (lb/ft^3)		B Parameter	Moisture Content (%)			Time of Consoli-dation (hours)	Minor Principal Stresses σ_3 (psi)	Deviator Stress σ_1-σ_3 (psi)	Axial Strain at Failure (%)
Initial	Conslidated		Start of Test	Deg of Sat at Start of Test	End of Test				
94.2	94.0	95	26.6	91.1	29.2	15.5	3.0	15.9	15.0
93.4	94.5	95	26.9	90.3	28.8	15.5	6.0	16.5	15.0
94.7	95.8	95	26.3	90.9	27.8	15.5	9.0	19.9	15.0



Shear Parameters
ϕ: 14.8 deg
tan ϕ: 0.263
c: 740 psf



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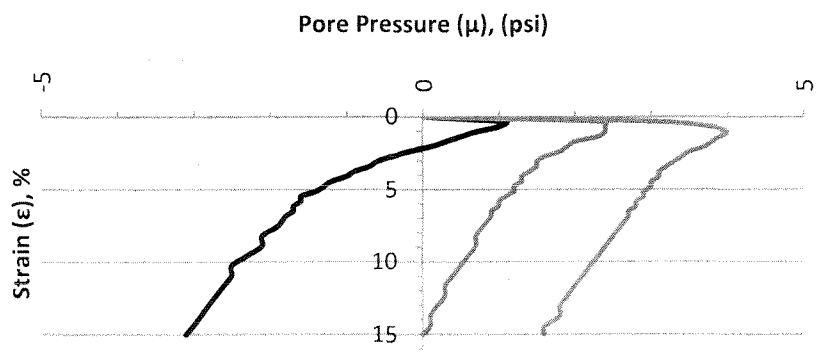
TRIAXIAL SHEAR TEST

ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-1 Depth: 8.6-9.3	Lab No.:	28869
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3 Opt. Moisture:	Classification:	CL (Alluvium)
Remarks:		Type of Test:	CU'

Minor Principal Stress σ_3 (psi)	Pore Pressure μ (psi)	Effective Minor Principal Stress σ_3' (psi)	Deviator Stress $\sigma_1-\sigma_3$ (psi)	Failure Criteria Maximum Deviator Stress	Axial Strain At Failure ε (%)
3.0	-3.1	6.1	15.9	$(\sigma_1-\sigma_3)_{max}$	15.0
6.0	0.0	6.0	16.5		15.0
9.0	1.6	7.4	19.9		15.0

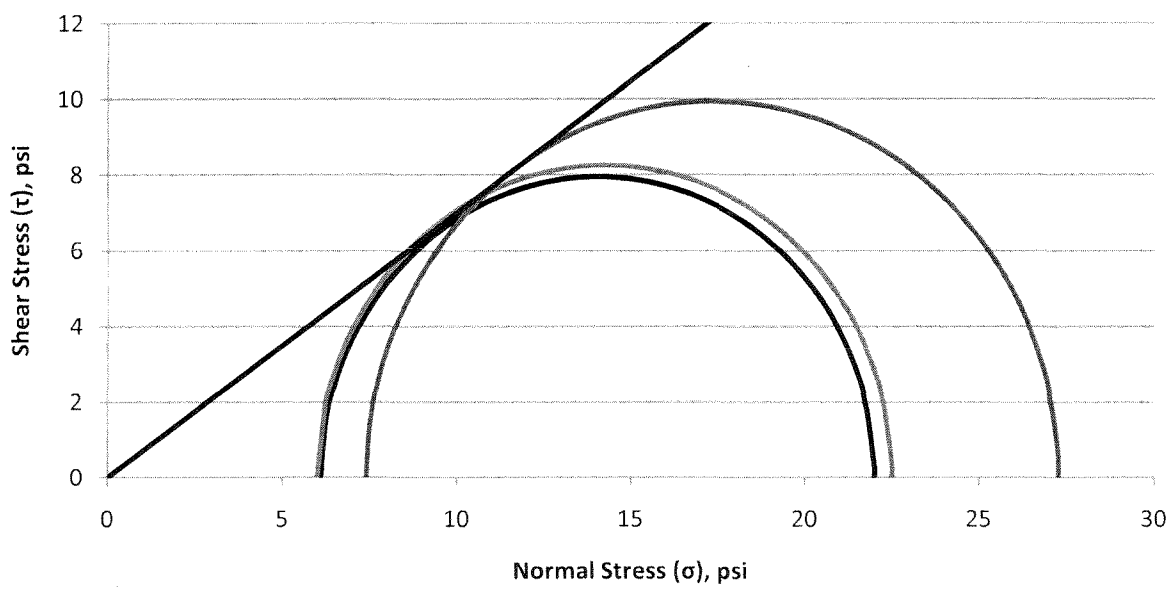


Shear Parameters

ϕ': 35.2 deg

tan ϕ': 0.706

c ': 0 psf



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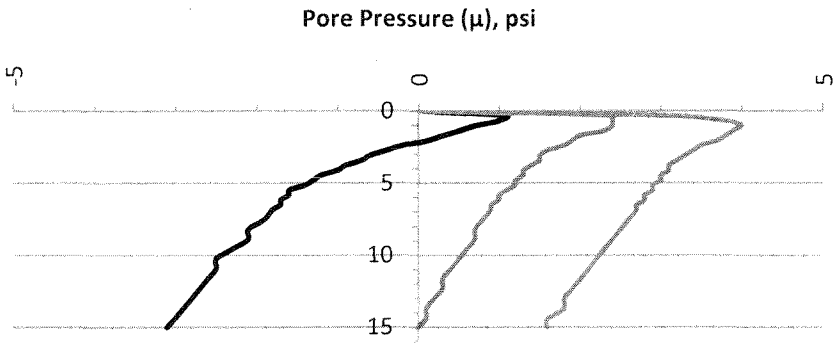
TRIAXIAL SHEAR TEST

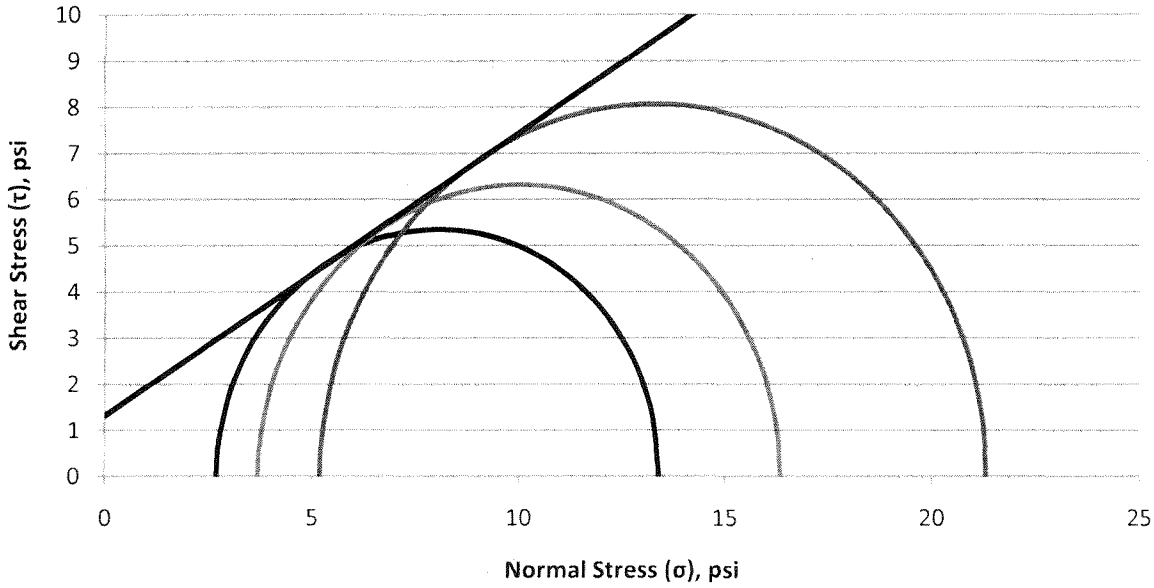
ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-1	Depth: 8.6-9.3	Lab No.: 28869
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3	Opt. Moisture:	Classification: CL (Alluvium)
Remarks:		Type of Test:	CU'

Minor Principal Stress σ_3 (psi)	Pore Pressure μ (psi)	Effective Minor Principal Stress σ_3' (psi)	Deviator Stress $\sigma_1-\sigma_3$ (psi)	Failure Criteria Maximum Principal Effective Stress Ratio	Axial Strain At Failure ε (%)
3.0	0.3	2.7	10.7	$(\sigma_1'/\sigma_3')_{max}$	1.7
6.0	2.3	3.7	12.6		1.4
9.0	3.8	5.2	16.1		1.7



Shear Parameters
ϕ': 31.5 deg
tan ϕ': 0.612
c': 191 psf



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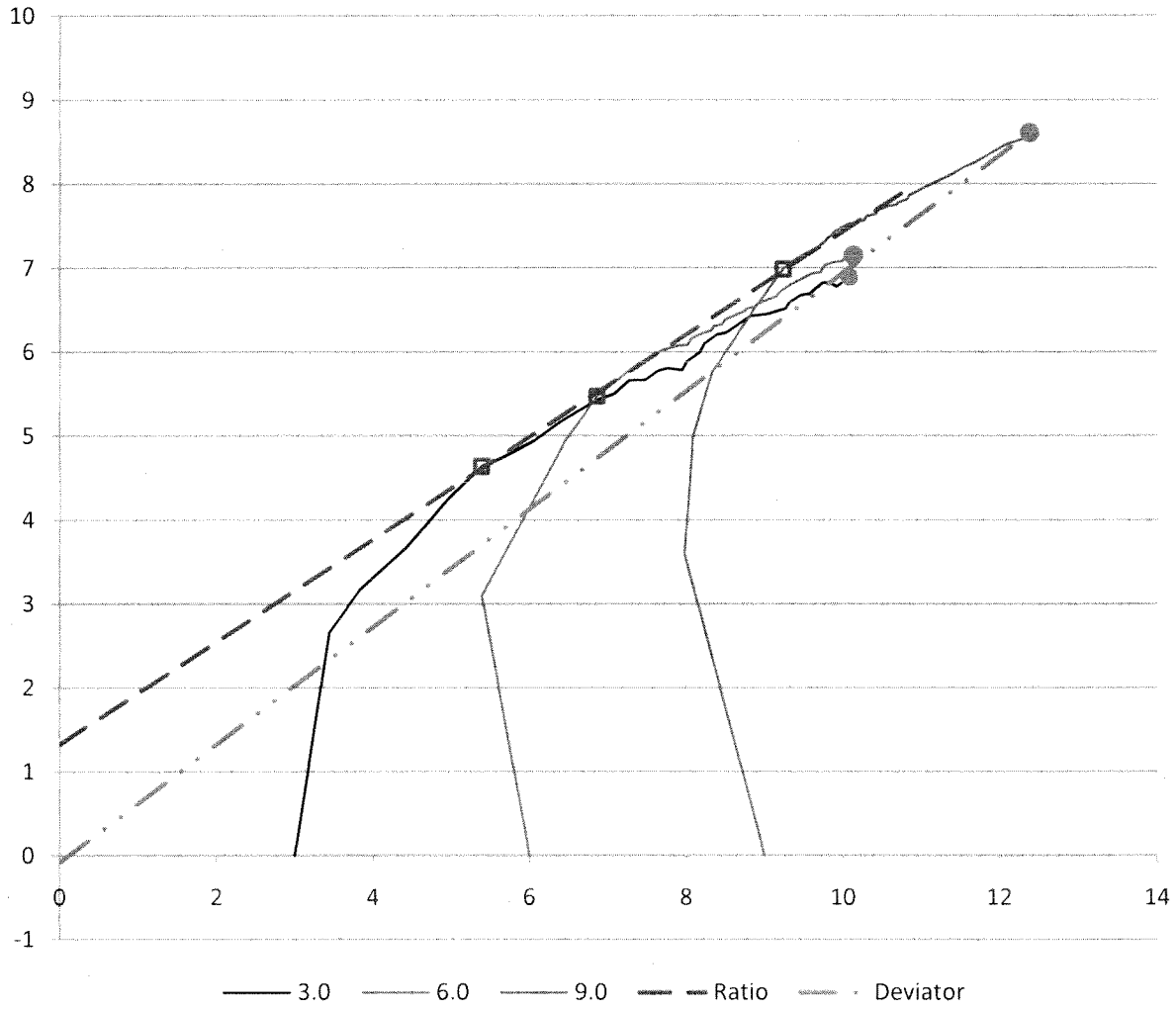
TRIAXIAL SHEAR TEST
ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-1 Depth: 8.6-9.3	Lab No.:	28869
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3 Opt. Moisture:	Classification:	CL (Alluvium)
Remarks:		Type of Test:	CU'



VECTOR DIAGRAM

Shear Parameters

Maximum Stress Ratio	Maximum Deviator Stress
ϕ': 31.5 deg	ϕ': 35.2 deg
tan ϕ': 0.612	tan ϕ': 0.706
c': 191 psf	c': 0 psf

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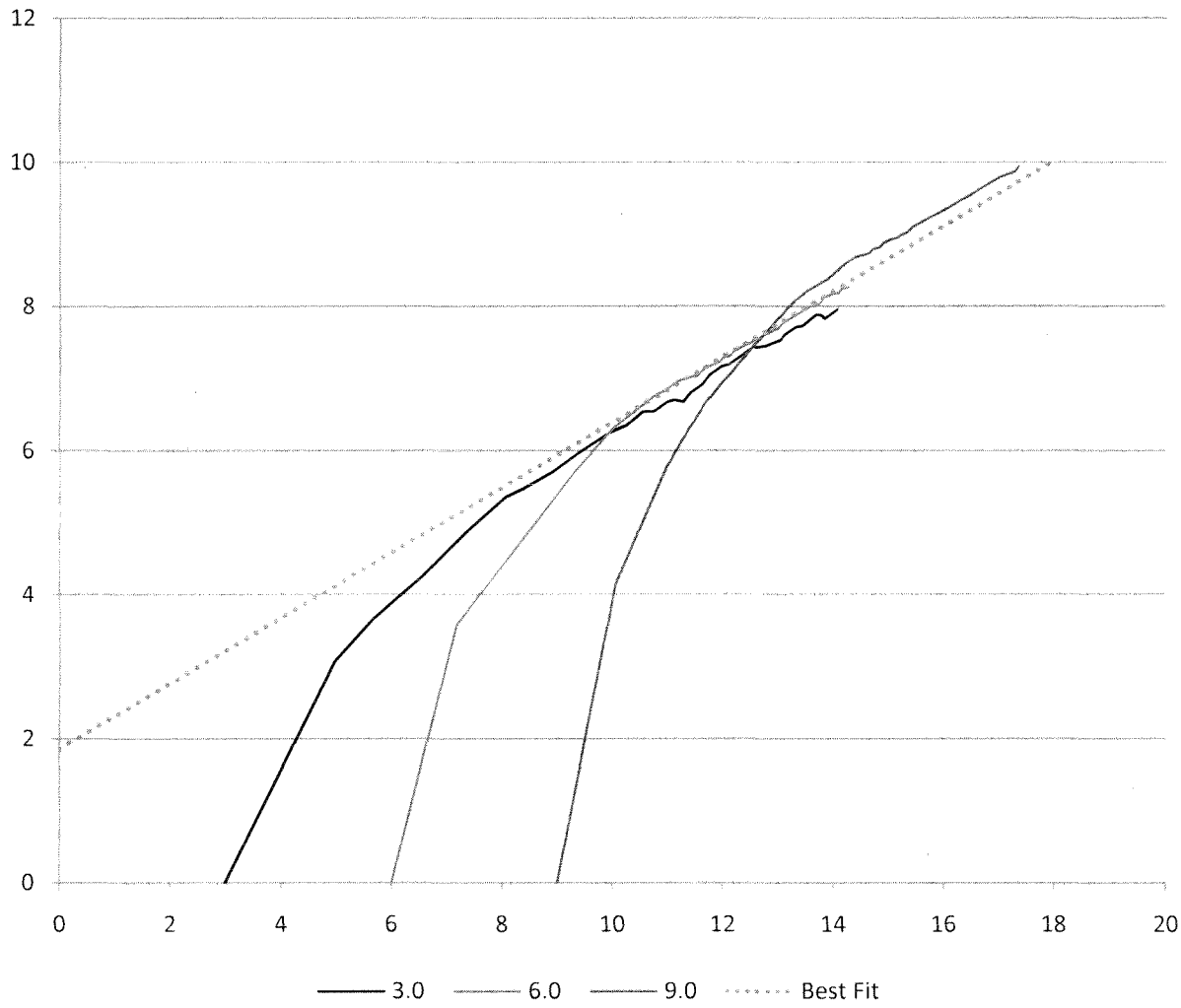
TRIAXIAL SHEAR TEST
ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-1 Depth: 8.6-9.3	Lab No.:	28869
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3 Opt. Moisture:	Classification:	CL (Alluvium)
Remarks:		Type of Test:	CU'



EFFECTIVE STRESS PATH PLOT

Shear Parameters for Best-Fit Line

ϕ': 27.0 deg

tan ϕ': 0.510

c': 300 psf

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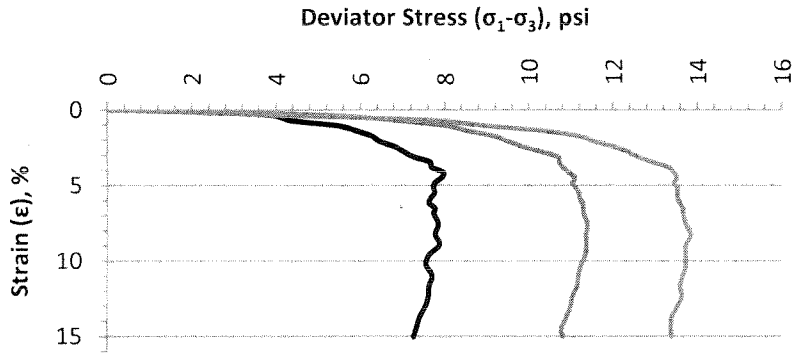
TRIAXIAL SHEAR TEST

ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-21 Depth: 6.7-7.4	Lab No.:	28842
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3 Opt. Moisture:	Classification:	CL (Alluvium)
Remarks:		Type of Test:	CU'

Dry Density (lb/ft^3)		B Parameter	Moisture Content (%)			Time of Consoli-dation (hours)	Minor Principal Stresses σ_3 (psi)	Deviator Stress σ_1-σ_3 (psi)	Axial Strain at Failure (%)
Initial	Conslidated		Start of Test	Deg of Sat at Start of Test	End of Test				
68.2	65.1	95	46.4	85.3	58.5	15.5	3.0	8.0	4.1
73.5	73.9	95	43.5	91.0	46.7	15.5	6.0	11.4	7.6
70.8	71.7	95	46.1	90.1	49.5	15.5	9.0	13.8	8.2

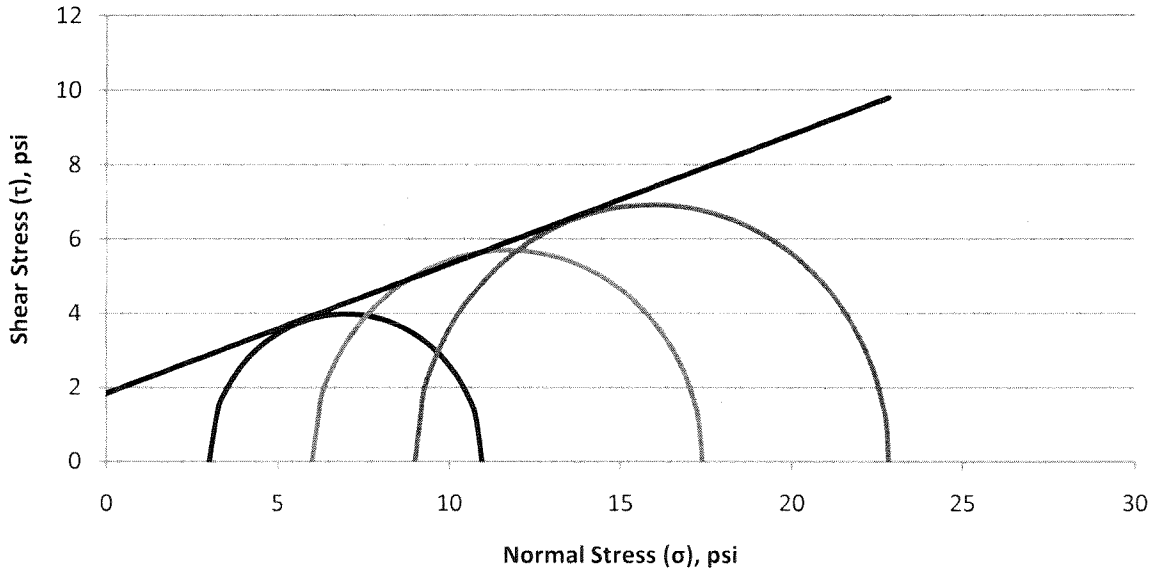


Shear Parameters

ϕ: 19.2 deg

tan ϕ: 0.349

c: 264 psf



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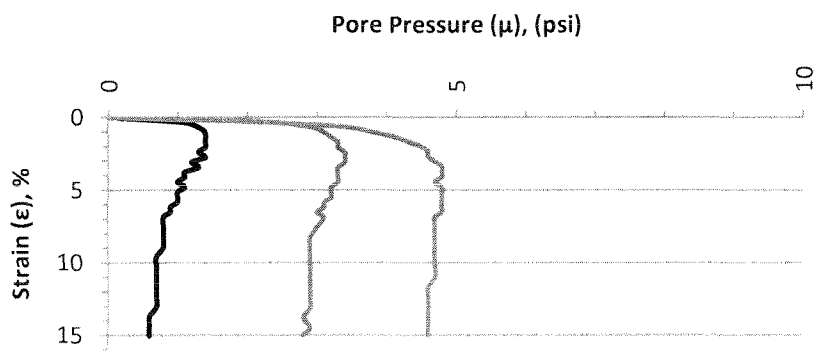
TRIAXIAL SHEAR TEST

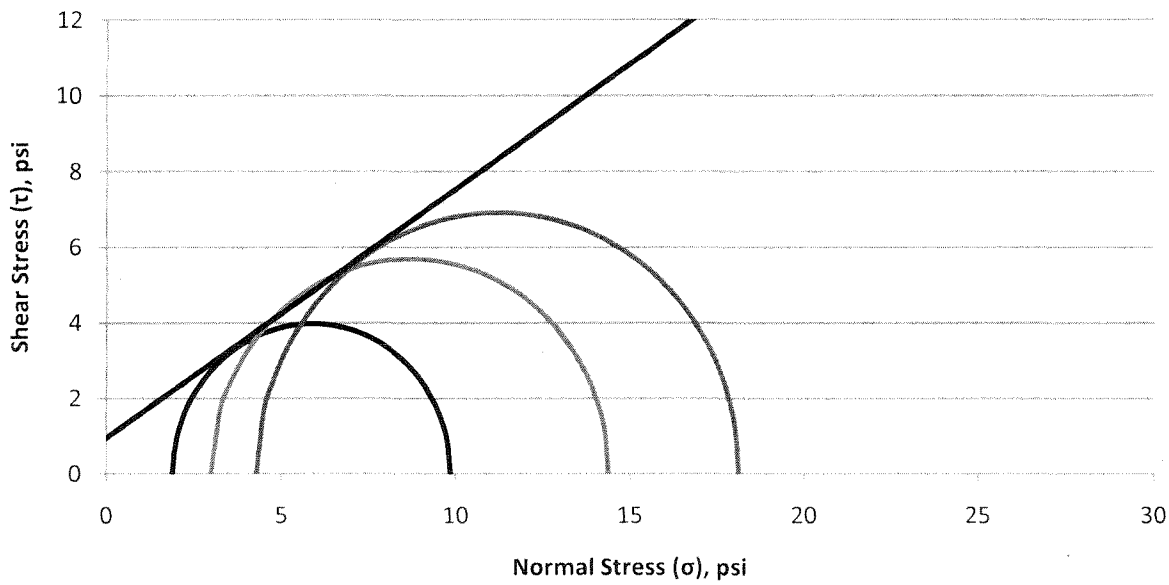
ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-21 Depth: 6.7-7.4	Lab No.:	28842
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3 Opt. Moisture:	Classification:	CL (Alluvium)
Remarks:		Type of Test:	CU'

Minor Principal Stress σ_3 (psi)	Pore Pressure μ (psi)	Effective Minor Principal Stress σ_3' (psi)	Deviator Stress $\sigma_1-\sigma_3$ (psi)	Failure Criteria Maximum Deviator Stress	Axial Strain At Failure ε (%)
3.0	1.1	1.9	8.0	$(\sigma_1-\sigma_3)_{max}$	4.1
6.0	3.0	3.0	11.4		7.6
9.0	4.7	4.3	13.8		8.2



Shear Parameters
ϕ': 33.4 deg
tan ϕ': 0.660
c ': 137 psf



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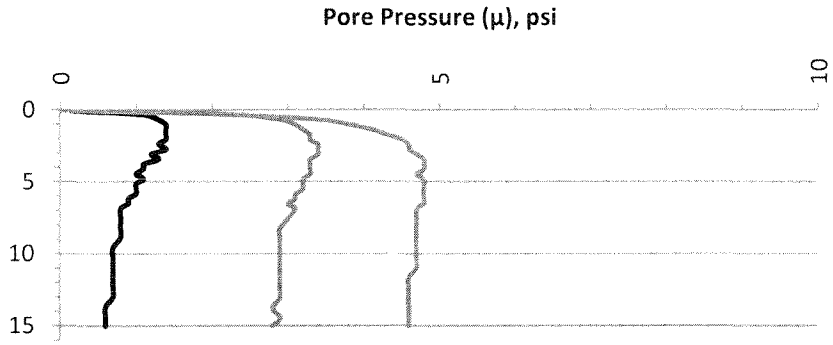
TRIAXIAL SHEAR TEST

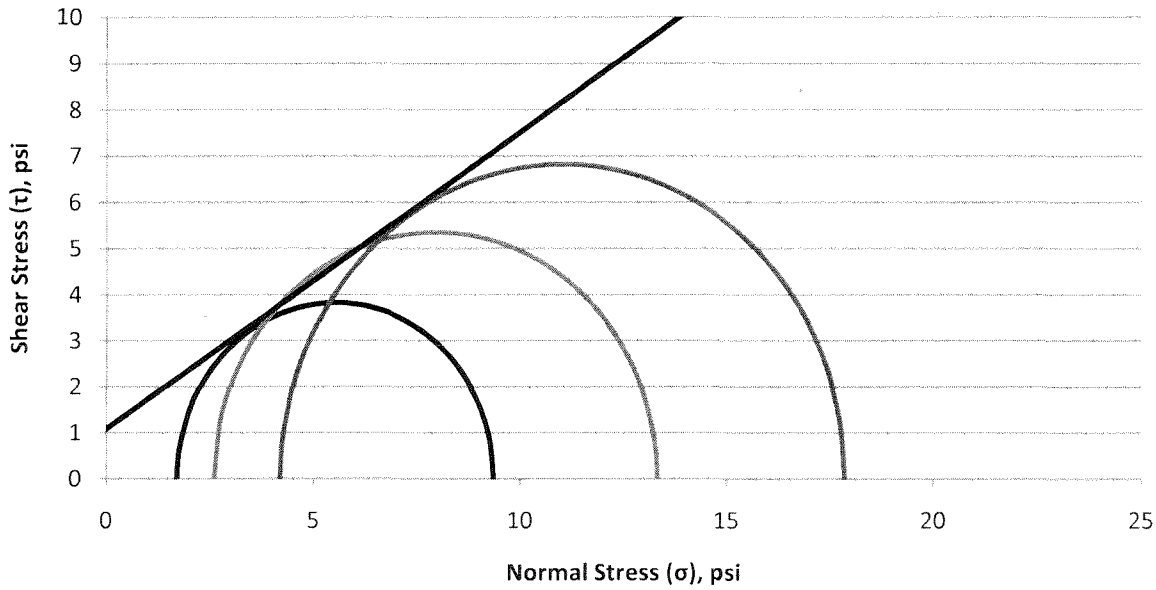
ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-21 Depth: 6.7-7.4	Lab No.:	28842
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3 Opt. Moisture:	Classification:	CL (Alluvium)
Remarks:		Type of Test:	CU'

Minor Principal Stress σ_3 (psi)	Pore Pressure μ (psi)	Effective Minor Principal Stress σ_3' (psi)	Deviator Stress $\sigma_1-\sigma_3$ (psi)	Failure Criteria Maximum Principal Effective Stress Ratio	Axial Strain At Failure ε (%)
3.0	1.3	1.7	7.7	$(\sigma_1'/\sigma_3')_{max}$	3.4
6.0	3.4	2.6	10.7		3.1
9.0	4.8	4.2	13.7		6.5



Shear Parameters
ϕ': 32.8 deg
tan ϕ': 0.643
c': 157 psf



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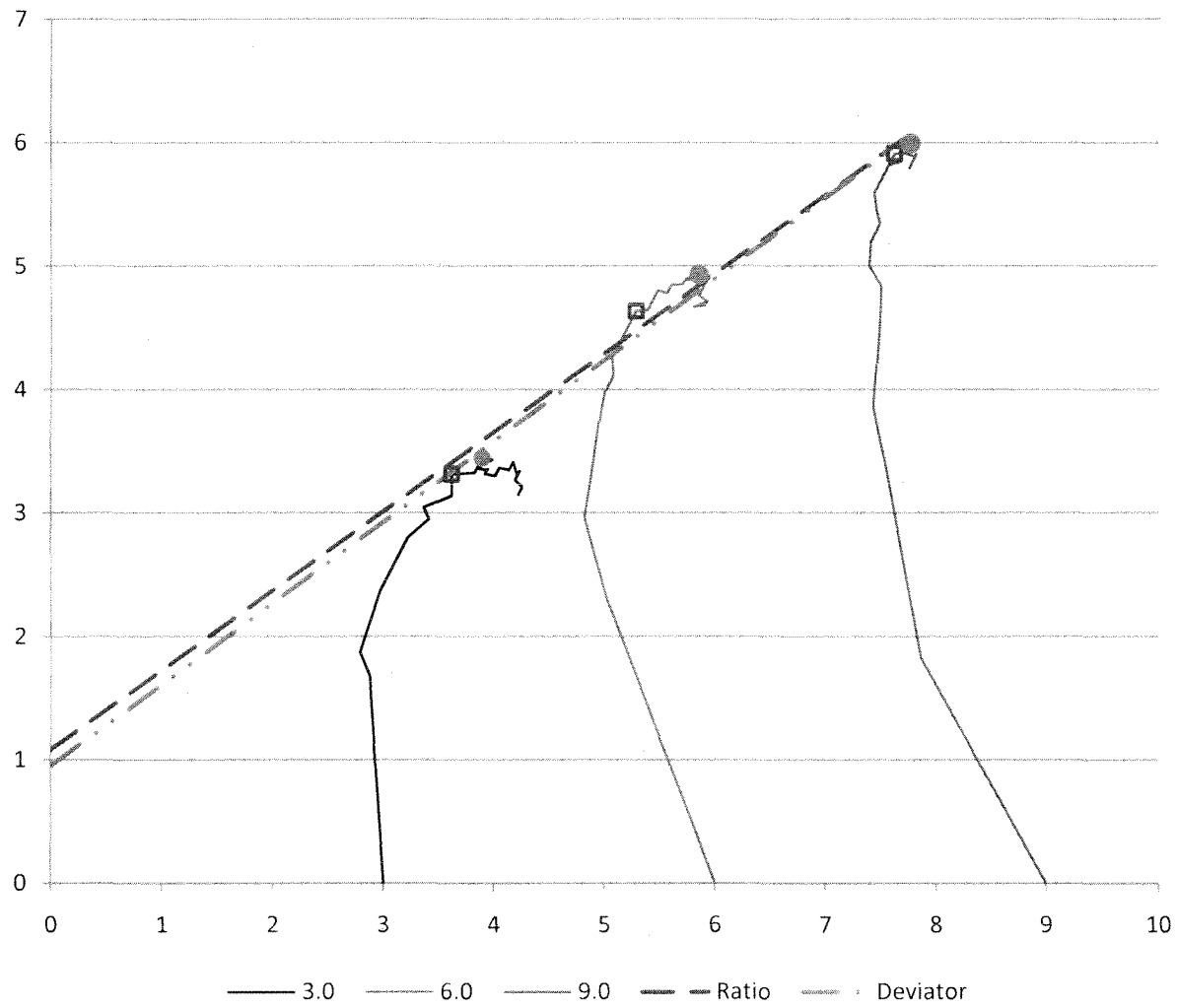
TRIAXIAL SHEAR TEST
ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-21 Depth: 6.7-7.4	Lab No.:	28842
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3 Opt. Moisture:	Classification:	CL (Alluvium)
Remarks:		Type of Test:	CU'



VECTOR DIAGRAM

Shear Parameters

Maximum Stress Ratio	Maximum Deviator Stress
ϕ': 32.8 deg	ϕ': 33.4 deg
tan ϕ': 0.643	tan ϕ': 0.660
c': 157 psf	c': 137 psf

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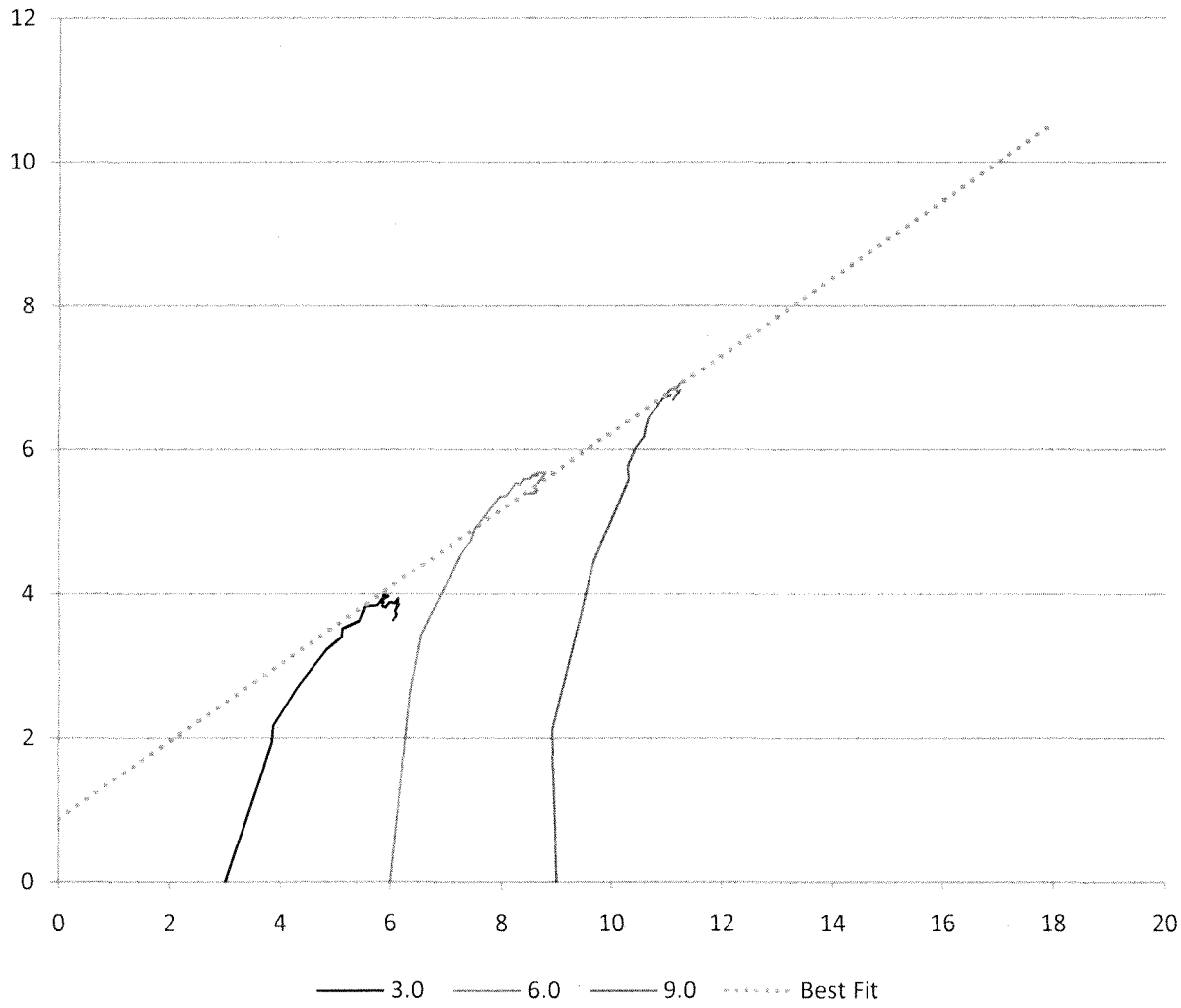
TRIAXIAL SHEAR TEST

ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-21	Depth: 6.7-7.4	Lab No.: 28842
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3	Opt. Moisture:	Classification: CL (Alluvium)
Remarks:		Type of Test:	CU'



EFFECTIVE STRESS PATH PLOT

Shear Parameters for Best-Fit Line

ϕ': 32.5 deg

tan ϕ': 0.637

c': 150 psf

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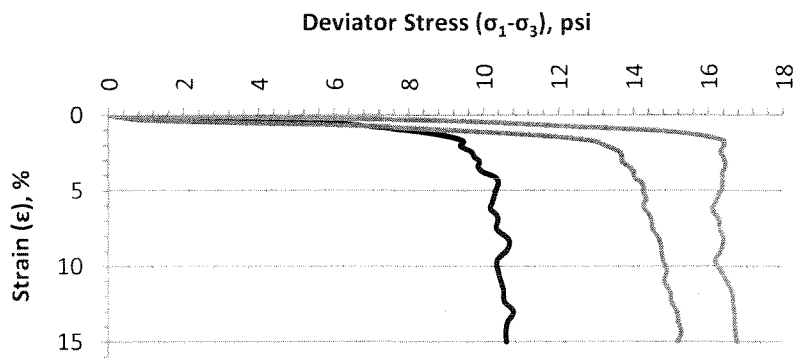
TRIAXIAL SHEAR TEST

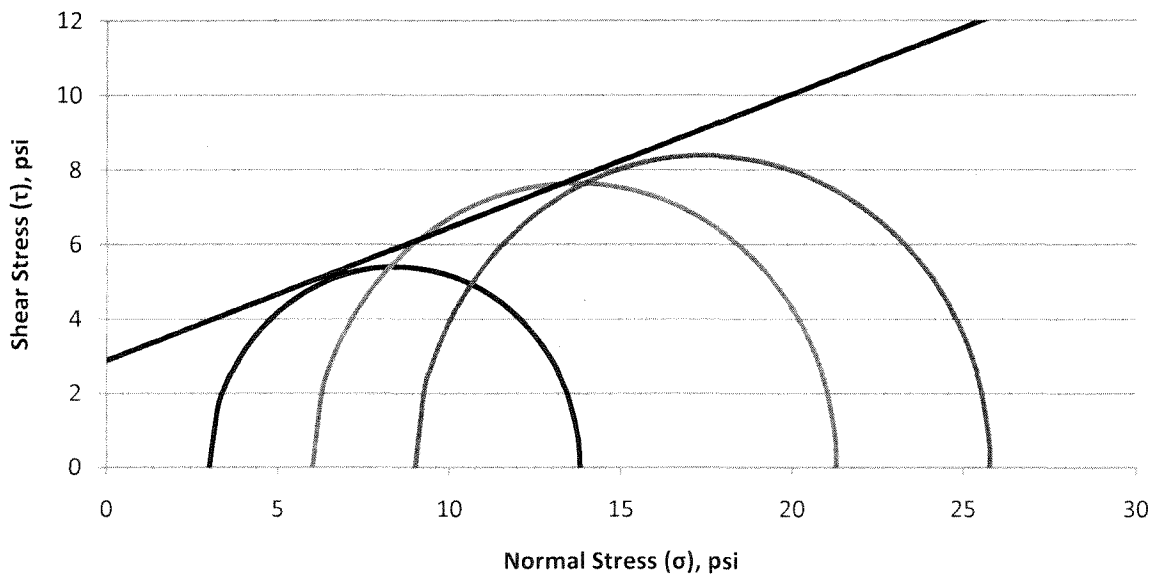
ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-25 Depth: 6.0-6.6	Lab No.:	28875
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3 Opt. Moisture:	Classification:	CL (Alluvium)
Remarks:		Type of Test:	CU'

Dry Density (lb/ft^3)		B Parameter	Moisture Content (%)			Time of Consoli-dation (hours)	Minor Principal Stresses σ_3 (psi)	Deviator Stress σ_1-σ_3 (psi)	Axial Strain at Failure (%)
Initial	Conslidated		Start of Test	Deg of Sat at Start of Test	End of Test				
91.3	91.8	95	27.9	88.9	30.8	15.5	3.0	10.8	13.0
92.2	92.9	95	28.0	91.3	29.8	15.5	6.0	15.3	14.4
92.0	92.8	95	27.2	88.2	29.7	15.5	9.0	16.8	15.0



Shear Parameters
ϕ: 19.7 deg
tan ϕ: 0.358
c: 416 psf



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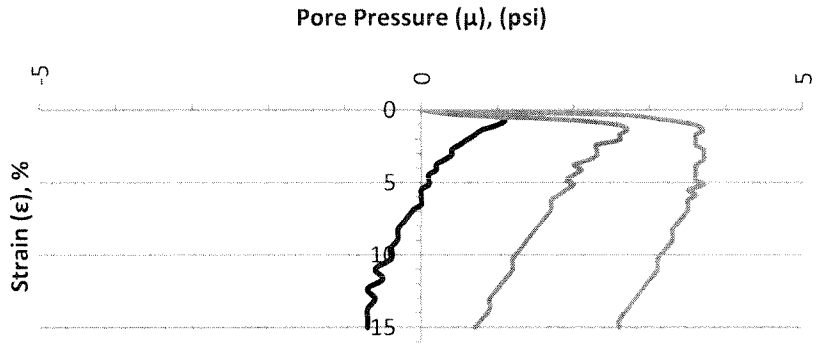
TRIAXIAL SHEAR TEST

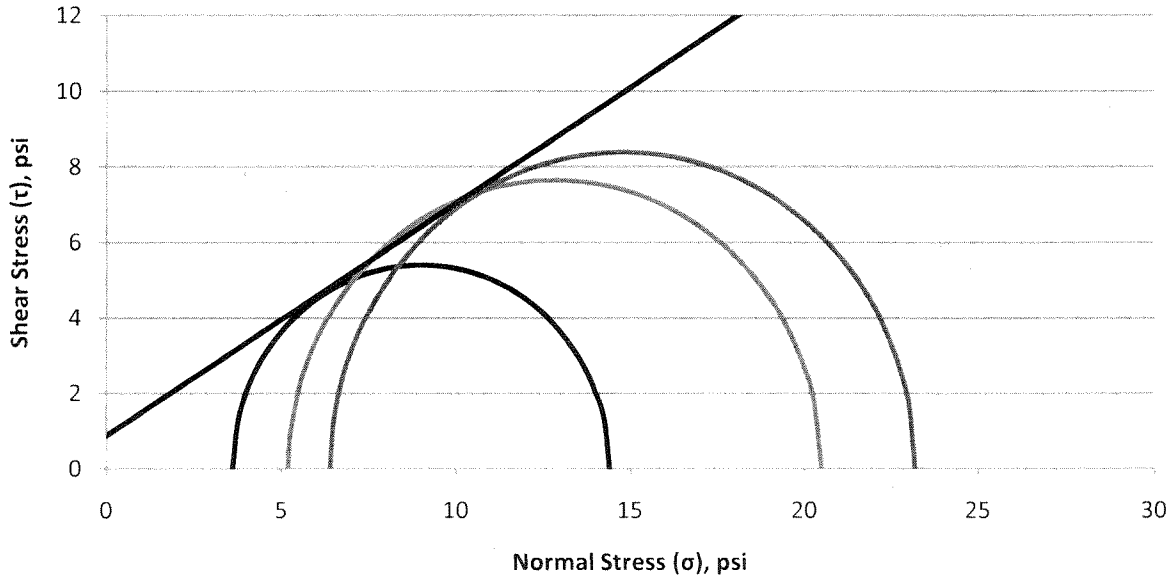
ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-25 Depth: 6.0-6.6	Lab No.:	28875
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3 Opt. Moisture:	Classification:	CL (Alluvium)
Remarks:		Type of Test:	CU'

Minor Principal Stress σ_3 (psi)	Pore Pressure μ (psi)	Effective Minor Principal Stress σ_3' (psi)	Deviator Stress σ_1-σ_3 (psi)	Failure Criteria Maximum Deviator Stress	Axial Strain At Failure ε (%)
3.0	-0.6	3.6	10.8	$(\sigma_1-\sigma_3)_{max}$	13.0
6.0	0.8	5.2	15.3		14.4
9.0	2.6	6.4	16.8		15.0



Shear Parameters
ϕ': 31.6 deg
tan ϕ': 0.615
c ': 127 psf



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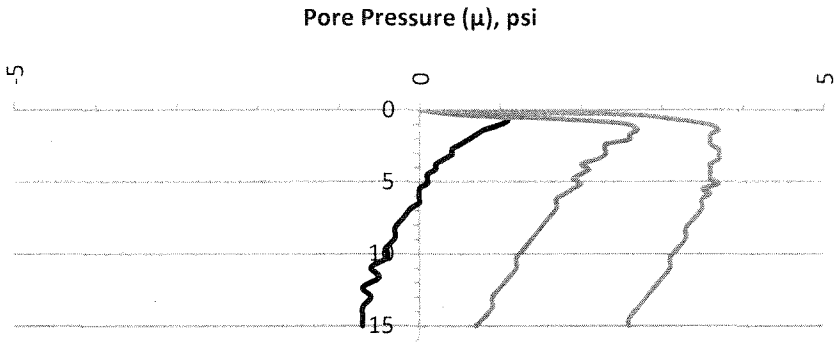
TRIAXIAL SHEAR TEST

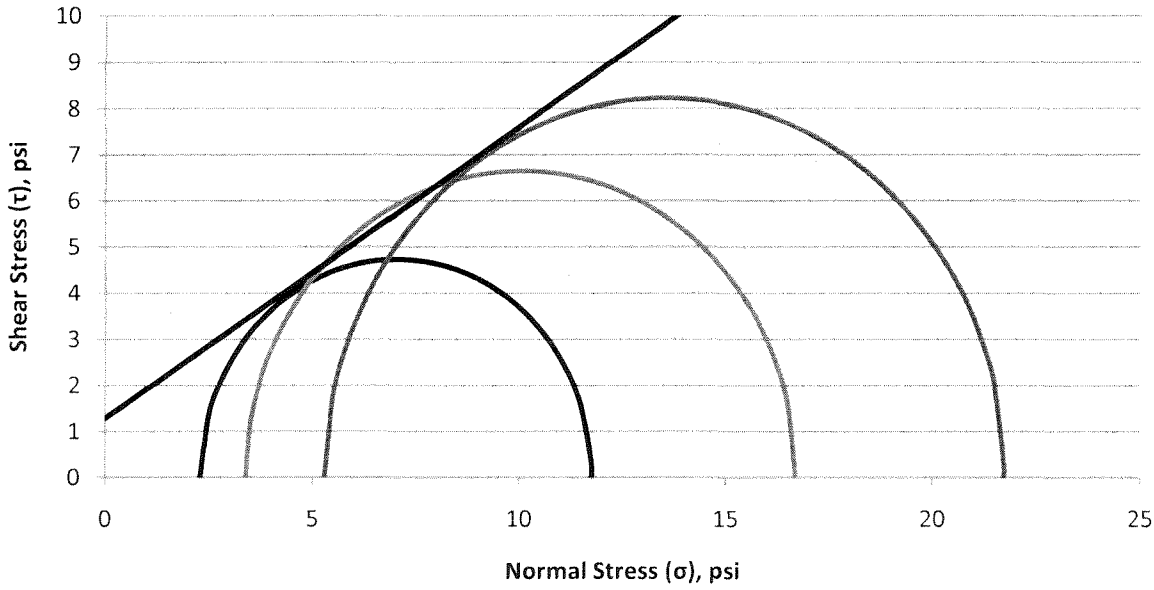
ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-25	Depth: 6.0-6.6	Lab No.: 28875
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3	Opt. Moisture:	Classification: CL (Alluvium)
Remarks:		Type of Test:	CU'

Minor Principal Stress σ_3 (psi)	Pore Pressure μ (psi)	Effective Minor Principal Stress σ_3' (psi)	Deviator Stress $\sigma_1-\sigma_3$ (psi)	Failure Criteria Maximum Principal Effective Stress Ratio	Axial Strain At Failure ε (%)
3.0	0.7	2.3	9.5	$(\sigma_1'/\sigma_3')_{max}$	1.7
6.0	2.6	3.4	13.3		2.1
9.0	3.7	5.3	16.5		3.1



Shear Parameters
ϕ': 32.3 deg
tan ϕ': 0.631
c': 185 psf



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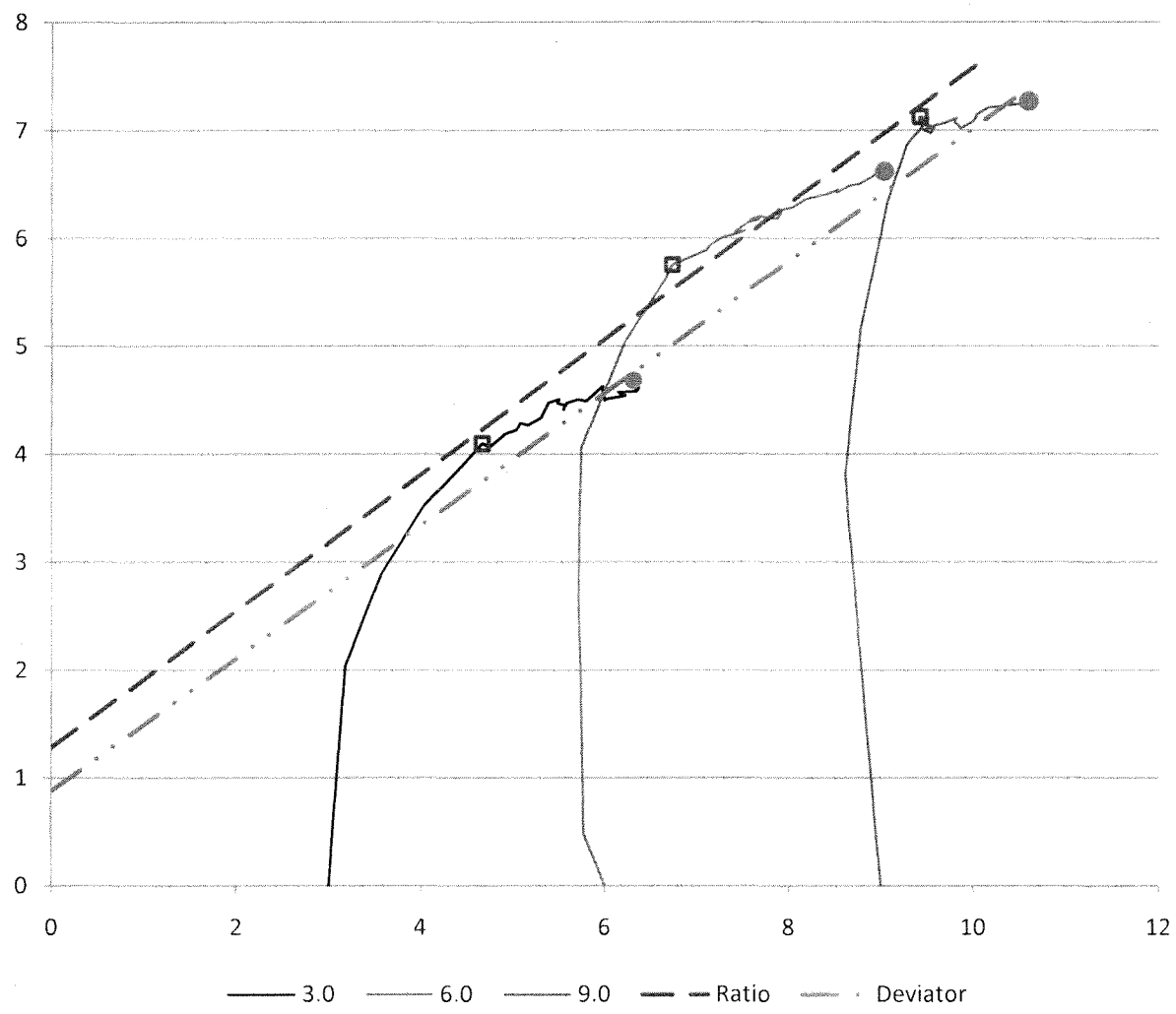
TRIAXIAL SHEAR TEST
ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-25 Depth: 6.0-6.6	Lab No.:	28875
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3 Opt. Moisture:	Classification:	CL (Alluvium)
Remarks:		Type of Test:	CU'



VECTOR DIAGRAM

Shear Parameters

Maximum Stress Ratio	Maximum Deviator Stress
ϕ': 32.3 deg	ϕ': 31.6 deg
tan ϕ': 0.631	tan ϕ': 0.615
c': 185 psf	c': 127 psf

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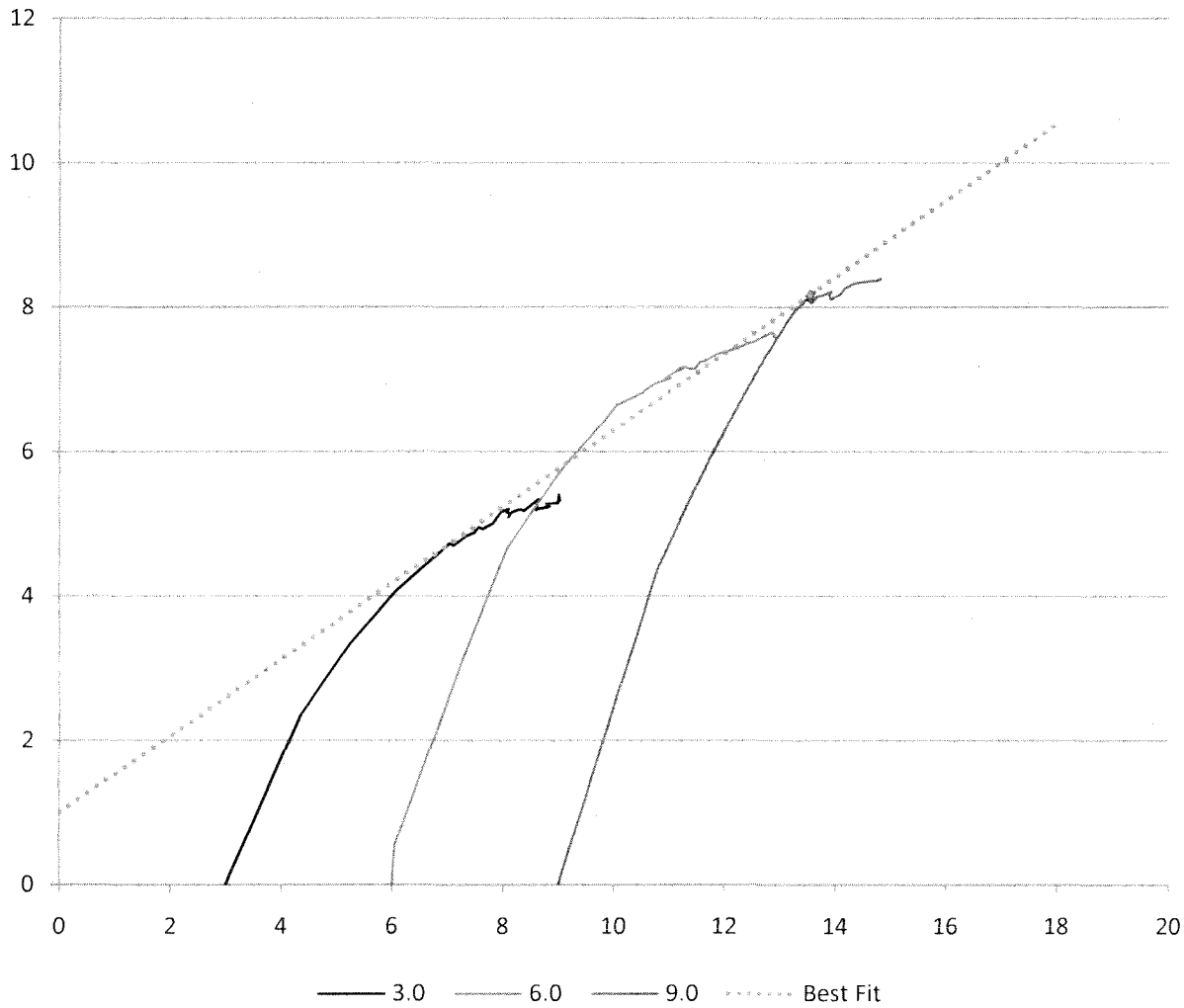
TRIAXIAL SHEAR TEST
ASTM Designation: D 2850, D 4767

Project:	West Haymarket Arena	Project No.:	00110099.00
Boring No.:	B-25 Depth: 6.0-6.6	Lab No.:	28875
Type of Specimen:	5" Shelby Tube	Humidity During Trimming:	45%
Max. Dry Density:	lb/ft^3 Opt. Moisture:	Classification:	CL (Alluvium)
Remarks:		Type of Test:	CU'



EFFECTIVE STRESS PATH PLOT

Shear Parameters for Best-Fit Line

ϕ': 32.0 deg

tan ϕ': 0.625

c': 170 psf

APPENDIX H. MOISTURE-DENSITY CURVES

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825 J Street, Box 80358
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(402)479-2200 FAX (402)479-2276

Soil Compaction Curve
STANDARD COMPACTIVE EFFORT
ASTM Designation: D 698 - 91

Job No.: 110099 Lab No. 28998 Curve No. 5870 Date 23-Dec-10

Project: Haymarket Arena

Location: B-4 0.5'-3.5'

Material: Alluvium

Classification	CL	Total Percent Retained On:	
Liquid Limit	29	No. 4 Sieve	
Plastic Limit	13	3/8-in. Sieve	
Plasticity Index	16	3/4-in. Sieve	
Specific Gravity	2.70	Oversize Fraction	%

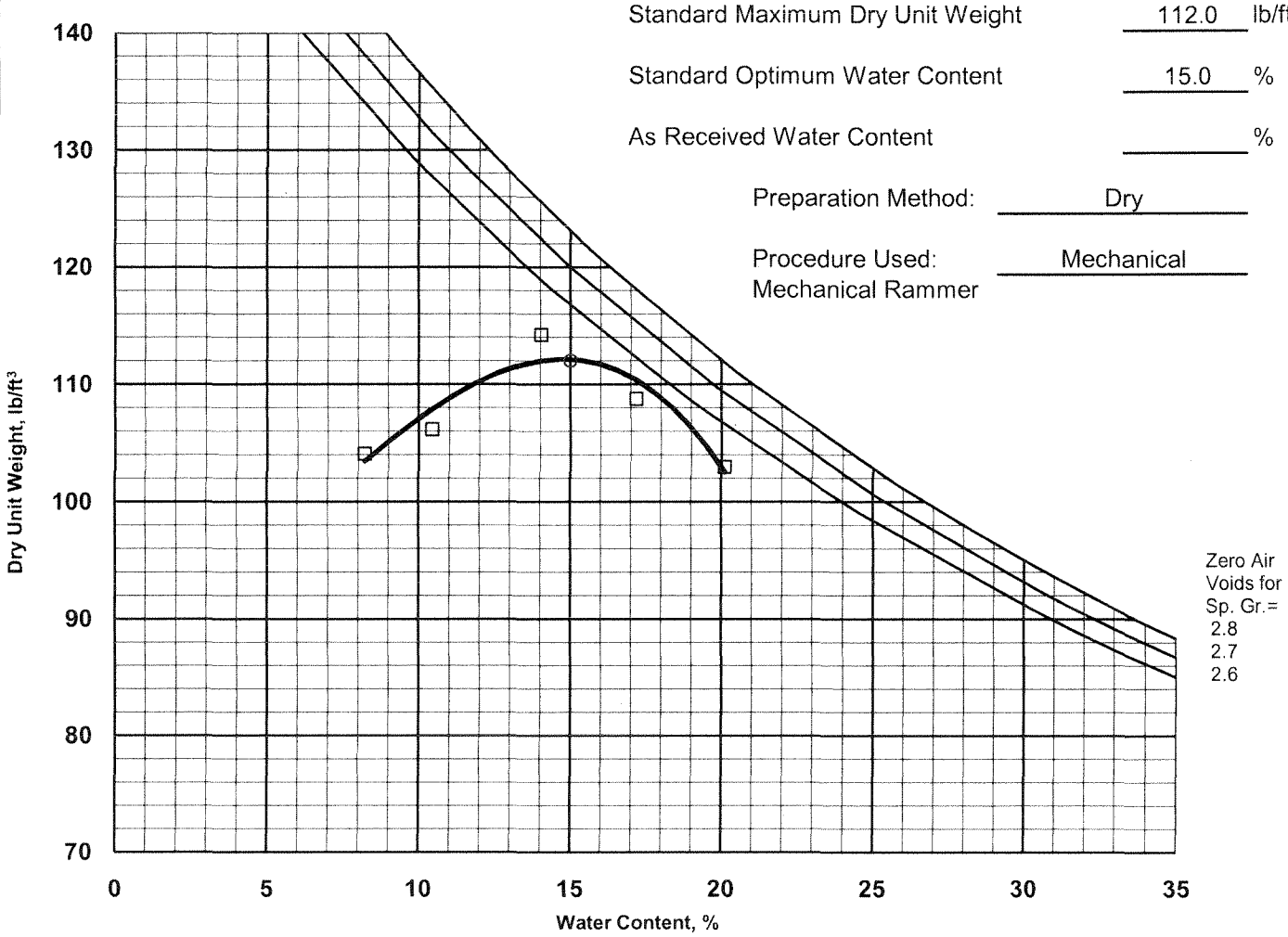
Standard Maximum Dry Unit Weight 112.0 lb/ft^3

Standard Optimum Water Content 15.0 %

As Received Water Content %

Preparation Method: Dry

Procedure Used: Mechanical
Mechanical Rammer



□ Laboratory test points ○ Computed Max. Dry Unit Weight and Optimum water content

Figure H-1

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Lincoln, NE 68501
(402)479-2200 FAX (402)479-2276

Soil Compaction Curve
STANDARD COMPACTIVE EFFORT
ASTM Designation: D 698 - 91

Job No.: 110099 Lab No. 28999 Curve No. 5871 Date 23-Dec-10

Project: Haymarket Arena

Location: B-8 2.0'-5.0'

Material: Existing Fill

Classification	CH	Total Percent Retained On:	
Liquid Limit	51	No. 4 Sieve	
Plastic Limit	22	3/8-in. Sieve	
Plasticity Index	29	3/4-in. Sieve	
Specific Gravity	2.70	Oversize Fraction	%

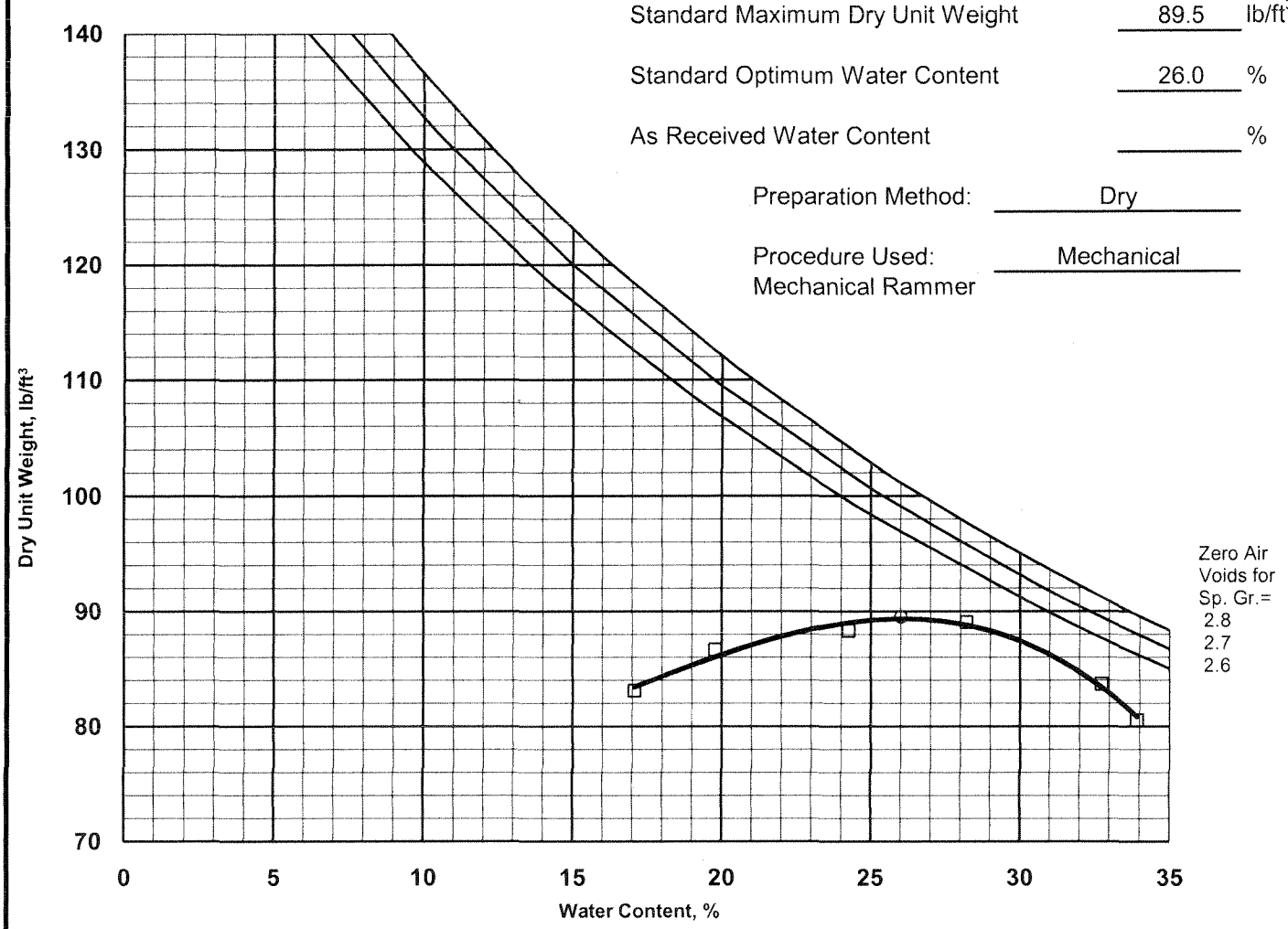
Standard Maximum Dry Unit Weight 89.5 lb/ft^3

Standard Optimum Water Content 26.0 %

As Received Water Content %

Preparation Method: Dry

Procedure Used: Mechanical
Mechanical Rammer



□ Laboratory test points ○ Computed Max. Dry Unit Weight and Optimum water content

Figure H-2

Advertise 1 time
Friday, April 1, 2011

City of Lincoln/Lancaster County
Purchasing Division
NOTICE TO BIDDERS

Sealed bids will be received by the Purchasing Agent of the City of Lincoln/Lancaster County, Nebraska **BY ELECTRONIC BID PROCESS** until: **12:00 pm, Wednesday, April 20, 2011** for the following two bids:

West Haymarket JPA
Initial Haymarket Site Preparation
Project No. 870703
Bid No. 11-079

****

West Haymarket JPA
USPS Parking Lot Reconstruction
Project 870303
Bid No. 11-080

The above two bids are tied together.

Bidders must be registered on the City/County's E-Bid site in order to respond to the above Bid. To Register go to: lincoln.ne.gov (type: e-bid - in search box, then click "Supplier Registration")

Upon e-mail notification of registration approval, you may go to the E-Bid site to respond to this bid. Questions concerning this bid process may be directed to City/County Purchasing at (402) 441-8314 or (402) 441-7410 or *vmejer@lincoln.ne.gov*

City of Lincoln/Lancaster County (Lincoln Purchasing)
Supplier Response

Bid Information

Bid Creator	Deb Winkler Systems Administrator
Email	dwinkler@lincoln.ne.gov
Phone	1 (402) 441-7410
Fax	1 (402) 441-6513
Bid Number	11-079 Addendum 5
Title	West Haymarket JPA Initial Haymarket Site Preparation Project 870703 (PW/U - Eng. Services)
Bid Type	Bid
Issue Date	04/01/2011
Close Date	4/20/2011 12:00:00 PM CST
Need by Date	

Contact Information

Address	Purchasing\City & County 440 S. 8th St. Lincoln, NE 68508
Contact	Vince M. Mejer
Department	
Building	
Floor/Room	
Telephone	(402) 441-8314
Fax	(402) 441-6513
Email	vmejer@lincoln.ne.gov

Ship to Information

Address	
Contact	
Department	
Building	
Floor/Room	
Telephone	
Fax	
Email	

Supplier Information

Company	Judds Brothers Construction Co.
Address	3835 N 68th Street Lincoln, NE 68505
Contact	
Department	
Building	
Floor/Room	
Telephone	1 (402) 467-4666
Fax	1 (402) 467-4782
Email	
Submitted	4/20/2011 11:52:34 AM CST
Total	$5,136,341.45

Signature _____

Supplier Notes

Bid Notes

Attached Addendum No. 5 and revised pricing sheet.

This bid is tied with Bid 11-080, USPS Parking Lot Reconstruction, Proj. 870303.

If you need assistance in preparing your bid, there are several options.

1) Click the "Help" button in the upper right hand corner of any screen; 2) Contact our office for a training session in Purchasing or assistance over the phone; 3) View the PowerPoint presentation at http://www.lincoln.ne.gov/city/finance/purch/spec/bidinst.ppt

Bid Messages

Please review the following and respond where necessary

#	Name	Note	Response
1	Standard Specifications for Municipal Construction	I acknowledge reading and understanding the current City of Lincoln Standard Specifications for Municipal Construction and Lincoln Standard Plans (including General Provisions and Requirements, and Material and Construction Specifications) View at: http://www.lincoln.ne.gov/city/pworks/engine/dconst/standard/stndspec/index.htm	Yes
2	NDOR Standard Specs for Hwy Construction	I acknowledge reading and understanding the current Nebraska Department of Road's Standard Specifications for Highway Construction Supplemental Specifications to the Standard Specifications for Highway Construction, view at: http://www.dor.state.ne.us/ref-man/	Yes
3	Form of Contract Agreement	I acknowledge reading and understanding the Contract Agreement Forms.	Yes
4	Form of Bonds	I acknowledge that a Performance Bond and a Payment Bond each in the amount of 100% of the Contract amount will be required with the signed contract upon award of this job.	Yes
5	Special Provisions/Traffic Control Provisions	I acknowledge reading and understanding the Special Provisions and/or Traffic Control Provisions.	Yes
6	Instructions to Bidders	I acknowledge reading and understanding the Instructions to Bidders.	Yes
7	Insurance Requirements	I acknowledge reading and understanding the Insurance Requirements.	Yes
8	Specifications	I acknowledge reading and understanding the Specifications.	Yes
9	Plan, Profile & Detail Sheets	I acknowledge reading and understanding the Plan, Profile & Detail Sheets included with this bid.	Yes
10	Tax Exempt Certificate Forms	Materials being purchased in this bid are tax exempt and unit prices are reflected as such. A Purchasing Agent Appointment form and a Exempt Sales Certificate form shall be issued with contract documents. (Note: State Tax Law does not provide for sales tax exemption for proprietary functions for government, thereby Water projects are taxable.)	Yes
11	Bid Bond Submission - City	I acknowledge and understand that my bid will not be considered unless a bid bond or certified check in the sum of five percent (5%) of the total amount of the bid is made payable to the order of the City Treasurer as a guarantee of good faith prior to the bid opening. The bid security may be scanned and attached to the 'Response Attachments' section of your response or faxed to the Purchasing Office (402)441-6513. The original bond/check must then be received in the Purchasing Office, 440 S. 8th Street, Ste. 200, Lincoln, NE 68508 within three (3) days of bid closing. YOU MUST INDICATE YOUR METHOD OF BID BOND SUBMISSION IN BOX TO RIGHT!	I have scanned and attached my bid bond.

12	Electronic Signature	Please check here for your electronic signature.	Yes
13	Contact	Name of person submitting this bid:	John R. Judds
14	Unit Pricing Rules	I acknowledge the Excel spreadsheet is attached to this bid in the Response Attachment Section. The unit price of the Excel Spreadsheet takes precedence over the total submitted in Line Items.	Yes
15	Project Dates	The Contractor agrees that the Work in this Contract shall begin as soon after the Notice to Proceed as is necessary for the Contractor to complete the Work within the number of calendar days allowed and prior to the stated completion date. The completion date shall be December 9, 2011.	YES
16	Employee Class Act EO	I acknowledge reading and understanding the Employee Classification Act, Executive Order 83319.	Yes
17	Employee Class Act Affidavit	I acknowledge if awarded the contract I will abide by the law, notorize and attach the Employee Classification Act Affidavit to my contract.	Yes
18	Davis Bacon	I acknowledge reading and understanding the Davis Bacon Wage Rates.	Yes
19	Agreement to Addendum No. 1	Respondent hereby certifies that the change set forth in this addendum has been incorporated in their proposal and is part of their bid. Reason: Attached Addendum No. 1 and Revised Pricing Sheet.	Yes
20	Agreement to Addendum No. 2	Respondent hereby certifies that the change set forth in this addendum has been incorporated in their proposal and is part of their bid. Reason: Attached Addendum No. 2.	Yes
21	Agreement to Addendum No. 3	Respondent hereby certifies that the change set forth in this addendum has been incorporated in their proposal and is part of their bid. Reason: Attached Addendum No. 3.	Yes
22	Agreement to Addendum No. 4	Respondent hereby certifies that the change set forth in this addendum has been incorporated in their proposal and is part of their bid. Reason: Attached Addendum No. 4 and revised pricing sheet.	Yes
23	Agreement to Addendum No. 5	Respondent hereby certifies that the change set forth in this addendum has been incorporated in their proposal and is part of their bid. Reason: Attached Addendum No. 4 and revised pricing sheet.	Yes

Line Items

#	Qty	UOM	Description	Response
1	1	Lump Sum	Initial Haymarket Site Preparation Project 870703 - Total Lump Sum of Bid	$5,136,341.45

Item Notes: Fill out the itemized Excel spreadsheet attached below. Attach completed spreadsheet on the 'Response Attachments' of your response.

Supplier Notes:

Response Total: $5,136,341.45

11-079

JUDDS BROTHERS CONSTRUCTION COMPANY

Line No.	Pay Item No.	Description	Quantity	Unit	Unit Price	Amount
001	00.2000	Const Staking			$11,500.00	$11,500.00
002	00.4000	Mobilization			$125,000.00	$125,000.00
003	01.0100	Pavt & Sidewalk Rem			$13.50	$12,703.50
004	01.0170	Adj MH to Grade, Cmpl			$290.00	$870.00
005	01.0210	Sawing, Type "A"			$4.50	$1,291.50
006	01.0220	Sawing, Type "B"			$4.50	$1,228.50
007	01.0230	Sawing, Type "C"			$5.50	$209.00
008	02.0010	Gen Clearing & Grubbing	1.0000	LS	$10,000.00	$10,000.00
009	02.0090	Rem & Replace Fence	150.0000	LF	$20.00	$3,000.00
010	02.0120	Parking Space Finish	968.0000	SY	$6.00	$5,808.00
011	02.0303	Over-Excavation	44,914.0000	CY	$5.40	$242,535.60
012	02.0601	Earthwork Measured in Embankment	102,426.0000	CY	$7.50	$768,195.00
013	03.0060	PCC Pavt w/Int Curb, 9"	884.0000	SY	$53.00	$46,852.00
014	03.0070	PCC Pavt w/Int Curb, 8"	11.0000	SY	$45.00	$495.00
015	03.0090	PCC Pavt w/Int Curb, 6"	183.0000	SY	$41.00	$7,503.00
016	06.0020	Combined Curb & Gutter	458.0000	LF	$20.00	$9,160.00
017	07.0020	Conc Sidewalk, 4"	4,146.0000	SF	$3.60	$14,925.60
018	07.0100	Detectable Warning Panels	50.0000	SF	$40.00	$2,000.00
019	10.0010	Crushed Rock Surfacing (In Place)	9,580.0000	TON	$28.00	$268,240.00
020	11.0700	Flowable Fill	5.0000	CY	$160.00	$800.00
021	14.0201	Rel Sign and Post	2.0000	EA	$60.00	$120.00
022	15.0001	Traffic Ctrl for Const	1.0000	LS	$7,000.00	$7,000.00
023	20.0387	Boring for 15" Sanitary Sewer Pipe	163.0000	LF	$245.00	$39,935.00
024	20.0570	RCP Storm Sewer, Cl V, JIP, 42"	208.0000	LF	$330.00	$68,640.00
025	21.0030	RCP Storm Sewer, Cl III, 60"	224.0000	LF	$185.00	$41,440.00
026	21.0040	RCP Storm Sewer, Cl III, 54"	665.0000	LF	$155.00	$103,075.00
027	21.0050	RCP Storm Sewer, Cl III, 48"	119.0000	LF	$135.00	$16,065.00
028	21.0060	RCP Storm Sewer, Cl III, 42"	92.0000	LF	$125.00	$11,500.00
029	21.0070	RCP Storm Sewer, Cl III, 36"	8.0000	LF	$80.00	$640.00
030	21.0090	RCP Storm Sewer, Cl III, 24"	124.0000	LF	$55.00	$6,820.00
031	21.0100	RCP Storm Sewer, Cl III, 18"	74.0000	LF	$45.00	$3,330.00
032	21.0110	RCP Storm Sewer, Cl III, 15"	71.0000	LF	$45.00	$3,195.00
033	21.0590	RC FES, 24"	1.0000	EA	$400.00	$400.00
034	21.0610	RC FES, 18"	3.0000	EA	$300.00	$900.00

Import / Export - OFFICE STAFF ONLY

035	21.0770	Storm Sewer Inlet (Cmpl), 72"	2.0000	EA	$2,200.00	$4,400.00
036	21.0790	Radius Storm Sewer Inlet (Cmpl), 72"	1.0000	EA	$2,200.00	$2,200.00
037	21.0830	Grate Inlet, Ty "F-2" (Cmpl)	2.0000	EA	$2,000.00	$4,000.00
038	21.0870	Storm Sewer MH, 54"-60" (Cmpl)	4.0000	EA	$5,500.00	$22,000.00
039	21.0880	Storm Sewer MH, 42"-48" (Cmpl)	1.0000	EA	$4,500.00	$4,500.00
040	21.0940	Conc for Collars, Elbows & Hdwls (In Place)	3.5200	CY	$550.00	$1,936.00
041	21.0950	Reinf Steel for Collars, Elbows & Hdwls (In Place)	379.0000	LBS	$1.00	$379.00
042	21.1270	Rem Storm Sewer Pipe, 36"	115.0000	LF	$10.00	$1,150.00
043	21.1290	Rem Storm Sewer Pipe, 24"	57.0000	LF	$8.00	$456.00
044	21.1310	Rem Storm Sewer Pipe, 18"	113.0000	LF	$6.00	$678.00
045	21.1320	Rem Storm Sewer Pipe, 15"	71.0000	LF	$6.00	$426.00
046	21.1325	Rem Storm Sewer Pipe, 12"	47.0000	LF	$6.00	$282.00
047	21.1590	Rem RC FES, 60"	1.0000	EA	$650.00	$650.00
048	21.1700	Rem Storm Sewer MH (Cmpl)	2.0000	EA	$550.00	$1,100.00
049	21.1710	Rem Ex Inlet (Cmpl)	1.0000	EA	$350.00	$350.00
050	21.1740	Rem Ex Grate Inlet (Cmpl)	2.0000	EA	$350.00	$700.00
051	21.2090	Geotextile Filter Fabric (In Place)	8,756.0000	SY	$2.00	$17,512.00
052	22.0050	Sanitary Sewer Pipe, 15"	696.0000	LF	$70.00	$48,720.00
053	22.0060	Sanitary Sewer Pipe, 12"	417.0000	LF	$65.00	$27,105.00
054	22.0070	Sanitary Sewer Pipe, 10"	20.0000	LF	$60.00	$1,200.00
055	22.0660	Std MH, Ty "P"	2.0000	EA	$4,200.00	$8,400.00
056	22.0670	Std MH, Ty "P" 2	30.7000	VF	$185.00	$5,679.50
057	22.0680	Std MH, Ty "Q"	1.0000	EA	$4,200.00	$4,200.00
058	22.0690	Std MH, Ty "Q" 2	16.6000	VF	$185.00	$3,071.00
059	22.0720	Std MH, Ty "R"	1.0000	EA	$4,100.00	$4,100.00
060	22.0730	Std MH, Ty "R" 2	15.6000	VF	$100.00	$1,560.00
061	22.0740	Conc for Plugs & Collars (In Place)	0.0500	CY	$220.00	$11.00
062	22.0760	Tap Ex MH & Reconst Invert	2.0000	EA	$1,000.00	$2,000.00
063	22.0780	Rem Sanitary Sewer MH (Cmpl)	5.0000	EA	$1,000.00	$5,000.00
064	23.0006	Water Main, 12"	602.0000	LF	$45.00	$27,090.00
065	23.0007	Water Main, 8"	397.0000	LF	$35.00	$13,895.00
066	23.0008	Water Main, 6"	50.0000	LF	$30.00	$1,500.00
067	23.0290	Tapping Sleeve & Valve, MJ, 12" x 4"	1.0000	EA	$4,200.00	$4,200.00
068	23.0440	Gate Valve, MJ, 12"	4.0000	EA	$1,600.00	$6,400.00
069	23.0460	Gate Valve, MJ, 6"	4.0000	EA	$600.00	$2,400.00
070	23.0490	Hydrant, Cmpl L=5.5"	5.0000	LF	$2,000.00	$10,000.00
071	23.0510	Retainer Glands, MJ, 12"	38.0000	EA	$80.00	$3,040.00
072	23.0520	Retainer Glands, MJ, 8"	6.0000	EA	$40.00	$240.00
073	23.0530	Retainer Glands, MJ, 6"	15.0000	EA	$30.00	$450.00
074	23.0531	Retainer Glands, MJ, 4"	5.0000	EA	$25.00	$125.00
075	23.0536	Deg Bend, MJ, 12" X 90	1.0000	EA	$250.00	$250.00
076	23.0544	Deg Bend, MJ, 12" X 45	4.0000	EA	$220.00	$880.00
077	23.0546	Deg Bend, MJ, 6" X 45	3.0000	EA	$90.00	$270.00

078	23.0552	Deg Bend, MJ, 12" X 22.5	2.0000	EA	$200.00	$400.00
079	23.0554	Deg Bend, MJ, 6" X 22.5	1.0000	EA	$80.00	$80.00
080	23.0578	Tee, MJ, 12" X 12"	1.0000	EA	$360.00	$360.00
081	23.0580	Tee, MJ, 12" X 6"	3.0000	EA	$260.00	$780.00
082	23.0581	Tee, MJ, 8" X 8"	1.0000	EA	$190.00	$190.00
083	23.0592	Anchoring Elbow, MJ, 6"	2.0000	EA	$130.00	$260.00
084	23.0594	Anchoring Coupling, MJ (L=18"), 6"	3.0000	EA	$120.00	$360.00
085	23.0621	Reducer, MJ, 12" X 8"	1.0000	EA	$140.00	$140.00
086	23.0623	Reducer, MJ, 8" X 6"	2.0000	EA	$90.00	$180.00
087	23.0648	Solid Sleeve, MJ (L=12"), 12"	3.0000	EA	$200.00	$600.00
088	23.0665	Conc for Thrust Blocks & Anchorages (In Place)	9.7000	CY	$300.00	$2,910.00
089	23.0670	Reinf Stl for Thrust Blks & Anchorages	291.1000	LBS	$1.00	$291.10
090	23.0685	Reconstruct Water Service	1.0000	EA	$600.00	$600.00
091	23.0930	Rem 12" Water Main	80.0000	LF	$16.00	$1,280.00
092	23.0950	Rem 6" Water Main	223.0000	LF	$16.00	$3,568.00
093	23.0955	Rem 4" Water Main	62.0000	LF	$16.00	$992.00
094	23.0960	Rem & Salvage Hydrant (Cmpl)	1.0000	EA	$330.00	$330.00
095	30.0050	Seeding, Ty "B"	0.2000	AC	$3,200.00	$640.00
096	32.0040	Synthetic Fabric Silt Fence Inst	5,659.0000	LF	$2.25	$12,732.75
097	32.0050	Synthetic Fabric Silt Fence Maint	11,318.0000	LF	$0.30	$3,395.40
098	32.0070	Inst Storm Drain Inlet Protection	8.0000	EA	$90.00	$720.00
099	32.0080	Storm Drain Inlet Protection Maint	16.0000	EA	$30.00	$480.00
100	32.0090	Rem Storm Drain Inlet Protection	8.0000	EA	$5.50	$44.00
101	32.0100	Silt Fence Culvert Inlet Protection	120.0000	LF	$3.50	$420.00
102	32.0110	Silt Fence Culvert Inlet Protection Maint	240.0000	LF	$1.00	$240.00
103	32.0120	Silt Fence Culvert Inlet Protection Rem	120.0000	LF	$1.00	$120.00
104	50.0001	Removal of Building at Sta. 2101+06.31	1.0000	EA	$13,500.00	$13,500.00
105	50.0001	Removal of Building at Sta. 2103+94.09	1.0000	EA	$23,400.00	$23,400.00
106	50.0001	Abandon Well	11.0000	EA	$550.00	$6,050.00
107	50.0001	Remove Post	5.0000	EA	$55.00	$275.00
108	50.0001	Reconstruct Sanitary Sewer Manhole at Sta. 2098+38.31	1.0000	EA	$1,600.00	$1,600.00
109	50.0001	Reconstruct Sanitary Sewer Manhole at Sta. 2100+99.46	1.0000	EA	$1,600.00	$1,600.00
110	50.0001	Reconstruct Sanitary Sewer Manhole at Sta. 2103+54.57	1.0000	EA	$1,600.00	$1,600.00
111	50.0001	Horizontal Sliding Gate	2.0000	EA	$3,000.00	$6,000.00
112	50.0001	24"-0" Wide Double Swing Gate	1.0000	EA	$1,500.00	$1,500.00
113	50.0001	Parking Meter Post	6.0000	EA	$300.00	$1,800.00
114	50.0001	Settlement Plate	21.0000	EA	$400.00	$8,400.00
115	50.0001	Furnish Dewatering Container	4.0000	EA	$4,200.00	$16,800.00
116	50.0001	Special Storm Sewer Manhole at Sta. 1305+52.83	1.0000	EA	$17,000.00	$17,000.00
117	50.0001	Special Storm Sewer Manhole at Sta. 1307+07.33	1.0000	EA	$11,500.00	$11,500.00
118	50.0001	Pothole Existing Sanitary Sewer Pipe	1.0000	EA	$2,000.00	$2,000.00
119	50.0001	Solid Sleeve, MJ (L=12"), 4"	1.0000	EA	$60.00	$60.00
120	50.0001	Degree Bend, M.J., 4" X 22.5	1.0000	EA	$60.00	$60.00

121	50.0001	Remove & Salvage Gate or Butterfly Valve & Box (Complete)	4.0000	EA	$150.00	$600.00
122	50.0001	Remove & Salvage Tapping Sleeve & Valve (Complete)	2.0000	EA	$650.00	$1,300.00
123	50.0001	Pothole Water Service	1.0000	EA	$900.00	$900.00
124	50.0001	18" Hydrant Extension, Complete	1.0000	EA	$400.00	$400.00
125	50.0005	Remove Guardrail	29.0000	LF	$10.00	$290.00
126	50.0005	Remove Retaining Wall	56.0000	LF	$20.00	$1,120.00
127	50.0005	Remove Platform	381.0000	LF	$35.00	$13,335.00
128	50.0005	96" Chain Link Fence (In Place)	5,146.0000	LF	$14.00	$72,044.00
129	50.0005	24" R.C.P. Storm Sewer, CL V, J.I.P.	118.0000	LF	$215.00	$25,370.00
130	50.0005	Remove C.M.P. Storm Sewer Pipe, 36"	13.0000	LF	$9.00	$117.00
131	50.0005	24" C.M.P. Storm Sewer	115.0000	LF	$50.00	$5,750.00
132	50.0005	36" C.M.P. Storm Sewer	13.0000	LF	$70.00	$910.00
133	50.0005	15" CMP Storm Sewer	183.0000	LF	$45.00	$8,235.00
134	50.0005	Dewatering for Storm Sewers	374.0000	LF	$15.00	$5,610.00
135	50.0005	Dewatering For Sanitary Sewers	926.0000	LF	$15.00	$13,890.00
136	50.0005	Remove Sanitary Sewer Pipe	1,282.0000	LF	$30.00	$38,460.00
137	50.0005	Horizontal Directionally Drilled for 6" Water Main	194.0000	LF	$65.00	$12,610.00
138	50.0005	Smooth Steel Casing, Bored in Place, 24"	87.0000	LF	$285.00	$24,795.00
139	50.0005	Water Main, 4"	92.0000	LF	$35.00	$3,220.00
140	50.0005	Dewatering for Water Mains	220.0000	LF	$15.00	$3,300.00
141	50.0010	Stockpile Soils Reused in Embankment	76,000.0000	CY	$6.25	$475,000.00
142	50.0010	Surcharge Embankment	71,085.0000	CY	$7.00	$497,595.00
143	50.0010	Surcharge Removal and Reuse in Phase II Embankment	71,085.0000	CY	$2.25	$159,941.25
144	50.0010	Excavation for Benefical Reuse Soils	44,283.0000	CY	$12.00	$531,396.00
145	50.0010	Stockpiled Soils for Beneficial Reuse	18,500.0000	CY	$8.00	$148,000.00
146	50.0015	Reconstruct 7th Street Irrigation System	1.0000	LS	$1,400.00	$1,400.00
147	50.0015	Temporary Shoring Sta. 4000+50.00 to Sta. 4002+29.59	1.0000	LS	$70,000.00	$70,000.00
148	50.0015	Temporary Shoring Sta. 4007+29.15 to Sta. 4009+67.34	1.0000	LS	$70,000.00	$70,000.00
149	50.0015	Bypass Pumping at Sta. 4005+20.51	1.0000	LS	$3,500.00	$3,500.00
150	50.0015	Bypass Pumping at Sta. 4009+50.70	1.0000	LS	$3,500.00	$3,500.00
151	50.0015	Temporary Shoring at Sta. 14+43.00	1.0000	LS	$13,500.00	$13,500.00
152	50.0015	Abandonment of Water Main (In Place)	1.0000	LS	$3,000.00	$3,000.00
153	50.0015	Remove Water Meter Vault, Complete	1.0000	LS	$3,500.00	$3,500.00
154	50.0015	GPS Information for Water Main Construction	1.0000	LS	$1,200.00	$1,200.00
155	50.0015	Sediment Basin "A"	1.0000	LS	$15,000.00	$15,000.00
156	50.0015	Sediment Basin "B"	1.0000	LS	$3,750.00	$3,750.00
157	50.0015	Sediment Basin "C"	1.0000	LS	$6,000.00	$6,000.00
158	50.0020	Cover Crop Seeding	10.1300	AC	$850.00	$8,610.50
159	50.0035	Stockpiled Soils, Construction and Demolition Waste	850.0000	TON	$19.00	$16,150.00
160	50.0035	Excavation of Construction and Demolition Waste	1,700.0000	TON	$20.00	$34,000.00
161	50.0010	Grading & Placement of Beneficial Reuse Soils	62,783.0000	CY	$1.25	$78,478.75
162	50.0035	Disposal of Petroleum Contaminated Soils	1,000.0000	TON	$60.00	$60,000.00
163	50.0035	Granular Material for Subgrade Stabilization	8,550.0000	TON	$30.00	$256,500.00

164	50.0035	A.C. Surface Course, Type 2P	330.0000	TON	$70.00	$23,100.00
165	50.0040	Hard Surfacing For Access Roads	2,228.0000	SY	$33.00	$73,524.00
166	50.0040	Temporary Surfacing	576.0000	SY	$25.00	$14,400.00
167	50.0040	Geotextile for Subgrade Stabilization	7,390.0000	SY	$4.00	$29,560.00
168	50.0040	Erosion Control Blanket, Type 1	6,767.0000	SY	$1.00	$6,767.00
169	50.0045	Remove & Salvage Brick Pavers	559.0000	SF	$3.25	$1,816.75
170	50.0050	Construction Staking for Utilities	12.0000	HRS	$130.00	$1,560.00
171	50.0060	Dewatering Container Usage	600.0000	CDAY	$65.00	$39,000.00
172	50.0060	Dewatering for Over-Excavation Work	75.0000	CDAY	$180.00	$13,500.00
						$5,120,645.70

WEST HAYMARKET JOINT PUBLIC AGENCY(JPA)

INITIAL HAYMARKET SITE PREPARATION
11-079
PROJECT 870703

CONTRACT AGREEMENT

THIS CONTRACT, made and entered into this 25 day of APRIL, 2011 by and

between JUDDS BROTHERS CONSTRUCTION CO.

hereinafter called the Contractor and the WEST HAYMARKET JOINT PUBLIC AGENCY, a **municipal corporation**, hereinafter called JPA.

WITNESS, that:

WHEREAS, JPA has caused to be prepared, in accordance with law, Specifications, Plans, and other Contract Documents for the Work herein described, and has approved and adopted said documents and has caused to be published an advertisement for and in connection with said Work, to wit:

INITIAL HAYMARKET SITE PREPARATION PROJECT 870703 ; and

WHEREAS, the Contractor, in response to such advertisement, has submitted to the JPA, in the manner and at the time specified, a sealed Proposal in accordance with the terms of said advertisement; and,

WHEREAS, JPA, in the manner prescribed by law, has publicly advertised, opened, examined, and canvassed the Proposals submitted in response to such advertisement, and as a result of such canvass has determined and declared the Contractor to be the lowest and best bidder for the said Work for the sum or sums named in the Contractor's Proposal, a copy thereof being attached to and made a part of this Contract.

NOW, THEREFORE, in consideration of the sums to be paid to the Contractor and the agreements herein contained, the Contractor and JPA have agreed and hereby agree as follows:

CONTRACT AGREEMENT

The Contractor agrees to (a) furnish all tools, equipment, supplies, superintendence, transportation, and other construction accessories, services, and facilities; (b) furnish all materials, supplies, and equipment specified to be incorporated into and form a permanent part of the complete Work; (c) provide and perform all necessary labor in a substantial and workmanlike manner and in accordance with the provisions of the Contract Documents; and (d) execute, construct, and complete all Work included in and covered by JPA's official award of this Contract to the Contractor, such award being based on the acceptance by JPA of the Contractor's Proposal, or part thereto, as follows:

ALL OF THE PROPOSAL SUBMITTED BY JUDDS BROTHERS CONSTRUCTION CO IN CONNECTION WITH THE WEST HAYMARKET JPA INITIAL HAYMARKET SITE PREPARATION PROJECT 870703 DATED APRIL 20, 2011

JPA agrees to pay to the Contractor for the performance of the work embraced in this Contract, and the Contractor agrees to accept as full compensation therefore, the sums and prices for all Work covered by and included in the Contract award and designated above, payment thereof to be made in the manner provided in the General Provisions and Requirements.

COMPLETION DATE – The Contractor agrees that the Work in this Contract shall begin as soon after the Notice to Proceed as is necessary for the Contractor to complete the Work within the number of calendar days allowed and prior to the stated completion date. The completion date shall be no later than DECEMBER 9, 2011.

GUARANTEE – The guarantee periods as stated in Section IX, Paragraph A of the City of Lincoln Standard Specifications for Municipal Construction shall not be applicable to this project.

CONTRACT DOCUMENTS – The Contract Documents comprise the Contract, and consist of the following:

1. City of Lincoln Standard Specifications for Municipal Construction (2006 Edition)
2. Proposal Forms
3. Contract Agreement Forms
4. Commentary to Accompany Construction Bonds
5. Construction Performance Bond
6. Construction Payment Bond
7. Special Provisions
8. Lincoln Standard Plans 2010
9. Standard Specifications for Highway Construction Nebraska Department of Roads (2007 Edition)
10. Plan and Profile Detail Sheets
11. Any executed Addenda or Change Orders
12. Any portion of this project used for **providing water service**, such as pipe for water mains, **are not tax exempt and are subject to sales and use tax**.
13. The **remainder** of this project, including items exclusively used for providing fire protection, such as fire hydrants, **are exempt from sales and use taxes**.
14. Sales tax exempt forms will be provided upon award of bid.

CONTRACT AGREEMENT

These Contract Agreements, together with the other Contract Documents herein above mentioned, form this Contract, and they are as fully a part of the Contract as if hereto attached or herein repeated.

The Contractor and JPA hereby agree that all the terms and conditions of this Contract shall, by these presents, be binding upon themselves, and their heirs, administrators, executors, legal and personal representatives, successors, and assigns.

IN WITNESS WHEREOF, the Contractor and JPA do hereby execute this Contract.

EXECUTION BY JPA

ATTEST:

BY: _____

_____ (Seal) JPA CHAIR

JPA

Dated: _____

JOINT PUBLIC AGENCY

EXECUTION BY CONTRACTOR

IF A CORPORATION

_____
(Name of Corporation)

ATTEST:

_____
(Address)

_____ (Seal)

By: _____
(Duly Authorized Official)

_____
(Legal Title of Official)

IF OTHER TYPE ORGANIZATION

_____
(Name and Type of Organization)

_____
(Address)

_____
(Member)

_____
(Member)

_____
(Member)

IF AN INDIVIDUAL

By: _____
(Name)

_____

Commentary to Accompany Construction Bonds

A. GENERAL INFORMATION

There are two types of construction bonds that are required by statutes for public work in many jurisdictions and are widely used for other projects as well.

- Construction Performance Bond
- Construction Payment Bond

The Construction Performance Bond is an instrument that is used to assure the availability of funds to complete the construction.

The Construction Payment Bond is an instrument that is used to assure the availability of sufficient funds to pay for labor, materials and equipment used in the construction. For public work the Construction Payment Bond provides rights of recovery for workers and suppliers similar to their rights under the mechanics lien laws applying to private work.

The objective underlying the rewriting of construction bond forms was to make them more understandable and to provide guidance to users. The intention was to define the rights and responsibilities of the parties, without changing the traditional rights and responsibilities that have been decided by the courts. The new bond forms provide helpful guidance regarding time periods for various notices and actions and clarify the extent of available remedies.

The concept of a pre-default meeting has been incorporated into the Construction Performance Bond. All of the participants favored early and informal resolution of the problems that may precipitate a default, but some Surety companies were reluctant to participate in pre-default meetings absent specific authorization in the bond form.

The responsibilities of the Owner and the options available to the Surety when a default occurs are set forth in the Construction Performance Bond. Procedures for making a claim under the Construction Payment Bond are set forth in the form.

EJCDC recommends the use of two separate bonds rather than a combined form. Normally the amount of each bond is 100 percent of the contract amount. The bonds have different purposes and are separate and distinct obligations of the Surety. The Surety Association reports that the usual practice is to charge a single premium for both bonds, and there is no reduction in premium for using a combined form or for issuing one bond without the other.

B. COMPLETING THE FORMS

Bonds have important legal consequences; consultation with an attorney and a bond specialist is encouraged with respect to federal, state, and local laws applicable to bonds and with respect to completing or modifying the bond forms.

Both bond forms have a similar format and the information to be filled in is ordinarily the same on both bonds. If modification is necessary, the modifications may be different.

The bond forms are prepared for execution by the Contractor and the Surety. Evidence of authority to bind the Surety is usually provided in the form of a power of attorney designating the agent who is authorized to sign on behalf of the Surety. The power of attorney should be filed with the signed bonds.

Each bond must be executed separately since they cover separate and distinct obligations.

Preferably the bond date should be the same date as the contract, but in no case should the bond date precede the date of contract.

Project Name: Project No.:

Bond No.: _____

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, The City of Lincoln, Nebraska ("The City") has awarded to _____ _____ as Principal a contract dated the _____ day of _____, 20____, (the "Contract"), which Contract is by this reference made a part hereof, for the work described as follows:

AND WHEREAS, Principal is required to furnish a bond in connection with the Contract, guaranteeing the faithful performance thereof;

NOW, THEREFORE, we, the undersigned Principal and _____, as Surety, are held and firmly bound unto The City in the sum of _____ dollars ($_____), to be paid to The City or its successory and assigns; for which payment, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its heirs, executors, administrators, successors, or assigns approved by The City, shall promptly and faithfully perform the covenants, conditions, and agreements of the Contract during the original term and any extensions thereof as may be granted by The City, with or without notice to Surety, and during the period of any guarantees or warranties required under the Contract, and shall also promptly and faithfully perform all the covenants, conditions, and agreements of any alteration of the Contract made as therein provided, notice of which alterations to Surety being hereby waived, on Principal's part to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify, defend, protect, and hold harmless The City as stipulated in the Contract, then this obligation shall become and be null and void; otherwise it shall be and remain in full force and effect.

No extension of time, change, alteration, modification, or addition to the Contract, or of the work required thereunder, shall release or exonerate Surety on this bond or in any way affect the obligation of this bond; and Surety does hereby waive notice of any such extension of time, change, alteration, modification, or addition.

Whenever Principal shall be and declared by The City to be in default under the Contract, Surety shall promptly remedy the default, or shall promptly:

1. Undertake through its agents or independent contractors, reasonably acceptable to The City, to complete the Contract in accordance with its terms and conditions and to pay and perform all obligations of Principal under the Contract, including without limitation, all obligations with respect to warranties, guarantees, and the payment of liquidated damages, or, at Surety's election, or, if required by The City,

Project Name: Project No.:

2. Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and, upon determination by The City of the lowest responsible bidder, arrange for a contract between such bidder and The City and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Sum, and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees, and the payment of liquidated damages; but, in any event, Surety's total obligations hereunder shall not exceed the amount set forth in the third paragraph hereof. The term "balance of the Contract Sum," as used in this paragraph, shall mean the total amount payable by The City to the Principal under the Contract and any amendments thereto, less the amount paid by The City to Principal.

Surety's obligations hereunder are independent of the obligations of any other surety for the performance of the Contract, and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing The City's rights against the others.

No right of action shall accrue on this bond to or for the use of any person or corporation other than The City or its successors or assigns.

Surety may join in any arbitration proceedings brought under the Contract and shall be bound by any arbitration award.

In the event suit is brought upon this bond by The City, Surety shall pay reasonable attorney's fees and costs incurred by The City in such suit.

Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.

IN WITNESS WHEREOF, we have hereunto set our hands this _____ day of _____, 20__.

Principal: _____
(Name of Firm)

By: _____
(Signature)

_____
(Printed Name)

Title: _____

Surety: _____
(Name of Firm)

By: _____
(Signature)

_____
(Printed Name)

Title: _____

Address for Notices:

_____

_____

_____

NOTE: Notary acknowledgment for Surety and Surety's Power of Attorney must be attached.

Project Name: Project No.:

Bond No.: _____

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, The City of Lincoln, Nebraska ("The City") has awarded to _____ _____ as Principal a contract dated the _____ day of _____, 20____, (the "Contract") for the work described as follows:

AND WHEREAS, Principal is required to furnish a bond in connection with the Contract to secure the payment of claims of laborers, mechanics, material suppliers, and other persons as provided by law;

NOW, THEREFORE, we, the undersigned Principal and _____, as Surety, are held and firmly bound unto The City in the sum of _____ dollars ($_____), for which payment well and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its heirs, executors, administrators, successors, or assigns approved by The City, or its subcontractors shall fail to pay any of the persons named in the City Charter or state statutes, or amounts due with respect to work or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over to the State of Nebraska from the wages of employees of Principal and subcontractors with respect to such work and labor, that Surety will pay for the same in an amount not exceeding the sum specified in this bond, otherwise the above obligation shall become and be null and void.

Surety, for value received, hereby expressly agrees that no extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder, shall in any way affect the obligation of this bond; and it does hereby waive notice of any such extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder.

Surety's obligations hereunder are independent of the obligations of any other surety for the payment of claims of laborers, mechanics, material suppliers, and other persons in connection with the Contract; and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing The City's rights against the other.

Project Name: Project No.:

In the event suit is brought upon this bond, the parties not prevailing in such suit shall pay reasonable attorneys' fees and costs incurred by the prevailing parties in such suit.

Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.

IN WITNESS WHEREOF, we have hereunto set our hands this _____ day of _____, 20___.

Principal: _____
(Name of Firm)

By: _____
(Signature)

_____
(Printed Name)

Title: _____

Surety: _____
(Name of Firm)

By: _____
(Signature)

_____
(Printed Name)

Title: _____

Address for Notices:

_____

_____

_____

NOTE: Notary acknowledgment for Surety and Surety's Power of Attorney must be attached.

EMPLOYEE CLASSIFICATION ACT AFFIDAVIT

For the purposes of complying with THE NEBRASKA EMPLOYEE CLASSIFICATION ACT, I, _____, herein below known as the Contractor, state under oath and swear as follows:

1. Each individual performing services for the Contractor is properly classified under the Employee Classification Act.

2.The Contractor has completed a federal I-9 immigration form and has such form on file for each employee performing services.

3. The Contractor has complied with Neb Rev Stat 4-114.

4. The Contractor has no reasonable basis to believe that any individual performing services for the Contractor is an undocumented worker.

5. The Contractor is not barred from contracting with the state or any political subdivision pursuant to section 12 of this Act.

6. As the Contractor I understand that pursuant to the Employee Classification Act a violation of the Act by a contractor is grounds for rescission of the contract by the City. I understand that pursuant to the Act any contractor who knowingly provides a false affidavit may be subject to criminal penalties and upon a second or subsequent violation shall be barred from contracting with the City for a period of three years after the date of discovery of the falsehood.

I hereby affirm and swear that the statements and information provided on this affidavit are true, complete and accurate. The undersigned person does hereby agree and represent that he or she is legally capable to sign this affidavit and to lawfully bind the Contractor to this affidavit.

PRINT NAME: _____
(First, Middle, Last)

SIGNATURE: _____

TITLE: _____

State of Nebraska)
) ss.
County of _____)

This affidavit was signed and sworn to before me, the undersigned Notary Public, on this ____ day of _____, 20__.

_____
Notary Public

General Decision Number: NE100002 10/29/2010 NE2

Superseded General Decision Number: NE20080002

State: Nebraska

Construction Types: Heavy and Highway

Counties: Adams, Antelope, Arthur, Banner, Blaine, Boone, Box Butte, Boyd, Brown, Buffalo, Burt, Butler, Cedar, Chase, Cherry, Cheyenne, Clay, Colfax, Cuming, Custer, Dakota, Dawes, Dawson, Deuel, Dixon, Dodge, Dundy, Fillmore, Franklin, Frontier, Furnas, Gage, Garden, Garfield, Gosper, Grant, Greeley, Hall, Hamilton, Harlan, Hayes, Hitchcock, Holt, Hooker, Howard, Jefferson, Johnson, Kearney, Keith, Keya Paha, Kimball, Knox, Lancaster, Lincoln, Logan, Loup, Madison, McPherson, Merrick, Morrill, Nance, Nemaha, Nuckolls, Otoe, Pawnee, Perkins, Phelps, Pierce, Platte, Polk, Red Willow, Richardson, Rock, Saline, Scotts Bluff, Seward, Sheridan, Sherman, Sioux, Stanton, Thayer, Thomas, Thurston, Valley, Wayne, Webster, Wheeler and York Counties in Nebraska.

HEAVY CONSTRUCTION PROJECTS (does not include water well drilling); HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects, and railroad construction; bascule, suspension & spandrel arch bridges; bridges designed for commercial navigation; bridges involving marine construction; other major bridges).

Modification Number	Publication Date
0	03/12/2010
1	10/29/2010

SUNE1999-001 06/16/1999

	Rates	Fringes
CARPENTER	$ 13.30	
CEMENT FINISHER	$ 12.50	
ELECTRICIAN	$ 11.90	
Flagger	$ 7.60	
Form Setter	$ 10.80	
LABORER	$ 8.30	
MANHOLE BUILDER	$ 10.20	
MECHANIC	$ 12.95	
PAINTER	$ 8.35	
Pile driver lead person	$ 8.35	
Power equipment operators:		
All purpose spreader	$ 9.50	
Asphalt distributor	$ 9.65	
Asphalt paving machine (screed)	$ 10.45	

Asphalt paving machine.....$ 12.35
Asphalt roller, self-
propelled.....$ 11.20
Backhoe excavator (track
type).....$ 12.55
Bulldozer or push tractors:
115 drawbar h.p. and over..$ 12.80
Less than 115 drawbar h.p..$ 11.60
Clamshell, dragline,
crane, pile driver/shovel...$ 13.60
Concrete cure machine.....$ 9.20
Concrete finishing machine
or slip form paver.....$ 12.80
Concrete saw operator.....$ 11.20
Concrete texture machine....$ 9.20
Crusher (including those
with integral screening
plant).....$ 11.75
Dredge pump.....$ 9.50
Front end loaders:
4 cu. yds. or less.....$ 11.40
Over 4 cu. yds.....$ 12.10
Hydrohammer.....$ 9.60
Loader/backhoe (rubber-
tired).....$ 9.85
Material stockpiler.....$ 10.20
Motor grader (finisher).....$ 13.15
Motor grader (rough).....$ 10.90
Power broom operator.....$ 9.15
Power grader machine
(trimmer & profiler).....$ 12.80
Roller or compactor,
earthwork, self-
propelled.....$ 10.05
Scraper.....$ 12.40
Skid steer loader.....$ 9.50
Stationary plant (asphalt
or concrete).....$ 12.75
Stationary plant (base or
stabili- zation).....$ 11.75
Tractor (farm type).....$ 9.50
Traveling plant
stabilization.....$ 11.60
Trenching machine.....$ 9.85
Water tankers:
6000 gallons and over.....$ 11.20
Under 6000 gallons.....$ 9.65

Truck drivers:
Semi-trailer or lowboy.....$ 10.85
Single axle.....$ 8.40
Tandem axle.....$ 9.65
Transit mix.....$ 9.65

WELDER.....$ 12.25

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.
==========

Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses

(29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

==========

END OF GENERAL DECISION

WH 11-35 Introduce: 5-5-11

RESOLUTION NO. WH- _____

BE IT RESOLVED by the Board of Representatives of the West Haymarket Joint Public Agency:

That Amendment No. 4 to the Agreement for Engineering Services with Olsson Associates for the Haymarket Infrastructure Design Project for completion of the work associated with additional services for the 10th and Salt Creek Roadway Improvement Project; additional services for the design work on the M and N Street Project; final design for ITS Components and Dynamic Message Signs; preliminary design for the future Parking Garage No. 2; construction phase services for the Initial Haymarket Site Preparation Project and the USPS Parking Lot Reconstruction Project; and traffic analysis and conceptual design work at 1st and Cornhusker and at Sun Valley and West O Street; is hereby accepted and approved and the Chairperson of the West Haymarket Joint Public Agency Board of Representatives is hereby authorized to execute said Amendment No. 4 on behalf of the West Haymarket Joint Public Agency.

The total estimated fee for the work associated with this Amendment No. 4 is $1,825,047.00, which increases the total not-to-exceed contract amount from $7,500,379.00 to $9,325,426.00.

Adopted this _____ day of _____, 2011.

Introduced by:

_____

WH 11-35

MOTION TO AMEND NO. 1

I hereby move to amend Bill No. WH 11-35 in the following manner:

1. On lines 6 and 7, delete the following language: "final design for ITS Components and Dynamic Message Signs;"

2. Remove all of Appendix A-13 from the documents attached to this resolution as Amendment No. 4.

Introduced by:

_____

Approved as to Form & Legality:

_____
City Attorney

Requested by: Jim Martin

Reason for Request: To temporarily remove the ITS and Dynamic Message Signs from the scope of services.

Approved as to Form & Legality:

_____

Legal Counsel for
West Haymarket Joint Public Agency

West Haymarket Joint Public Agency
Board of Representatives

_____

Jayne Snyder, Chair

_____

Tim Clare

_____

Chris Beutler

AMENDMENT NO. 4
to AGREEMENT for ENGINEERING SERVICES
between OLSSON ASSOCIATES
dba LINCOLN HAYMARKET INFRASTRUCTURE TEAM and the
WEST HAYMARKET JOINT PUBLIC AGENCY
HAYMARKET INFRASTRUCTURE DESIGN PROJECT
Project No. 870000

This Contract Amendment is made by and between Olsson Associates, dba Lincoln Haymarket Infrastructure Team, hereinafter called ENGINEER, and the West Haymarket Joint Public Agency, hereinafter called JPA, this _____ day of _____ 2011 and approved by Resolution No. _____.

WHEREAS, it is the mutual desire of the parties hereto to amend the Agreement to provide professional services associated with the Haymarket Infrastructure Design Contract which was entered into on November 18, 2010 under Resolution WH-12, hereinafter called the existing Agreement. The general description of work to be added to the existing Agreement under this Amendment generally shall include completion of work associated with additional services for the 10th and Salt Creek Roadway Improvement Project; additional services for the design work on the "M" and "N" Street Project; final design for ITS Components and Dynamic Message Signs; preliminary design for the future Parking Garage No. 2 which is to co-locate with the District Energy Corporation Plant; the addition of construction phase services to provide construction management, on-site observation, geotechnical testing and other material testing for the Initial Haymarket Site Preparation Project and the USPS Parking Lot Reconstruction Project; and traffic analysis and conceptual design work to identify interim improvements at 1st and Cornhusker and at Sun Valley & West "O" Street to facilitate traffic flow for pre-event and post-event scenarios associated with the new arena. A detailed breakdown of scope and fee for each of these project components is included in the attached appendices as shown below:

- 10th and Salt Creek Roadway Improvements Additional Services – Appendix A-3 Additional Services
- "M" and "N" Street, 7th to 10th Street Improvements Additional Services – Appendix A-5 Additional Services
- ITS and Dynamic Message Signs – Appendix A-13
- Parking Garage No. 2 – Partial Design to Co-Locate With DEC – Appendix A-18
- Initial Site Preparation and USPS Parking Lot Construction Phase Services – Appendix A-19
- 1st and Cornhusker and Sun Valley & West "O" Street, Traffic Analysis and Interim Design – Appendix A-20.

The schedule for completion of the work outlined in Appendix A-3 Additional Services, Appendix A-5 Additional Services, Appendix A-13, Appendix A-18, Appendix A-19 and Appendix A-20 is shown in Appendix B-4 which is attached to this amendment.

The estimated fee for the additional services for the 10th and Salt Creek Roadway Improvements is $78,034.00; the estimated fee for the additional services for the "M" and "N" Street, 7th to 10th

Street Project is $56,891.00; the estimated fee for completion of the ITS and Dynamic Message Sign design work is $669,796.00; the estimated fee for the completion of the preliminary design for Parking Garage No. 2 is $407,392.00; the estimated fee to provide the construction management, testing and field observation services for the Initial Site Preparation and USPS Parking Lot Reconstruction Projects is $573,564.00; and the estimated fee for completion of the preliminary work to complete the traffic analysis and conceptual design for interim improvements at 1st and Cornhusker and Sun Valley and West "O" Street is $39,370.00. The total estimated fee for the work associated with this Amendment is $1,825,047.00, which increases the total not-to-exceed contract amount from $7,500,379.00 to $9,325,426.00.

The JPA recognizes that early work associated with the preliminary design for Parking Garage No. 2, which is co-locating with the new District Energy Corporation Plant, is necessary to allow the design of the new plant to proceed on schedule so that construction is complete and the plant is available to provide heating and cooling to the new arena by November of 2012. Therefore the JPA has provided the Engineer an early notice to proceed with the preliminary design work on Parking Garage No. 2 as outlined in Appendix A-18, effective February 14, 2011 to allow the structural design and foundation designs for the future garage and new District Energy Corporation Plant to be coordinated so that the plant design remains on schedule.

NOW THEREFORE, it is hereby agreed that the existing Agreement be amended to include the services as described in the attached appendices, "Appendix A-3 Additional Services", "Appendix A-5 Additional Services, "Appendix A-13", "Appendix A-18", "Appendix A-19" and "Appendix A-20".

This AMENDMENT shall be deemed a part of, and shall be subject to all terms and conditions of the existing Agreement. Except as modified above, the existing Agreement shall remain in full force and effect.

West Haymarket Joint Public Agency

_____

Title:_____

Engineer – Olsson Associates dba
Lincoln Haymarket Infrastructure Team

By: _____ By: _____

Title:_____ Title:_____

APPENDIX A-3 – ADDITIONAL SERVICES
Scope of Services

HAYMARKET INFRASTRUCTURE PROJECT
10TH AND SALT CREEK ROADWAY IMPROVEMENTS

City Project Number 870304

General Description of Additional Services

During the design of the improvements for the 10th and Salt Creek Project additional services were identified that were not included in the original scope. This includes the necessary design, right-of-way design and coordination for the new parking lots to be constructed at the Star City Federal Property, including preparation of exhibits for the agreement between the JPA and property owner as requested by City Law; additional survey costs associated with potholing of LES buried utilities to accommodate early relocation of LES cables to facilitate the short construction timeframe; additional ITS design for the construction of Dynamic Message Signs not originally proposed for the project; additional stakeholder coordination with property owners that include UNL, UNL Alumni Association, and the Citizenship and Immigration Service; additional design for communication conduits/wiring outside of the original scope, this includes coordination with UNL and Husker Vision; and additional work to provide detailed photometrics for lighting design completed by LES to review light levels at the double roundabouts and subsequent redesign and redrafting of lighting plans to meet lighting requirements at the double roundabouts (this is a unique layout for the roundabouts with the easterly roundabout located under the 10th Street Bridge and lighting is a critical design element for proper operation and safety at the roundbouts). In addition, construction phase services have been expanded to include additional time for the Project Engineer to assist the JPA's Construction Manager and field staff with oversight and coordination of the construction work due to the accelerated construction schedule and to facilitate coordination with key stakeholders.

The following are the task items that are included as part of the scope of services for the 10th and Salt Creek Roadway Improvements.

Task 1. Project Management

No Additional Services.

Task 2. Project Specific Meetings

No Additional Services.

TASK 3. Survey

a. *Field Survey and Potholing of LES Facilities*

This includes the necessary field staking of proposed design features and staking for potholing of LES facilities including the cost of the potholing.

TASK 4. Utility Coordination

No Additional Services.

Task 5. Public Involvement

a. One-on-One, Small Group Meetings

The original scope included up to six meetings with key stakeholders. The total number of meetings required to date have exceeded 12 meetings. These include multiple meetings with UNL, the UNL Alumni Association, the Citizenship and Immigration Services, the Star City Federal Property Owners, the Eighth and "T" LLC Property Owners, and the Nebraska Department of Roads. This work also includes preparation of exhibits and or other presentation material provided to the stakeholders at the meetings.

Task 6. Drainage Analysis

No Additional Services.

Task 7. Traffic and Lighting

a. ITS Design

The original scope only included design for a 4" conduit along the segment of Arena Drive that is being constructed as part of this project. This has expanded significantly with additional conduits routes from Memorial Stadium to the 8th and "S" Street area, additional coordination with Husker Vision fiber and other City/UNL coordination. In addition, it was determined that a Dynamic Message Sign should be installed as part of this project to allow for a dual westbound exit at the westerly roundabout during events.

Lighting will be designed by Lincoln Electric Systems (LES) after the Design Team supplies LES with electronic files. The Design Team will draft the lighting plans based on LES design.

b. Lighting

Lighting was originally designed by Lincoln Electric Systems (LES) after the Design Team supplies LES with electronic files and the Design Team drafted the plans. As part of the review and audit for the Roundabout Design, the photometrics for the lighting was required. LES was unable to provide detailed photometrics for the lighting and the Design Team developed the photometrics for use in the review of the roundabouts. Subsequent review of the lighting at the roundabouts identified deficiencies in the lighting and the Design Team was required to redesign and redraft the lighting for the project to maintain the project schedule.

Task 8. First Submittal

a. Additional Design For Parking Lot

The Design Team prepared the preliminary design for the new parking lots to be constructed as part of this project at the Star City Federal Property. This included geometrics, construction/removal, drainage, fencing, phasing and pavement marking plans.

Task 9. Geotechnical Evaluation

No Additional Services.

Task 10. Environmental / Historical Review

No Additional Services.

Task 11. Existing Water Main or Wastewater Relocation

No Additional Services.

Task 12. Structural Design

No Additional Services.

Task 13. New / Replacement Water Main Design

No Additional Services.

Task 14. New / Replacement Wastewater Design

No Additional Services.

Task 15. Right-of-Way

a. *Right-of-Way Exhibits and Legal Descriptions*

The Design Team was required to prepare additional right-of-way exhibits and legal descriptions for the property to be transferred from the JPA/City to the Star City Federal Property and the Eighth and "T" LLC properties.

Task 16. Streetscape and Landscape Design

No Additional Services.

Task 17. Second Submittal

a. *Additional Design For Parking Lot*

The Design Team prepared the preliminary design for the new parking lots to be constructed as part of this project at the Star City Federal Property. This included geometrics, construction/removal, drainage, fencing, phasing and pavement marking plans.

b. *Exhibits for Star City Federal and Eighth and "T" LLC Agreements*

The Design Team prepared exhibits as requested by City Law for the agreements with the Star City Federal Property owners and the Eighth and "T" LLC property owners. This included colored exhibits outlining property to be exchanged as well as parking lot reconfiguration and phasing for construction of parking lots with the number of available parking stalls identified during each phase of the construction.

Task 18. Quality Assurance / Quality Control (QA / QC)

No Additional Services.

Task 19. Permit Applications / Agreements

No Additional Services.

Task 20. PS&E Submittals

No Additional Services.

Task 21. Bidding Phase

No Additional Services.

Task 22. Construction Phase

a. *Additional Assistance for the Construction Manager*

The Design Team shall have the Project Engineer work closely with the JPA's Construction Manager throughout the construction period to assist with project coordination, stakeholder coordination and to allow for expedient review and development of resolutions to any changed conditions encountered so that the project stays on schedule. This will include the Project Engineer assisting with the following tasks:

- Prepare and conduct the Pre-Construction Meeting. Meet with the Contractor on-site to review the work and to identify early items of construction that can begin prior to April 18th.
- Attend the weekly progress meetings to assist the Construction Project Manger with evaluating the Contractor's progress and identifying potential issues and resolutions to these issues so that the project stays on schedule.
- Coordinate with Key Stakeholders to keep them informed regarding the status of the work and potential impacts to their properties.
- Assist the Construction Project Manager with general coordination with the Contractor and the BNSF Railway representatives.
- Answer questions regarding the construction and assist with interpretation of contract documents.
- Coordinate with the Construction Manager on review and approval of Contractor proposals related to changes in the work.
- Review the construction layout as the work progresses to ensure that the roadway geometrics are properly constructed, especially at the roundabouts where the geometrics are critical elements. This would include having a survey crew provide quality control checks of the geometric layout at key points during the construction to make sure that everything is correct before constructing the new pavement. The Project Engineer would coordinate with the survey crew on the quality control checks.

Appendix A-3 Additional Services
Total Project Fee

10th and Salt Creek Roadway Improvements
City Project Number 870304

Task No.	Task Description		Fee Estimate
1	Project Management		$0.00
2	General Project Meetings		$0.00
3	Survey		$2,156.00
4	Utility Coordniation		$0.00
5	Public Involvement		$4,288.00
6	Drainage Analysis		$0.00
7	Traffic		$13,040.00
8	First Submittal		$4,576.00
9	Geotechnical Evaluation		$0.00
10	Environmental / Historical Review		$0.00
11	Exist Water - Sanitary Relocates		$0.00
12	Structural / Bridge Design		$0.00
13	Water Main Design		$0.00
14	Wastewater Design		$0.00
15	Right-of-Way		$3,304.00
16	Landscape Design		$0.00
17	Second Submittal		$7,024.00
18	QA/QC		$0.00
19	Permit Applications		$0.00
20	PS&E Submittals		$0.00
21	Bidding Phase		$0.00
22	Construction Phase		$41,646.00
	Expenses		$2,000.00
		Total Project Cost	$78,034.00

PAY RATES (BASED ON HOURLY RATE SCHEDULE PER CLASSIFICATION)

Overhead Rate : 0%

Profit : 0%

Personnel		Total Hr.	Salary $ Per Hr.	Labor Cost	Total Cost
Principal/Project Manager	P/PM	0	$180.00	$0	$0.00
Team Leader	TL	12	$162.00	$1,944	$1,944.00
Group Leader	GL	2	$148.00	$296	$296.00
Senior Engineer	SE	0	$155.00	$0	$0.00
Senior Project Engineer	SPE	269	$142.00	$38,198	$38,198.00
Project Engineer	PE	124	$115.00	$14,260	$14,260.00
Associate Engineer	AE	0	$98.00	$0	$0.00
Assistant Engineer	ASE	0	$85.00	$0	$0.00
Senior Scientist	SS	0	$120.00	$0	$0.00
Senior Project Scientist	SPS	0	$105.00	$0	$0.00
Project Scientist	PS	0	$90.00	$0	$0.00
Associate Scientist	ACS	0	$70.00	$0	$0.00
Assistant Scientist	AS	0	$60.00	$0	$0.00
Surveyor	SM	56	$80.00	$4,480	$4,480.00
Survey Crew Member (CM)	SCM	56	$55.00	$3,080	$3,080.00
Technical Manager	TM	28	$118.00	$3,304	$3,304.00
Design Technician	DT	18	$84.00	$1,512	$1,512.00
Senior Technician	ST	112	$80.00	$8,960	$8,960.00
Technicain	Tech	0	$71.00	$0	$0.00
Administrative Coordinator	AC	0	$70.00	$0	$0.00
Administrative Assistant	AA	0	$60.00	$0	$0.00
Expenses					**$2,000.00**
		677		**$76,034**	**$78,034.00**

TOTAL EXPENSES					
Expenses	**Amount**		**$ Ea.**		**Cost**
Design					
Travel, mile (car)		MILES	0.50		$0.00
Travel, mile (survey vehicle)		MILES	0.68		$0.00
Subconsultant - Ourston Roundabout (lump sum)		L.S.	0		$0.00
Half Size Plots (each)		EA.	0.3		$0.00
Mylars, Half Size Plots (each)		EA.	4.5		$0.00
Aerial Mapping (DTM)		L.S.			$0.00
Miscellaneous Expenses(Plots, Copies, Reports, etc.)		L.S.	1591		$0.00
Pothoing	1	L.S.	2000		$2,000.00
			Sub Total		**$2,000.00**
Survey Expenses					
Public Involvement Expenses					
			Total		**$2,000.00**

MAN-HOUR ESTIMATE - 10TH AND SALT CREEK ROADWAY IMPROVEMENTS/PROJECT NUMBER 870304

Task No.	Description of Work Items / Tasks	P/PM	TL	GL	SE	SPE	PE	AE	ASE	SS	SPS	PS	ACS	AS	SM	SCM	TM	DT	ST	Tech	AC	AA	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
1	**Project Management**																												
	Project Management																						0	$0	$0	$0	$0	**$0.00**	
	Coordination with Others																						0	$0	$0	$0	$0	**$0.00**	
	Design Memorandum																						0	$0	$0	$0	$0	**$0.00**	
	Condemnation Hearings																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
2	**General Project Meetings**																												
	Progress Meetings																						0	$0	$0	$0	$0	**$0.00**	
	Review Meetings																						0	$0	$0	$0	$0	**$0.00**	
	Plan-in-Hand																						0	$0	$0	$0	$0	**$0.00**	
	Meetings with Appraiser & Acquisition Staff																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
3	**Survey**																												
	Additional Survey for Potholing & Utility Locates			2			4								8	8			4				26	$2,156	$0	$2,156	$0	**$2,156.00**	
	Base Map Preparation																						0	$0	$0	$0	$0	**$0.00**	
	Horizontal Control																						0	$0	$0	$0	$0	**$0.00**	
	Vertical Control																						0	$0	$0	$0	$0	**$0.00**	
	Locate Section Corners																						0	$0	$0	$0	$0	**$0.00**	
	Bench Level Run																						0	$0	$0	$0	$0	**$0.00**	
	Utility Locates																						0	$0	$0	$0	$0	**$0.00**	
																													$2,156.00
4	**Utility Coordination**																												
	Utility Location / Verification																						0	$0	$0	$0	$0	**$0.00**	
	Utility Plan Submittal																						0	$0	$0	$0	$0	**$0.00**	
	Utility Review Meetings / Coordination																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
5	**Public Involvement**																												
	Public Involvement Planning Meetings																						0	$0	$0	$0	$0	**$0.00**	
	Public Involvement Plan																						0	$0	$0	$0	$0	**$0.00**	
	Database Development / Maintenance																						0	$0	$0	$0	$0	**$0.00**	
	Key Stakeholder Outreach																						0	$0	$0	$0	$0	**$0.00**	
	City Council (1 pre-council, 1 reg meeting)																						0	$0	$0	$0	$0	**$0.00**	
	Open Houses (2)																						0	$0	$0	$0	$0	**$0.00**	
	One-on-One, Small Group Meetings		12			12													8				32	$4,288	$0	$4,288	$0	**$4,288.00**	
	Newsletters / Informational Materials																						0	$0	$0	$0	$0	**$0.00**	
	Web Site Development																						0	$0	$0	$0	$0	**$0.00**	
	Final PI Report / Documentation																						0	$0	$0	$0	$0	**$0.00**	
																													$4,288.00
6	**Drainage Analysis**																												
	Hydraulic / Hydrologic Analysis																						0	$0	$0	$0	$0	**$0.00**	
	Floodplain Study																						0	$0	$0	$0	$0	**$0.00**	
	Preliminary Drainage Studies																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
7	**Traffic**																												
	Traffic Data Collection																						0	$0	$0	$0	$0	**$0.00**	
	Traffic Analysis																						0	$0	$0	$0	$0	**$0.00**	
	Additional ITS Design and Communication Conduits						40												24				64	$6,520	$0	$6,520	$0	**$6,520.00**	
	Street Lighting						40												24				64	$6,520	$0	$6,520	$0	**$6,520.00**	
																													$13,040.00
8	**First Submittal**																												
	Additional Work for Parking Lot Design					8	16												20				44	$4,576	$0	$4,576	$0	**$4,576.00**	
																													$4,576.00
9	**Geotechnical Investigation**																												
	Data Research																						0	$0	$0	$0	$0	**$0.00**	
	Design Recommendations																						0	$0	$0	$0	$0	**$0.00**	
	Geotechnical Report																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
10	**Environmental/Historical Review**																												
	NEPA Environmental Review																						0	$0	$0	$0	$0	**$0.00**	
	Traffic Noise Study																						0	$0	$0	$0	$0	**$0.00**	
	Hazardous Material Review																						0	$0	$0	$0	$0	**$0.00**	
	Wetlands and Habitat Investigation																						0	$0	$0	$0	$0	**$0.00**	
	Wetland Permitting																						0	$0	$0	$0	$0	**$0.00**	
	Historical / Archeological Investigation																						0	$0	$0	$0	$0	**$0.00**	
	Impacts to Misc. Environmental Resources																						0	$0	$0	$0	$0	**$0.00**	
	Prepare Draft Environmental Review																						0	$0	$0	$0	$0	**$0.00**	
	Endangered Species Review																						0	$0	$0	$0	$0	**$0.00**	
	Public Land Impacts (4F or 6F)																						0	$0	$0	$0	$0	**$0.00**	

MAN-HOUR ESTIMATE - 10TH AND SALT CREEK ROADWAY IMPROVEMENTS/PROJECT NUMBER 870304

Task No.	Description of Work Items / Tasks	P/PM	TL	GL	SE	SPE	PE	AE	ASE	SS	SPS	PS	ACS	AS	SM	SCM	TM	DT	ST	Tech	AC	AA	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
																													$0.00
11	**Water Main/Wastewater Relocation**																												
	Water Main/Wastewater Relocation																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
12	**Structural Design**																												
	Retaining Wall																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
13	**Water Main Design**																												
	Horizontal Alignment																						0	$0	$0	$0	$0	**$0.00**	
	Vertical Alignment																						0	$0	$0	$0	$0	**$0.00**	
	Detail Drawings																						0	$0	$0	$0	$0	**$0.00**	
	Utility Conflict Verification and Resolution																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
14	**Wastewater Design**																												
	Horizontal Alignment																						0	$0	$0	$0	$0	**$0.00**	
	Vertical Alignment																						0	$0	$0	$0	$0	**$0.00**	
	Detail Drawings																						0	$0	$0	$0	$0	**$0.00**	
	Utility Conflict Verification and Resolution																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
15	**Right-of-Way**																												
	Additional ROW Design																28						28	$3,304	$0	$3,304	$0	**$3,304.00**	
	Legal Descriptions																						0	$0	$0	$0	$0	**$0.00**	
	Stake Right-of-Way																						0	$0	$0	$0	$0	**$0.00**	
																													$3,304.00
16	**Landscape Design**																												
	Landscape Design																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
17	**Second Submittal**																												
	Second Submittal Design for Parking Lot					12	24												32				68	$7,024	$0	$7,024	$0	**$7,024.00**	
																													$7,024.00
18	**QA/QC**																												
	Plan Review																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
19	**Permit Applications**																												
	404 Permit																						0	$0	$0	$0	$0	**$0.00**	
	Floodplain Permit																						0	$0	$0	$0	$0	**$0.00**	
	SWPPP																						0	$0	$0	$0	$0	**$0.00**	
	NPDES Permit																						0	$0	$0	$0	$0	**$0.00**	
	Railroad Permit																						0	$0	$0	$0	$0	**$0.00**	
	Railroad Agreement																						0	$0	$0	$0	$0	**$0.00**	
	Railroad Insurance																						0	$0	$0	$0	$0	**$0.00**	
	NDOR Use of Right of Way Permit																						0	$0	$0	$0	$0	**$0.00**	
	NDOR Agreement																						0	$0	$0	$0	$0	**$0.00**	
	Lancaster County Utility Permit																						0	$0	$0	$0	$0	**$0.00**	
	Lancaster County Inter-local Agreement																						0	$0	$0	$0	$0	**$0.00**	
	Nebraska Dept. of Environmental Quality																						0	$0	$0	$0	$0	**$0.00**	
	City/County Health Dept. Noise Permit																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
20	**PS&E Submittals**																												
	Draft PS&E Submittal																						0	$0	$0	$0	$0	**$0.00**	
	Final PS&E Submittal																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
21	**Bidding Phase**																												
	Attend Pre-Bid Meeting																						0	$0	$0	$0	$0	**$0.00**	
	Answer Design Questions																						0	$0	$0	$0	$0	**$0.00**	
	Prepare Addenda																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
22	**Construction Phase**																												
	Prepare for and Conduct Pre-Con Meeting					8																	8	$1,136	$0	$1,136	$0	**$1,136.00**	
	Attend Weekly Progress Meetings (24 weeks)					72																	72	$10,224	$0	$10,224	$0	**$10,224.00**	
	Coordination with Stakeholders					48																	48	$6,816	$0	$6,816	$0	**$6,816.00**	
	Answer Construction Related Questions					48																	48	$6,816	$0	$6,816	$0	**$6,816.00**	
	Coordinate with PM on Contractor Proposals					48																	48	$6,816	$0	$6,816	$0	**$6,816.00**	
	Review Construction Layout					48									48	48		18					162	$14,808	$0	$14,808	$0	**$14,808.00**	
	Less Time for Project Engineer in Original Proposal					-35																	-35	-$4,970	$0	-$4,970	$0	**-$4,970.00**	
																							0	$0	$0	$0	$0	**$0.00**	

MAN-HOUR ESTIMATE - 10TH AND SALT CREEK ROADWAY IMPROVEMENTS/PROJECT NUMBER 870304

Task No.	Description of Work Items / Tasks	P/PM	TL	GL	SE	SPE	PE	AE	ASE	SS	SPS	PS	ACS	AS	SM	SCM	TM	DT	ST	Tech	AC	AA	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
																													$41,646.00
	Total Manhours	0	12	2	0	269	124	0	0	0	0	0	0	0	56	56	28	18	112	0	0	0	677						
	Total	$0	$1,944	$296	$0	$38,198	$14,260	$0	$0	$0	$0	$0	$0	$0	$4,480	$3,080	$3,304	$1,512	$8,960	$0	$0	$0	$76,034	$76,034	$0	$76,034	$0	**$76,034.00**	
	Total Labor, OH & Profit	$0	$1,944	$296	$0	$38,198	$14,260	$0	$0	$0	$0	$0	$0	$0	$4,480	$3,080	$3,304	$1,512	$8,960	$0	$0	$0						**$76,034.00**	

APPENDIX A-5 - ADDITIONAL SERVICES
Scope of Services

"M" AND "N" STREET, 7TH TO 10TH STREET IMPROVEMENTS

JPA Project Number 870302

The original scope of services for the "M" and "N" Street, 7th to 10th Street Improvements Project is being amended as outlined below to include additional services required for survey, utility design and traffic signal design work that was not included in the original scope of work as well as design for the site preparation required to accommodate the proposed Amtrak Station building. The amended scope is identified by project tasks as described below:

TASK 1. Project Management

a. Project Management

The Consultant Project Manager will serve as point of contact and will be responsible for the following:

- Establish and maintain project budget
- Define individual tasks and establish cost and schedule of each task
- Provide forecast showing expenditure by month.
- Provide monthly progress reports, with invoices, showing percent of work completed for each task.

Project Management efforts will follow appropriate guidance as given in the City website "Guiding Principles and Procedures (GP&P)".

b. Coordination with Others

The Consultant will coordinate their design with agencies and/or Consultants that are involved with this project or adjacent projects. Coordination includes one-on-one meetings with the agencies or Consultants. This task does not include coordination with utilities. See Task 4 for coordination with utilities.

c. Design Memorandum

The Design Memorandum for the project was previously completed

d. Condemnation Hearings

Not Applicable (N/A)

TASK 2. General Project Meetings

a. *Kick-Off Meeting*

Kick off meeting was previously held

b. *Progress Meetings*

The Consultant will schedule and attend all progress meetings. The Consultant will create and distribute a meeting agenda at least 48 hours prior to all progress meetings.

c. *Review Meetings*

The Consultant will schedule and attend review meetings to receive the City's review comments on the submittals at the 1st submittal, 2nd submittal and Draft PS&E submittal stages. Review meetings will be combined with Monthly Progress Meetings.

d. *Plan-in-Hand*

The Consultant will schedule and attend a plan-in-hand meeting. This meeting is to be held following the review period of the first submittal.

TASK 3. Survey

a. *Topographical Survey*

The Consultant will perform the necessary topographic ground survey including . A topographic survey will be performed using electronic GPS and/or 'Total Station' technology in Microstation/GEOPAK format. Copies of field book records and electronic records will be submitted to the City at the completion of the final design. Natural topographic features and man-made features will be recorded by coordinates to the nearest one-tenth (0.1) of a foot. All such topographic features, which are pertinent to the design or are necessary to properly show the effect of the proposed work upon the adjoining property and/or improvements, will be recorded. The topographic survey will include a detailed tree count, noting the size, type and location.

The Additional scope of work will require topographic survey in the vicinity of the residence at the SW corner of 4th & J Streets. This survey will be required to relocate the sanitary sewer service hookup. The area around the proposed Amtrak building will also be surveyed.

topographic ground survey including the existing centerline, intersecting streets, alleys and drives, the tying of located land monuments to the existing centerline, sanitary sewer manholes, etc. as needed for the design of the relocation.

b. *Base Map Preparation*

Consultant will create the base map using the topographic survey data and submit it to the City for review.

c. *Horizontal Control*

The Consultant shall provide a list of horizontal control points with coordinates, descriptions, station and offset. Horizontal control will be referenced to the Lancaster County Grid using known land survey monuments.

d. Vertical Control

N/A - Previously established.

e. Locate Section Corners

N/A

f. Bench Level Run

N/A Surevy control has previously been established

g. Utility Locates

Utilities will be drawn from surveying above ground features. Information supplied by utility companies will be used to complete the placement of existing utilities on the plans. Locations from utility plans will be transferred into the topographic base map. Where available, above ground features will be used to improve accuracy. The Consultant will add a disclaimer to the drawings with respect to the undetermined location of underground utilities.

TASK 4. Utility Coordination

a. Utility Location/Verification

The Consultant will review the utility locations shown on the plans, and verify these locations during field inspections. After survey is complete, plans will be printed and distributed to utility companies for verification of ownership, type, size, location, and cased or uncased.

The Consultant will request that the Utility Companies return to the Consultant marked up plans with utility verification. The Consultant will incorporate the information into the topographic base map. All utilities identified in the topographic survey and verified by the individual utility will be incorporated into the plans.

Identification and verification by the Utility Companies of major utility conflicts such as fiber optic lines, gas pipelines, crude oil pipelines, high-pressure waterlines, transmission lines, etc., will be accomplished at the earliest possible time. The Consultant and the City's Project Manager will discuss major conflicts and attempt to avoid them. If avoidance is not possible, the Consultant will then request the Utility Company to verify the conflict and provide a preliminary estimate of reimbursable costs associated with the utility relocation.

b. Utility Review Meetings/Coordination

Any utility review meeting should be scheduled to coincide with a regular project progress meeting or City review meeting. The Consultant shall include time for coordination via the phone and one-on-one meetings with affected utilities, depending on the complexity of the project.

TASK 5. Public Involvement

a. Open Houses (0 Meeting)

No Public meetings will be required for this project.

b. *One-on-One, Small Group Meetings (0 Meetings)*

N/A

c. *Final Public Involvement Report / Documentation*

N/A

TASK 6. Drainage Analysis

a. *Hydraulic/Hydrologic Analysis*

N/A

b. *Preliminary Drainage Studies*

N/A Drainage studies and development storm sewers have been previously designed by others. This project will develop a site grading and drainage plan that will tie into the overall development storm sewer system.

Temporary drainage design around the Amtrak building will be designed to drain the site until the future permanent roadway is constructed in front of Amtrak.

TASK 7. Traffic

a. *Traffic Signal / ITS Design / Street Lighting*

The original project scope was estimated to minimize the amount of traffic signal modifications to only what was absolutely necessary and leave as much of the existing signal system in tact as possible. As the project has evolved these modifications have increased with requests for additional signal heads and associated wiring, relocations of pull boxes, etc.

The City Traffic staff have requested additional conduits for future fiber optics be installed along the North side of M Street, East side of 8th Street and the South side of N Street for future fiber optic network expansion and ITS needs. This requires additional conduit, pull boxes, tracer wire, construction notes, etc.

Also in the course of the work it has been realized through the City review process that a fiber optic line running along the West side of 10th Street from approximately L to O Street is too shallow to remain in its current location and must be replaced with the project.

TASK 8. First Submittal

a. *Site Inspections (Estimated 2 Visits)*

b. *Prepare Alternatives*

Consultant will work with the Architect to evaluate possible alternatives regarding site layout, building location and access for the proposed Amtrak Station.

c. *Preliminary Designs*

The Consultant shall prepare a preliminary report and schematic for the first submittal to the City. The first submittal should include the following:

- Cover Sheet
- Grading Plans
- Residential Sanitary removal and reconstruction plan
- Upgraded traffic signal plans
- Details

d. Cost Estimates

The Consultant shall prepare an updated total project cost estimate. This shall include Preliminary Engineering and Site Construction Cost Estimates.

TASK 8. Existing Water Main or Wastewater Relocation

The residence at the SW corner of 4th & J Streets will need to have their sanitary service relocated from the sanitary sewer it is currently connected to in 4th Street because that sewer line is to be abandoned with the West Haymarket project. That service will need to be connected to the newer existing sanitary sewer in J Street.

TASK 9. Project Access

Access to a temporary roadway and parking lot are being provided in the original M & N Street project.

TASK 10. Second Submittal

a. Second Submittal Design

The Consultant shall prepare project base files and plan sheets in accordance with the City of Lincoln CADD standards. All sheets that will be included in the PS&E plan set will be included in the second submittal. This includes, but not limited to, the following sheets:

- Cover Sheet
- Summary of Quantities Sheet
- General Notes Sheets
- Sanitary Abandonment Plans
- Detail Sheets
- Horizontal/Vertical Control Sheets
- Grading Plan for proposed Amtrak Station
- Site Paving and Sidewalk for Proposed Amtrak Station
- Residential Sanitary Sewer Removal and Reconstruction Plan
- Sanitary Sewer Abandonment Plan
- Site Utilities Plan (Sanitary Water, Storm, Gas and Electrical Services)
- Details
- Construction Special Provisions

TASK 11. Quality Assurance / Quality Control (QA / QC)

The consultant will submit in writing that this plan has been used during the project at each submittal with the name of the person responsible for performing the QA / QC aspects.

TASK 12. Permit Applications / Agreements

The Consultant shall prepare and submit on behalf of the City of Lincoln the following permits, agreements, certifications, and forms. The Consultant shall copy the City's project manager on all applications being submitted.

- ❑ SWPPP - NPDES Permit

TASK 13. PS&E Submittal

a. Draft PS&E Submittal

The Consultant shall submit a draft PS&E package, along with all project checklists, to the City's Project Manager for final review. The package will include the plan set, special provisions, and a total project cost estimate. The Consultant shall prepare an updated total project cost estimate. This shall include, but not be limited to Engineering, Private Utility Relocations, Public Utility Relocations, Construction, and Construction Engineering on the appropriate forms. The Construction Estimate shall be prepared using the current City of Lincoln's version of Appia software and submitted electronically.

b. Final PS&E Submittal

Upon incorporating review comments into the plan set and special provisions, the Consultant shall prepare and submit all drawings, special provisions, and an updated total project cost estimate using Appia, to the City's Project Manager for the final PS&E review. Upon City acceptance of the PS&E plans, the Consultant shall submit the bid package to the City's Project Manager. The bid package includes sealed drawings, sealed special provisions, and an Appia electronic file. The bid package will also be accompanied by an electronic copy of the design in MicroStation.

The following sheets are anticipated to be included in the PS&E Submittal's

- Cover Sheet
- Summary of Quantities Sheet
- General Notes Sheet
- Detail Sheets
- Horizontal/Vertical Control Sheets
- Construction and Removal Sheets
- Storm Drainage Plan and Profile Sheets
- Sediment and Erosion Control Sheets
- Grading Plan
- Residentaial Sanitary Sewer Removal and Reconstruction Plan
- Sanitary Sewer Abandonment Plan
- Updated Traffic Signal Plans
- Details
- Construction Special Provisions

b. Cost Estimates

The Consultant shall prepare an updated total project cost estimate. This shall include, but not be limited to Preliminary Engineering, ROW acquisition, Private Utility Relocations, Public Utility Relocations, Construction, and Construction Engineering on the appropriate forms. The Construction Estimate shall be prepared using the current City of Lincoln's version of Appia software and submitted electronically.

c. Special Provisions

The Consultant will submit Special Provisions with the PS&E submittal.

TASK 14. Bidding Phase

a. This item is not affected by this amendment at this time.

TASK 15. Construction Phase

No additional services included with this scope of work.

City Responsibilities

The City of Lincoln will supply the following information:

- ❑ Available water and sewer locations, size, and materials
- ❑ Copies of available reports
- ❑ Available drainage studies
- ❑ Available geotechnical reports
- ❑ Bench marks and horizontal control points
- ❑ Topographic Survey
- ❑ Available plats of adjacent properties
- ❑ APPIA files and bid history

GENERAL INFORMATION

1. PLAN FORMAT

Six Half size (11" x 17") white paper bond copies of the plans will be submitted at the first submittal, second submittal, and draft PS&E submittal. One half size (11" x 17") white paper bond copy of the plans will be submitted for PS&E review. Any material, which does not produce an acceptable reproduction will be returned to the Consultant for rectification. All submittals shall be bound with post screws or staples.

Final plans will be submitted on 11" x 17" Bond paper and will be accompanied by an electronic copy of the design in MicroStation, GEOPAK format. GEOPAK GPK files will also be submitted.

All sheets will be plotted at the City of Lincoln's standard sheet scales.

Care will be exercised in drawing all construction details. All notes will be properly spaced and all lettering will be of an engineering style. Clarity must be maintained to allow the plans to be archived on microfilm; the background topography, grid lines etc. on plan and profile sheets will be removed behind the text.

The Consultant shall follow the City of Lincoln's CADD drafting procedures and guidelines in preparing the plans.

The CADD files will conform to the following standards and conventions. All plans, specifications, and documents will be in English units using the following working units:

a) Master Units = Ft
b) Sub Units = 100th
c) Position Units = 1

Global origin of the graphics design plane will be located at x= 0.0000, y= 0.0000.

Reports, Studies and Technical Information:

The Consultant shall prepare and submit the following items:

1. Technical memos for all pertinent meetings
2. Meeting minutes from all meetings
3. Drainage computations, culverts and storm drainage design
4. Miscellaneous correspondence and information related to the project
5. Summary of quantities and opinion of probable cost
6. Permit applications
7. Special Provisions for items not covered by the City of Lincoln Standard Specifications

Cross-sections

N/A

2. RIGHT-OF-WAY SUBMITTALS

N/A

Appendix A-5 - Additional Services
Total Project Fee

"M" and "N" Street, 7th to 10th Street Improvements
JPA Project Number 870302

Task No.	Task Description		Fee Estimate
1	Project Management		$1,944.00
2	General Project Meetings		$0.00
3	Survey		$0.00
4	Utility Coordination		$0.00
5	Public Involvement		$0.00
6	Drainage Analysis		$0.00
7	Traffic		$0.00
8	First Submittal		$0.00
9	Geotechnical Evaluation		$0.00
10	Environmental / Historical Review		$0.00
11	Exist Water - Sanitary Relocates		$0.00
12	Structural / Bridge Design		$0.00
13	Water Main Design		$0.00
14	Wastewater Design		$0.00
15	Right-of-Way		$0.00
16	Landscape Design		$0.00
17	Second Submittal		$0.00
18	QA/QC		$0.00
19	Permit Applications		$0.00
20	PS&E Submittals		$0.00
21	Bidding Phase		$0.00
22	Construction Phase		$0.00
	Expenses (Includes Subconsultant)		$54,947.00
		Total Project Cost	$56,891.00

OA PAY RATES (BASED ON HOURLY RATE SCHEDULE PER CLASSIFICATION)

Overhead Rate : 0%

Profit : 0%

Personnel		Total Hr.	Salary $ Per Hr.	Labor Cost	Total Cost
Principal/Project Manager	P/PM	0	$180.00	$0	$0.00
Team Leader	TL	12	$162.00	$1,944	$1,944.00
Group Leader	GL	0	$148.00	$0	$0.00
Senior Engineer	SE	0	$155.00	$0	$0.00
Senior Project Engineer	SPE	0	$142.00	$0	$0.00
Project Engineer	PE	0	$115.00	$0	$0.00
Associate Engineer	AE	0	$98.00	$0	$0.00
Assistant Engineer	ASE	0	$85.00	$0	$0.00
Senior Scientist	SS	0	$120.00	$0	$0.00
Senior Project Scientist	SPS	0	$105.00	$0	$0.00
Project Scientist	PS	0	$90.00	$0	$0.00
Associate Scientist	ACS	0	$70.00	$0	$0.00
Assistant Scientist	AS	0	$60.00	$0	$0.00
Surveyor	SM	0	$80.00	$0	$0.00
Survey Crew Member (CM)	SCM	0	$55.00	$0	$0.00
Technical Manager	TM	0	$118.00	$0	$0.00
Design Technician	DT	0	$84.00	$0	$0.00
Senior Technician	ST	0	$80.00	$0	$0.00
Technicain	Tech	0	$71.00	$0	$0.00
Administrative Coordinator	AC	0	$70.00	$0	$0.00
Administrative Assistant	AA	0	$60.00	$0	$0.00
Expenses					**$54,947.00**
		12		**$1,944**	**$56,891.00**

TOTAL EXPENSES					
Expenses	**Amount**		**$ Ea.**		**Cost**
Design					
Travel, mile (car)		MILES	0.50		$0.00
Travel, mile (survey vehicle)		MILES	0.68		$0.00
Subconsultant - Benesch	1	L.S.	54947		$54,947.00
Half Size Plots (each)		EA.	0.3		$0.00
Mylars, Half Size Plots (each)		EA.	4.5		$0.00
Aerial Mapping (DTM)		L.S.			$0.00
Miscellaneous Expenses(Plots, Copies, Reports, etc.)		L.S.	500		$0.00
Geotechnical Borings and Lab Testing		L.S.	200		$0.00
			Sub Total		**$54,947.00**
Survey Expenses					
Public Involvement Expenses					
			Total		**$54,947.00**

OA MAN-HOUR ESTIMATE - M and N Street, 7th to 10th Street Additional Services

Task No.	Description of Work Items / Tasks	P/PM	TL	GL	SE	SPE	PE	AE	ASE	SS	SPS	PS	ACS	AS	SM	SCM	TM	DT	ST	Tech	AC	AA	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
1	**Project Management**																												
	Project Management		12																				12	$1,944	$0	$1,944	$0	**$1,944.00**	
	Coordination with Others																						0	$0	$0	$0	$0	**$0.00**	
	Design Memorandum																						0	$0	$0	$0	$0	**$0.00**	
	Condemnation Hearings																						0	$0	$0	$0	$0	**$0.00**	
																													$1,944.00
2	**General Project Meetings**																												
																													$0.00
3	**Survey**																												
																													$0.00
4	**Utility Coordination**																												
																													$0.00
5	**Public Involvement**																												
																													$0.00
6	**Drainage Analysis**																												
																													$0.00
7	**Traffic**																												
																													$0.00
8	**First Submittal**																												
																													$0.00
9	**Geotechnical Investigation**																												
																													$0.00
10	**Environmental/Historical Review**																												
																													$0.00
11	**Water Main/Wastewater Relocation**																												
																													$0.00
12	**Structural Design**																												
																													$0.00
13	**Water Main Design**																												
																													$0.00
14	**Wastewater Design**																												
																													$0.00
15	**Right-of-Way**																												
																													$0.00
16	**Landscape Design**																												
																													$0.00
17	**Second Submittal**																												
																													$0.00
18	**QA/QC**																												
																													$0.00
19	**Permit Applications**																												
																													$0.00
20	**PS&E Submittals**																												
																													$0.00
21	**Bidding Phase**																												
																													$0.00
	Total Manhours	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12						
	Total	$0	$1,944	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,944	$1,944	$0	$1,944	$0	**$1,944.00**	
	Total Labor, OH & Profit	$0	$1,944	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0						**$1,944.00**	

Appendix A-5 Additional Services
Benesch Project Fee

"M" and "N", 7th to 10th Streets Improvements
JPA Project Number 870302

Task No.	Task Description		Fee Estimate
1	Project Management		$1,932.00
2	General Project Meetings		$910.00
3	Survey		$2,384.00
4	Utility Coordniation		$805.00
5	Public Involvement		$0.00
6	Drainage Analysis		$1,484.00
7	Traffic		$8,176.00
8	First Submittal		$8,458.00
9	Geotechnical Evaluation		$0.00
10	Environmental / Historical Review		$0.00
11	Exist Water - Sanitary Relocates		$0.00
12	Structural / Bridge Design		$0.00
13	Water Main Design		$0.00
14	Wastewater Design		$8,596.00
15	Right-of-Way		$0.00
16	Landscape Design		$0.00
17	Second Submittal		$17,044.00
18	QA/QC		$644.00
19	Permit Applications		$0.00
20	PS&E Submittals		$4,514.00
21	Bidding Phase		$0.00
22	Construction Phase		$0.00
23	Expenses		$0.00
		Total Project Cost	$54,947.00

PAY RATES (BASED ON HOURLY RATE SCHEDULE PER CLASSIFICATION)

Overhead Rate : 0%

Profit : 0%

Personnel		Total Hr.	Hourly Rate (2010)	Cost	Total Cost
Principal	Principal	0	$183.00	$0	$0.00
Senior Project Manager	PM	19	$161.00	$3,059	$3,059.00
Senior Engineer	Sr Eng	103	$161.00	$16,583	$16,583.00
Project Manager	Traffic	56	$140.00	$7,840	$7,840.00
Structural Engineer	STR Eng	0	$0.00	$0	$0.00
Project Engineer I	PE	110	$97.00	$10,670	$10,670.00
Project Engineer II	PE	9	$105.00	$945	$945.00
Senior Technologist	ST	62	$105.00	$6,510	$6,510.00
Designer II	D2	100	$76.00	$7,600	$7,600.00
Office Assistant	CLER	0	$45.00	$0	$0.00
Olsson Associates - QA Review Traffic Signals	OATr	0	$115.00	$0	$0.00
Olsson Associates - QA Review Roadway	OAR	0	$155.00	$0	$0.00
Public Involvement Coordinator	PI Coord	0	$0.00	$0	$0.00
Graphic Designer	GR. DES.	0	$0.00	$0	$0.00
Illustrator	ILL	0	$0.00	$0	$0.00
Webmaster / Database Developer	WM / DD	0	$0.00	$0	$0.00
Survey Project Manager	RLS	0	$0.00	$0	$0.00
Surveyor	RLS	12	$77.00	$924	$924.00
Instrument Operator	IO	16	$51.00	$816	$816.00
Survey Crew Member (CM)	SCM	0	$0.00	$0	$0.00
Survey Technician	Srvy Tech	4	$0.00	$0	$0.00
Expenses					**$0.00**
		491		**$54,947**	**$54,947.00**

TOTAL EXPENSES					
Expenses	**Amount**		**$ Ea.**		**Cost**
Design					
Travel, mile (car)		MILES			$0.00
Travel, mile (survey vehicle)	0	MILES	0.50		$0.00
Environmental Documentation (lump sum)		L.S.			$0.00
Half Size Plots (each)	0	EA.	1		$0.00
Mylars, Half Size Plots (each)	0	EA.	1		$0.00
Aerial Mapping (DTM)		L.S.			$0.00
Miscellaneous Expenses(Plots, Copies, Reports, etc.)	0	L.S.	65		$0.00
Geotechnical Borings and Report		L.S.			$0.00
			Sub Total		**$0.00**
Survey Expenses					
Public Involvement Expenses					
			Total		**$0.00**

MAN-HOUR ESTIMATE - "M" AND "N" STREET, 7TH TO 10TH STREET ADDITIONAL SERVICES

Task No.	Description of Work Items / Tasks	Principal	PM	Sr Eng	Traffic	STR Eng	PE	PE	ST	D2	CLER	OATr	OAR	PI Coord	GR. DES.	ILL	WM / DD	RLS	RLS	IO	SCM	Srvy Tech	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
1	**Project Management**																												
	Project Management		12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	$1,932	$0	$1,932	$0	**$1,932.00**	
	Coordination with Others		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Design Memorandum		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Condemnation Hearings		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
																													$1,932.00
2	**General Project Meetings**																												
	Kick-Off Meeting		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Progress Meetings		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	$322	$0	$322	$0	**$322.00**	
	Review Meetings		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	$322	$0	$322	$0	**$322.00**	
	Plan-in-Hand		0	1	0	0	0	1	0		0	0	0	0	0	0	0	0	0	0	0	0	2	$266	$0	$266	$0	**$266.00**	
																													$910.00
3	**Survey**																												
	Topographical Survey		0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	16	0	0	28	$2,076	$0	$2,076	$0	**$2,076.00**	
	Base Map Preparation		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	$308	$0	$308	$0	**$308.00**	
	Horizontal Control		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Vertical Control		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Locate Section Corners		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Bench Level Run		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Utility Locates		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					0	$0	$0	$0	$0	**$0.00**	
																													$2,384.00
4	**Utility Coordination**																												
	Utility Location / Verification		0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	$161	$0	$161	$0	**$161.00**	
	Utility Plan Submittal		0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	$161	$0	$161	$0	**$161.00**	
	Utility Review Meetings / Coordination		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	$483	$0	$483	$0	**$483.00**	
																													$805.00
5	**Public Involvement**																												
	Public Involvement Planning Meetings		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Public Involvement Plan		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Database Development / Maintenance		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Key Stakeholder Outreach		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	City Council (1 pre-council, 1 reg meeting)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Open Houses (2)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	One-on-One, Small Group Meetings		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Newsletters / Informational Materials		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Web Site Development		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Final PI Report / Documentation		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
																													$0.00
6	**Drainage Analysis**																												
	Hydraulic / Hydrologic Analysis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Floodplain Study	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Amtrak Site Drainage	0	0	4	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	$1,484	$0	$1,484	$0	**$1,484.00**	
																													$1,484.00
7	**Traffic**																												
	Traffic Data Collection	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Traffic Analysis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Traffic Signal / ITS Design / Street Lighting	0	0	16	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	$8,176	$0	$8,176	$0	**$8,176.00**	
	Pavement Marking & Signing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
																													$8,176.00
8	**First Submittal**																												
	Site Inspections	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Produce Video and Still Log	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Prepare Alternatives	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Preliminary Designs	0	1	10	0	0	24	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	59	$5,923	$0	$5,923	$0	**$5,923.00**	
	Cover Sheet	0	0	1	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	5	$507	$0	$507	$0	**$507.00**	
	Typical Section Sheets	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	$304	$0	$304	$0	**$304.00**	
	General Notes Sheet	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	$355	$0	$355	$0	**$355.00**	
	Horizontal/Vertical Control Sheets	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3	$313	$0	$313	$0	**$313.00**	
	Geometric Sheets	0	0	1	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	5	$507	$0	$507	$0	**$507.00**	
	Roadway Plan and Profile Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Right-of-Way Sheets	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Roadway Cross-Section Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Preliminary Construction Phasing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Cost Estimates	0	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	$549	$0	$549	$0	**$549.00**	
																													$8,458.00
9	**Geotechnical Investigation**																												
	Data Research	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Design Recommendations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Geotechnical Report	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	

MAN-HOUR ESTIMATE - "M" AND "N" STREET, 7TH TO 10TH STREET ADDITIONAL SERVICES

Task No.	Description of Work Items / Tasks	Principal	PM	Sr Eng	Traffic	STR Eng	PE	PE	ST	D2	CLER	OATr	OAR	PI Coord	GR. DES.	ILL	WM / DD	RLS	RLS	IO	SCM	Srvy Tech	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
																													$0.00
10	**Environmental/Historical Review**																												
	NEPA Environmental Review	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Traffic Noise Study	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Hazardous Material Review	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Wetlands and Habitat Investigation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Wetland Permitting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Historical / Archeological Investigation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Impacts to Misc. Environmental Resources	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Prepare Draft Environmental Review	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Endangered Species Review	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Public Land Impacts (4F or 6F)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
																													$0.00
11	**Water Main/Wastewater Relocation**																												
	Water Main/Wastewater Relocation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
																													$0.00
12	**Structural/Bridge Design**																												
	Box Culvert Design and Plan Preparation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Lighting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Retaining Wall	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	De-Icing System	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
																													$0.00
13	**Water Main Design**																												
	Horizontal Alignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Vertical Alignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Detail Drawings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Utility Conflict Verification and Resolution	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
		0																											$0.00
14	**Wastewater Design**																												
	Horizontal Alignment	0	0	4	0	0	16	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	36	$3,644	$0	$3,644	$0	**$3,644.00**	
	Vertical Alignment	0	0	4	0	0	16	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	36	$3,644	$0	$3,644	$0	**$3,644.00**	
	Detail Drawings	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	$371	$0	$371	$0	**$371.00**	
	Utility Conflict Verification and Resolution	0	0	1	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	$937	$0	$937	$0	**$937.00**	
																													$8,596.00
15	**Right-of-Way**																												
	Right-of-Way Plans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Legal Descriptions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Stake Right-of-Way	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
																				0									
																													$0.00
16	**Landscape Design**																												
	Landscape Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
																													$0.00
17	**Second Submittal**																												
	Second Submittal Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Cover Sheet	0	0	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	5	$523	$0	$523	$0	**$523.00**	
	Summary of Quantities Sheet	0	0	1	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	6	$657	$0	$657	$0	**$657.00**	
	Typical Section Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	General Notes Sheet	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	$371	$0	$371	$0	**$371.00**	
	Detail Sheets	0	0	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	5	$523	$0	$523	$0	**$523.00**	
	Horizontal/Vertical Control Sheets	0	0	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	4	$447	$0	$447	$0	**$447.00**	
	Construction Phasing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Traffic Control Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Geometric Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Joints and Grades Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Roadway Plan and Profile Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Construction Sheets	0	0	8	0	0	8	0	16	8	0	0	0	0	0	0	0	0	0	0	0	0	40	$4,352	$0	$4,352	$0	**$4,352.00**	
	Removal Sheets	0	0	1	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	17	$1,609	$0	$1,609	$0	**$1,609.00**	
	Retaining Wall Plan and Profile Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Retaining Wall Details	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Storm Drainage Plan and Profile Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Culvert/Channel Cross-Section Sheets	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Sediment and Erosion Control Sheets	0	0	1	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	9	$853	$0	$853	$0	**$853.00**	
	Wastewater Plan and Profile Sheets	0	0	4	0	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	20	$2,028	$0	$2,028	$0	**$2,028.00**	
	Water Main Plan and Profile Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Traffic Signal Plan Sheets	0	0	1	16	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	33	$3,617	$0	$3,617	$0	**$3,617.00**	
	Pavement Marking & Signing Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Lighting Plan Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Landscaping Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Amtrak Platform Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Amtrak\ Consultatn Coordination	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Cost Estimates	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	$1,032	$0	$1,032	$0	**$1,032.00**	
	Special Provisions	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	$1,032	$0	$1,032	$0	**$1,032.00**	
																													$17,044.00

MAN-HOUR ESTIMATE - "M" AND "N" STREET, 7TH TO 10TH STREET ADDITIONAL SERVICES

Task No.	Description of Work Items / Tasks	Principal	PM	Sr Eng	Traffic	STR Eng	PE	PE	ST	D2	CLER	OATr	OAR	PI Coord	GR. DES.	ILL	WM / DD	RLS	RLS	IO	SCM	Srvy Tech	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
18	**QA/QC**																												
	Plan Review	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	$644	$0	$644	$0	**$644.00**	
	OA Traffic Signal Review	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	OA Roadway Review	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
																													$644.00
19	**Permit Applications**																												
	404 Permit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Floodplain Permit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	SWPPP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	NPDES Permit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Railroad Permit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Railroad Agreement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Railroad Insurance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	NDOR Use of Right of Way Permit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	NDOR Agreement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Lancaster County Utility Permit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Lancaster County Inter-local Agreement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Nebraska Dept. of Environmental Quality	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	City/County Health Dept. Noise Permit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
																													$0.00
20	**PS&E Submittals**																												
	Draft PS&E Submittal	0	1	8	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	17	$2,257	$0	$2,257	$0	**$2,257.00**	
	Final PS&E Submittal	0	1	8	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	17	$2,257	$0	$2,257	$0	**$2,257.00**	
																													$4,514.00
21	**Bidding Phase**																												
	Attend Pre-Bid Meeting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Answer Design Questions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Prepare Addenda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
																													$0.00
22	**Construction Phase**																												
	Attend Pre-Construction Meeting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Review Shop Drawings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Prepare Change Orders	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Prepare Revision Sheets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Answer Design Questions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Evaluate substitute "or equal" bids	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Conduct Site Visits	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
	Review and Certify Pay Requests	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	**$0.00**	
																													$0.00
	Total Manhours	0	19	103	56	0	110	9	62	100	0	0	0	0	0	0	0	0	12	16	0	4	491						
	Total	$0	$3,059	$16,583	$7,840	$0	$10,670	$945	$6,510	$7,600	$0	$0	$0	$0	$0	$0	$0	$0	$924	$816	$0	$0	$54,947	$54,947	$0	$54,947	$0	**$54,947.00**	
	Total Labor, OH & Profit	$0	$3,059	$16,583	$7,840	$0	$10,670	$945	$6,510	$7,600	$0	$0	$0	$0	$0	$0	$0	$0	$924	$816	$0	$0						**$54,947.00**	

APPENDIX A-13
Scope of Services

HAYMARKET INFRASTRUCTURE PROJECT
ITS & DYNAMIC MESSAGE SIGNS

JPA Project Number 870951

General Description of Scope of Services

This scope of services generally includes services related to the Intelligent Transportation Systems (ITS) design for the Haymarket Arena event traffic and parking management. This would include preliminary and final design of communications conduit, fiber design including splicing and termination details, signal integration, dynamic message signs (DMS), CCTV cameras, WiFi design, parking management system software development and design, traffic management control room design, dynamic lane utilization signs and reversible lane signals, wayfinding signage design. As part of the work, a study of potential future ITS technologies will be completed and presented to the JPA to evaluate possible infrastructure additions that would allow implementation of "state of the art" technologies and sustainable practices into the future.

The following are the task items that are included as part of the scope of services for the ITS & DMS Message Signs.

Task 1. Project Management

a. *Maintain Schedule and Invoicing*

The Design Team Project Manager will serve as point of contact, maintain project schedule and budget, and be responsible for coordinating work of the design team for this project. This work will include providing regular progress reports to support invoicing and updates on design schedule. Project Management efforts will follow appropriate guidance as given in the City of Lincoln's website "Guiding Principles and Procedures (GP&P)".

b. *Coordination with Others*

The Design Team will coordinate their design with agencies and/or Consultants that are involved with this project or adjacent projects. Coordination includes group or one-on-one meetings with the agencies or Consultants. This includes coordination with the following:

- City of Lincoln Public Works & Utilities Department
  - Engineering Services
  - StarTran
- Nebraska Department of Roads
- City of Lincoln, Urban Development Department
  - Parking Services
- City of Lincoln-Lancaster Planning Department
  - Zoning, Subdivision & Design Standards
- City of Lincoln Police Department
- University of Nebraska-Lincoln
- LHIT

c. Investigation of Future Technologies

There have been significant advances in ITS technology over the past ten years. This trend is expected to continue well into the future and should be accounted for, to the extent possible, in the West Haymarket Arena ITS design. A study of potential future ITS technologies will be completed and presented to the JPA with this project. Although the future technologies may not be available or fiscally achievable at this time, the ITS component design will allow for implementation of future "state of the art" technologies and sustainable practices where possible.

Task 2. General Project Meetings

a. Kick-Off Meeting

Once notice to proceed has been received, the Design Team Project Manager and Design Team Lead Designer will schedule and attend a kick-off meeting with the Program Manager, JPA staff and utilities for the project. The JPA Project Management Team will supply a list of invitees and the Design Team shall be responsible for notification to attendees.

b. Progress Meetings

The Design Team Project Manager and appropriate design staff will schedule and attend progress meetings for this individual project. The Design Team will create and distribute a meeting agenda at least 48 hours prior to all progress meetings. This scope estimates five (5) progress meetings.

c. Review Meetings

The Design Team Project Manager will schedule and attend review meetings with the Design Team Lead Designer to receive the JPA's review comments from the first and second submittals.

d. Plan-in-Hand

The Design Team will schedule and attend a plan-in-hand meeting. This meeting is to be held following the review period of the first submittal.

TASK 3. Survey

a. Supplemental Topographic Survey

The JPA has provided survey information through a separate consultant. Additionally, supplemental survey for individual projects has been completed. Additional topographic survey work will be required for all eleven (11) proposed DMS Sign locations as they are in areas outside of where topographic survey has been collected. Supplemental survey may also be required at potential CCTV camera pole and reversible lane signalization locations but is not included with this scope. The Design Team will perform the necessary additional field survey work. This will include utility locations not included with the original survey, topographic features not included with the initial survey and hard elevations at other critical locations as determined during the design process.

TASK 4. Utility Coordination

a. Utility Location/Verification

The Design Team will review the utility locations shown on both the supplemental survey and the survey provided by the JPA, and verify these locations during field inspections. Plans will be printed and distributed to the Utility Companies for verification of ownership, type, size, location, and cased or uncased.

The Design Team will request that the Utility Companies return to the Design Team marked up plans with utility verification. The Design Team will incorporate the information into the topography. All utilities identified in the topographic survey and verified by the individual utility will be incorporated into the plans. It is assumed the survey accurately depicts the existing utilities in the project area and this scope item is for confirmation of the utility locations.

The Design Team shall identify and verify with Utility Companies major utility conflicts such as fiber optic lines, gas pipelines, crude oil pipelines, high-pressure waterlines, transmission lines, etc., at the earliest possible time. The Design Team, Program Manager and the JPA Project Management Team will discuss major conflicts and attempt to avoid them. If avoidance is not possible, the Design Team will then request the Utility Company to verify the conflict and provide a preliminary estimate of reimbursable costs associated with the utility relocation. The Design Team will work with the affected Utility Companies to determine the best strategies for relocations and potential mitigation strategies that may be implemented to ensure that the project schedule is not adversely impacted.

b. Utility Plan Submittal

At each JPA review submittal, the plans will be distributed by the Design Team to public and private utilities for comment.

c. Utility Review Meetings/Coordination

The Design Team shall schedule utility review meetings to coincide with a regular project progress meeting or JPA review meeting. The Design Team shall include time for coordination via the phone and one-on-one meetings with affected utilities as necessary to maintain the accelerated schedule for the design and construction of the project.

TASK 5. WiFi Design

a. Network Planning

The Design Team will perform a detailed analysis of the desired wireless coverage area to identify the specific design characteristics and details necessary to perform the network planning portion of this task. Characteristics of the coverage area such as existing and planned structures that could serve as antenna mounting locations or as obstacles to antenna locations will be documented and incorporated into the network design. Other design characteristics such as desired network throughput, network security, open public access, VLAN technology, Mesh technology, antenna technology and spectrum availability will all be analyzed and incorporated into the network planning. As part of the network planning an RF sweep will be performed in the wireless coverage area to identify potential sources of RF interference so that mitigation of any potential interference can be incorporated into the design of the network.

This task will include up to (2) field visits to identify the physical design characteristics of the wireless coverage area, identify potential antenna mounting locations and power sources and to perform an RF sweep.

b. Backhaul Design

The Design Team will assess the overall desired network reliability and throughput and incorporate these requirements into the design of the wireless network backhaul. It is anticipated that the backhaul design will utilize a combination of wireless backhaul and fiber backhaul to create a robust network while conserving cost. Multiple wireless network backhaul points are desirable to increase network reliability eliminating single points of failure.

This task will include man hours to incorporate the wireless network backhaul design into the overall plan for communications for the project area.

c. Propagation Modeling

In addition to an RF sweep to identify potential sources of RF interference, once a preliminary network design is achieved, a computer generated propagation study will be performed based on the results of the RF sweep, the proposed antenna placements, proposed antenna technology and frequency spectrum to be utilized. This computer generated propagation study will serve to verify the integrity of the wireless network design as it is proposed to service the area desired as the coverage area for the wireless network.

d. RFP Development

As a further product of the wireless network design, the Design Team will develop detailed plans and bid specifications to be utilized in the procurement of the wireless network equipment, installation and any potential maintenance contracts for the network. Included in the detail of this task will be an acceptance test plan to be utilized in the verification of the network installation and coverage area of the wireless network.

Task 6. CCTV Camera Locates

a. Establish CCTV Camera Locations

The Design Team will meet with Engineering Services and NDOR to determine the locations and line of sight for existing City of Lincoln and NDOR CCTV cameras within the study area. This will then be compared to the expected event traffic arrival and departure patterns for the West Haymarket Arena. Based upon this comparison, additional CCTV camera locations will be proposed to provide complete coverage of the West Haymarket site and the major arterials providing access to the site. This task will include preliminary walkdowns of each location to determine the viability of using existing poles or to identify potential new camera pole locations. One (1) meeting with Engineering Services and NDOR is planned as part of this task item. Any additional survey that is needed based on the preliminary location of the camera pole will be completed after this task.

b. Site Walkdowns/Bucket Truck Reviews

Bucket truck reviews will be completed for each proposed camera location to verify camera coverage and the ability to achieve full coverage of the area. If required, the Design Team will review multiple locations at each site. As part of this task CCTV Camera locations will be evaluated to identify potential conflicts with the proposed locations including, but not limited to, sight obstructions, rights-of-way limitations, overhead line obstruction, power limitations, guard rail protection/clear zone requirements and avoidance of wetlands. Any required survey must be received prior to this task being conducted.

c. CCTV Camera Design

All CCTV camera, structure and communication design will occur under tasks 13 – 17 of this scope of services. This scope assumes design of up to eight (8) new CCTV Cameras.

Task 7. DMS Locates

a. Establish DMS Locations

The Design Team will visit the site of each proposed DMS location from the concept planning document and establish preliminary sign and pole locations based on MUTCD guidance, access point locations, visible utilities, sight distance obstructions, view angle and guard rail protection/clear zone requirements. The Design Team will then meet with City of Lincoln staff to present these preliminary DMS locations and coordinate any major location adjustments from the concept planning stage with the Transportation Event Management Plan. These preliminary locations will then be compared to the overall goals of the Transportation Event Management Plan and ITS Concept Plan. Additionally, all locations will be reviewed a final time for applications with other traffic management needs of the City of Lincoln such as UNL football games, downtown Lincoln events, etc. If minor modifications to DMS sign locations can still meet the needs for Haymarket Arena traffic management and these other events the signs locations will be adjusted accordingly. Two (2) meetings with representatives of, but not limited to, City of Lincoln, JPA and NDOR are planned as part of this task item. Once preliminary DMS pole sighting are agreed upon all additional survey will be performed.

b. Site Walkdowns

After survey has been processed, the Design Team will visit the proposed DMS sign locations to identify and address remaining potential conflicts with the proposed locations including, but not limited to rights-of-way limitations, power limitations and avoidance of wetlands. Any sign location changes that occur as part of this task will be presented in the first submittal package. Any required survey must be received prior to this task being conducted.

c. DMS Design

All DMS sign, structure and communication design will occur under tasks 13 – 17 of this scope of services. This scope assumes design of up to eleven (11) new DMS sign locations.

Task 8. Fiber Plan

a. Develop Fiber Plan

Due to its reliability and data transmission capacity, fiber is the preferred form of communications transmission in ITS design. Upon completion of the design memo and meetings with the City of Lincoln, the Design Team will develop a Fiber plan that builds upon the existing City of Lincoln owned fiber and future Fiber master plan. This plan will also rely upon third party fiber sharing agreements currently in place as well as potential new sharing opportunities. The overall goal of the fiber layout that is developed for this project will be to maximize the number of ITS devices (DMS Signs, CCTV Cameras, Traffic Signals, Parking Systems, etc.) that communicate via fiber but are still economically feasible for the project. Also, developing a fiber ring structure that provides a diverse and redundant fiber path to devices, where feasible, should be a goal of the plan.

b. Site Walkdowns

The Design Team will perform walkdowns along all proposed fiber paths to identify potential conflicts with the proposed plan. If opportunities to develop fiber sharing partnerships with public/private entities are identified during walkdowns they will be further pursued under Task 1 of this scope and potentially included in the Fiber Plan.

The Design Team will also document any known public and/or private utility conflicts that may exist in the area. If a potential utility conflict is identified, the Design Team will evaluate possible alternatives to avoid the conflict.

c. Fiber Design

All fiber and communication infrastructure design will occur under tasks 13 – 17 of this scope of services.

Task 9. Traffic Management Control Room Design

As part of the ITS Concept Plan, the desire for a centralized location to manage and control the Haymarket Arena ITS deployments was identified. In meetings with the arena architect, a space was identified in the building layout for a space with this specific use.

This task will include coordinating with the arena architect, arena management team and event staff so that the functional requirements of this room are accounted for in the design of this space. Items that will be addressed include but are not limited to:

- Utility requirements to and within this space (Power, Phone, Comm)
- Overall functional layout
- Specifications and plans for hardware and software not included within tasks 13 – 17 of this scope

Task 10. Parking Management System

a. Coordination with Existing Parking Software

The Design Team will study the Amano McGann parking software currently utilized by the City of Lincoln in parking garages. This software has also been identified for use in the new parking garages proposed south of the Haymarket Arena. The output and communications protocol of this software will be analyzed for incorporation into the central control system in the TMC.

b. Surface Parking Lot Management Design

The Design Team will develop a set of design plans for a parking lot management system. This system once integrated will be able to provide traffic count data at the entrances and exits of all surface parking lots. The design will allow for count data to be collected on a lane by lane basis at all access points and provide information on the level of fill for each lot. The data can be transmitted from cabinets and controllers at each parking lot via fiber and/or radio communications to a master PLC and central control system server in the TMC room in the Arena.

c. Event Traffic and Parking Management Integration Design

The Design Team has the capabilities to integrate software and hardware to support ITS device and communications deployment. This would allow for a fully integrated and automated event traffic and parking management system. This system would allow for DMS sign management surrounding the Haymarket Arena to be automatically controlled by the data received at individual parking lots being monitored around the arena. The result is improved traffic flow with reduced on-street forces due to this smart technology.

This system will allow for parking inventories and occupancies as well as DMS sign messages to be overidden by event management staff supervising the parking management from either by computer in the TMC, remote location, or wirelessly by multiple media devices on-site. These abilities allow for adjustments during all day events, special events, vehicle crashes, etc.

d. RFP Development

As a further product of the parking management design, the Design Team will develop a detailed specifications document along with an RFP to be utilized in the procurement of the parking management system equipment, installation and any potential maintenance contracts for the system. Included in this task will be a factory, subsystem and burn-in period acceptance test plans to be utilized in the verification of the lot count and network communication installation for the parking management system.

All parking management system design and specifications writing will be completed under this task and are not included with tasks 13 – 17.

Task 11. Dynamic Lane Utilization and Reversible Lane Signalization

Through the design process to date for individual projects, locations requiring dynamic lane utilization and reversible lane overhead signalization have been identified. Due to the aggressive schedule of individual design projects and a lack of relevancy of these technologies until the arena is in operation, it was decided that these elements should be incorporated into the ITS design.

Based upon the final recommendations of the Traffic Event Management Plan or as directed by the JPA Project Management Team, the Design Team will prepare signal plans at intersections as warranted. It is estimated that the following location will require design plans to construct these signals:

a. Overhead Dynamic Lane Utilization

- 10th and Salt Creek Roadway Roundabouts for westbound traffic – Two (2) separate overhead dynamic lane utilization signs locations between the east and west roundabout that will be changed during events when two exit lanes onto Arena Drive are required for events.
- Charleston Street between 4th Street and 6th Street – An overhead dynamic lane utilization sign for eastbound traffic on Charleston Street. *If closing of gates to North Bottoms neighborhood is determined to be required for all events this location may be removed.*

b. Reversible Lane Signalization

- 6th Street between Charleston Street and Festival Space Parking Lot – Two (2) separate overhead reversible lanes signal locations will be utilized to maximize capacity of 6th Street for pre- and post-event traffic patterns

All Dynamic Lane Utilization and Reversible Lane Signalization design will occur under tasks 13 – 17 of this scope of services.

Task 12. Wayfinding Signage

Through the Traffic Event Management Plan process the City of Lincoln has expressed interest in a comprehensive static wayfinding sign plan for the Haymarket Arena.

a. Wayfinding Sign Key Destination Identification and Sign Location

The Design Team will coordinate their Haymarket wayfinding design with agencies that are involved with this project or that have interests in downtown Lincoln. Two (2) group meetings are assumed for this task to coordinate with various entities. This includes coordination with the following:

b. Develop Wayfinding Sign Message Sets

Once key destinations have been identified, message sets for each sign will be developed for review and approval of the agencies involved during the identification process. The message set and text size will be reviewed for conformance with the specifications outlined by the City of Lincoln and the Manual on Uniform Traffic Control Devices (MUTCD).

c. Wayfinding Design

All wayfinding sign specifications and design documents will occur under this task. This task assumes design of 25 ground mount signs installations and 5 overhead structure sign installations and corresponds to the locations identified in the ITS concept plan task. This task does not include design of wayfinding signage in the core existing downtown area, core area roadway area (Arena Drive and Canopy Street, etc) or along the festival space roadways. Pedestrian wayfinding signage is also not included with this task.

Task 13. First Submittal

The Design Team will prepare a first submittal construction bid package for the West Haymarket Arena. This submittal package will substantiate that the design is progressing, and that adequate coordination is being provided between the various technical areas. Information submitted with the first submittal shall be sufficient to conduct a constructability "plan-in-hand" walkthrough between the Consultant and JPA.

e. Preliminary Designs

The Design Team shall prepare project base files and plan sheets in accordance with the City of Lincoln CADD standards. Plan sheets to be included in the first submittal include the following:

- Cover Sheet
- General Notes Sheets
- Network Architecture Sheets
- ITS Infrastructure Plan Sheets

This plan set will include the following elements:

- Foundations, poles, mountings, locations and cabinets
- Location and routing of communication infrastructure
- Conduit size and installation

f. Cost Estimates

The Design Team shall prepare a total project cost estimate.

Task 14. Second Submittal

The Design Team will prepare the second submittal package upon review comments and plan changes from the first submittal. Information submitted with the second submittal shall be sufficient to permit bidding and construction of the system.

a. Second Submittal Design

The Design Team shall prepare project base files and plan sheets in accordance with the City of Lincoln CADD standards. All sheets that will be included in the PS&E plan set will be included in the second submittal. This includes, but not limited to, the following sheets:

- Cover Sheet
- Summary of Quantities Sheet
- General Notes Sheets
- Network Architecture Sheets
- ITS Infrastructure Plan Sheets
- Traffic Control Plan Sheets
- Design Detail Sheets
- Splice/Termination Diagrams

b. Cost Estimates

The Design Team shall prepare an updated total project cost estimate.

c. Special Provisions

The Design Team will submit Special Provisions with the second submittal.

Task 15. Quality Assurance / Quality Control (QA / QC)

The Design Team will give a copy of their QA / QC plan to the Program Manager and the JPA Project Management Team at the start of the project. The Design Team will submit in writing that this plan has been used during the project at each submittal with the name of the person responsible for performing the QA / QC aspects.

Task 16. Permit Applications / Agreements

The Design Team shall prepare and submit on behalf of the JPA the following permits, agreements, certifications, and forms. The Design Team shall copy the Program Manager and JPA Project Management Team on all applications being submitted.

- ❑ NDOR Use of Right of Way Permit (if applicable for crossing under I-180)

Task 17. PS&E Submittals

a. Draft PS&E Submittal

The Design Team shall submit a draft PS&E package to the JPA Project Management Team for final review. The package will include the plan set, special provisions, and a total project cost estimate. The Design Team shall prepare an updated total project cost estimate.

b. *Final PS&E Submittal*

Upon incorporating review comments into the plan set and special provisions, the Design Team shall prepare and submit all drawings, special provisions, and an updated total project cost estimate to the JPA Project Management Team for the final PS&E review. Upon JPA acceptance of the PS&E plans, the Design Team shall submit the bid package to the JPA Project Management Team. The bid package includes sealed bond drawings, sealed special provisions, and an electronic file with final bid items and quantities. The bid package will also be accompanied by an electronic copy of the design in MicroStation, GEOPAK format. GEOPAK GPK files will also be submitted.

Task 18. Bidding Phase

a. *Attend Pre-Bid Meeting and answer questions*

b. *Answer Design Questions*

c. *Addenda to be prepared by JPA Purchasing Representatives*

Task 19. Construction Phase

a. *Attend Pre-Construction Meeting*

b. *Review Shop Drawings and material submittals*

c. *Prepare Revision Sheets*

d. *Answer Design Questions and Consultation to clarify plans/specifications*

e. *Evaluate Substitute "or equal" Bids items as requested by the Program Manager*

f. *Conduct Site Visits as requested by the Program Manager*

JPA Responsibilities

The JPA will supply the following information:

- ❑ Copies of available reports/data
- ❑ Current bid item listing

GENERAL INFORMATION

1. PLAN FORMAT

Two Half size (11" x 17") white paper bond copies of the plans will be submitted at the first submittal, second submittal, and draft PS&E submittal. One half size (11" x 17") white paper bond copy of the plans will be submitted for PS&E review. Any material, which does not produce an acceptable reproduction will be returned to the Design Team for rectification. All submittals, except final submittal, shall be bound with post screws or staples. In addition to the paper copies, PDF's of the plans and Special Provisions will be submitted for all reviews.

Final plans will be submitted on 11" x 17" bond paper and will be accompanied by an electronic copy of the design in MicroStation, GEOPAK format. GEOPAK GPK files will also be submitted.

All sheets will be plotted at the City of Lincoln's standard sheet scales.

Care will be exercised in drawing all construction details. All notes will be properly spaced and all lettering will be of an engineering style. Clarity must be maintained to allow the plans to be archived on microfilm; the background topography, grid lines etc. on plan and profile sheets will be removed behind the text.

The Design Team shall follow the City of Lincoln's CADD drafting procedures and guidelines in preparing the plans.

The CADD files will conform to the following standards and conventions. All plans, specifications, and documents will be in English units using the following working units:

a) Master Units = Ft
b) Sub Units = 1000th
c) Position Units = 1

Global origin of the graphics design plane will be located at x= 0.0000, y= 0.0000.

Reports, Studies and Technical Information:

The Design Team shall prepare and submit the following items:

1. Technical memos for all pertinent meetings
2. Meeting minutes from all meetings
3. Miscellaneous correspondence and information related to the project
4. Summary of quantities and opinion of probable cost
5. Permit applications
6. Special Provisions for items not covered by the City of Lincoln Standard Specifications
7. Coordination with Existing Parking Software

Appendix A-13
Total Project Fee

Arena ITS Design
City Project Number 870951

Task No.	Task Description		Fee Estimate
1	Project Management		$32,576.00
2	General Project Meetings		$14,568.00
3	Survey		$19,696.00
4	Utility Coordination		$10,160.00
5	WiFi Design		$41,616.00
6	CCTV Camera Locates		$12,224.00
7	DMS Sign Locates		$13,924.00
8	Fiber Plan		$29,840.00
9	Traffic Management Control Room Design		$19,620.00
10	Parking Management System		$174,236.00
11	Dynamic Lane Utilization and Reversible Lane Signalization		Included in Task 13-17
12	Wayfinding Signage		$44,404.00
13	First Submittal		$77,430.00
14	Second Submittal		$98,258.00
15	Quality Assurance / Quality Control (QA/QC)		$6,096.00
16	Permit Applications / Agreements		$1,364.00
17	PS&E Submittals		$9,780.00
18	Bidding Phase		$7,536.00
19	Construction Phase		$53,968.00
	Expenses		$2,500.00
		Total Project Cost	$669,796.00

PAY RATES (BASED ON HOURLY RATE SCHEDULE PER CLASSIFICATION)

Overhead Rate : 0%

Profit : 0%

Personnel		Total Hr.	Salary $ Per Hr.	Labor Cost	Total Cost
Principal/Project Manager	P/PM	0	$180.00	$0	$0.00
Team Leader	TL	558	$162.00	$90,396	$90,396.00
Group Leader	GL	716	$148.00	$105,968	$105,968.00
Senior Engineer	SE	28	$155.00	$4,340	$4,340.00
Senior Project Engineer	SPE	1228	$142.00	$174,376	$174,376.00
Project Engineer	PE	590	$115.00	$67,850	$67,850.00
Associate Engineer	AE	50	$98.00	$4,900	$4,900.00
Assistant Engineer	ASE	1094	$85.00	$92,990	$92,990.00
Senior Scientist	SS	0	$120.00	$0	$0.00
Senior Project Scientist	SPS	0	$105.00	$0	$0.00
Project Scientist	PS	0	$90.00	$0	$0.00
Associate Scientist	ACS	0	$70.00	$0	$0.00
Assistant Scientist	AS	0	$60.00	$0	$0.00
Surveyor	SM	100	$80.00	$8,000	$8,000.00
Survey Crew Member (CM)	SCM	100	$55.00	$5,500	$5,500.00
Technical Manager	TM	0	$118.00	$0	$0.00
Design Technician	DT	0	$84.00	$0	$0.00
Senior Technician	ST	0	$80.00	$0	$0.00
Technicain	Tech	1576	$71.00	$111,896	$111,896.00
Administrative Coordinator	AC	0	$70.00	$0	$0.00
Administrative Assistant	AA	18	$60.00	$1,080	$1,080.00
Expenses					**$2,500.00**
		6058		**$667,296**	**$669,796.00**

TOTAL EXPENSES					
Expenses	**Amount**		**$ Ea.**		**Cost**
Design					
Travel, mile (car)	500	MILES	0.50		$250.00
Travel, mile (survey vehicle)		MILES	0.68		$0.00
Half Size Plots (each)	2000	L.S.	0.3		$600.00
Mylars, Half Size Plots (each)		EA.	0.3		$0.00
Miscellaneous Expenses(Plots, Copies, Reports, etc.)	1	EA.	1650		$1,650.00
					$0.00
					$0.00
					$0.00
			Sub Total		**$2,500.00**
Survey Expenses					
Public Involvement Expenses					
			Total		**$2,500.00**

MAN-HOUR ESTIMATE - ARENA ITS DESIGN/PROJECT NUMBER 870951

Task No.	Description of Work Items / Tasks	P/PM	TL	GL	SE	SPE	PE	AE	ASE	SS	SPS	PS	ACS	AS	SM	SCM	TM	DT	ST	Tech	AC	AA	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
1	**Project Management**																												
	Maintain Schedule and Invoicing		80																				80	$12,960	$0	$12,960	$0	**$12,960.00**	
	Coordination with Others		40	40		8																	88	$13,536	$0	$13,536	$0	**$13,536.00**	
	Investigation of Future Technologies		20			20																	40	$6,080	$0	$6,080	$0	**$6,080.00**	
																													$32,576.00
2	**General Project Meetings**																												
	Kick-Off Meeting		4	4																			8	$1,240	$0	$1,240	$0	**$1,240.00**	
	Progress Meetings		20	20		20																	60	$9,040	$0	$9,040	$0	**$9,040.00**	
	Review Meetings		8	8																			16	$2,480	$0	$2,480	$0	**$2,480.00**	
	Plan-in-Hand		4	4		4																	12	$1,808	$0	$1,808	$0	**$1,808.00**	
																													$14,568.00
3	**Survey**																												
	Topographical Survery		8					50							100	100							258	$19,696	$0	$19,696	$0	**$19,696.00**	
																													$19,696.00
4	**Utility Coordination**																												
	Utility Location/Verification			8					8											8			24	$2,432	$0	$2,432	$0	**$2,432.00**	
	Utility Plan Submittal								8											8			16	$1,248	$0	$1,248	$0	**$1,248.00**	
	Utility Review Meetings/Coordination			20		20			8														48	$6,480	$0	$6,480	$0	**$6,480.00**	
																													$10,160.00
5	**WiFi Design**																												
	Network Planning		20			100																	120	$17,440	$0	$17,440	$0	**$17,440.00**	
	Backhaul Design		8			40														40			88	$9,816	$0	$9,816	$0	**$9,816.00**	
	Propagation Modeling					20																	20	$2,840	$0	$2,840	$0	**$2,840.00**	
	RFP Development		8			72																	80	$11,520	$0	$11,520	$0	**$11,520.00**	
																													$41,616.00
6	**CCTV Camera Locates**																												
	Establish CCTV Camera Locations		4	4		12	12													20			52	$5,744	$0	$5,744	$0	**$5,744.00**	
	Site Walkdowns/Bucket Truck Reviews			16		16	16																48	$6,480	$0	$6,480	$0	**$6,480.00**	
																													$12,224.00
7	**DMS Locates**																												
	Establish DMS Locations		4	8		20	20													40			92	$9,812	$0	$9,812	$0	**$9,812.00**	
	Site Walkdowns					16	16																32	$4,112	$0	$4,112	$0	**$4,112.00**	
																													$13,924.00
8	**Fiber Plan**																												
	Develop Fiber Plan		40	40		40														40			160	$20,920	$0	$20,920	$0	**$20,920.00**	
	Site Walkdowns			20		20			20											20			80	$8,920	$0	$8,920	$0	**$8,920.00**	
																													$29,840.00
9	**Traffic Management Control Room Design**																												
	Traffic Management Control Room Design		30			40			40											80			190	$19,620	$0	$19,620	$0	**$19,620.00**	
																													$19,620.00
10	**Parking Management System**																												
	Coordination with Existing Parking Software		4						20											8			32	$2,916	$0	$2,916	$0	**$2,916.00**	
	Surface Parking Lot Management Design		40	160		40			160											160			560	$60,800	$0	$60,800	$0	**$60,800.00**	
	Event Traffic and Parking Management Integration Design		80	80		160			240											200			760	$82,120	$0	$82,120	$0	**$82,120.00**	
	RFP Development		80	20		40			80														220	$28,400	$0	$28,400	$0	**$28,400.00**	
																													$174,236.00
11	**Dynamic Lane Utilization and Reversible Lane Signalization**																												
																													$0.00
12	**Wayfinding Signage**																												
	Wayfinding Sign Key Destination Identification and Sign Location			8	8																		16	$2,424	$0	$2,424	$0	**$2,424.00**	
	Develop Wayfinding Sign Message Sets			20	20				80											40			160	$15,700	$0	$15,700	$0	**$15,700.00**	
	Wayfinding Design			20			40		120											120			300	$26,280	$0	$26,280	$0	**$26,280.00**	
																													$44,404.00
13	**First Submittal**																												
	Preliminary Designs																												
	Cover Sheet						2													4			6	$514	$0	$514	$0	**$514.00**	
	General Notes Sheets						4													8			12	$1,028	$0	$1,028	$0	**$1,028.00**	
	Network Architecture Sheets		2			40	20													40			102	$11,144	$0	$11,144	$0	**$11,144.00**	
	ITS Infrastructure Plan Sheets		4	40		40	120		160											320			684	$62,368	$0	$62,368	$0	**$62,368.00**	
	Cost Estimates		4	4		8																	16	$2,376	$0	$2,376	$0	**$2,376.00**	
																													$77,430.00
14	**Second Submittal**																												
	Second Submittal Design																												
	Cover Sheet																			2			2	$142	$0	$142	$0	**$142.00**	
	Summary of Quantities Sheet						8		20											40			68	$5,460	$0	$5,460	$0	**$5,460.00**	
	General Notes Sheet								2											2			4	$312	$0	$312	$0	**$312.00**	
	Network Architecture Sheets					8			8											20			36	$3,236	$0	$3,236	$0	**$3,236.00**	
	ITS Infrastructure Plan Sheets		4	40		40	80		80											160			404	$39,608	$0	$39,608	$0	**$39,608.00**	
	Traffic Control Plan Sheets						16													16			32	$2,976	$0	$2,976	$0	**$2,976.00**	
	Design Detail Sheets					40	40													40			120	$13,120	$0	$13,120	$0	**$13,120.00**	

MAN-HOUR ESTIMATE - ARENA ITS DESIGN/PROJECT NUMBER 870951

Task No.	Description of Work Items / Tasks	P/PM	TL	GL	SE	SPE	PE	AE	ASE	SS	SPS	PS	ACS	AS	SM	SCM	TM	DT	ST	Tech	AC	AA	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
	Splice/Termination Diagrams					80			40											40			160	$17,600	$0	$17,600	$0	**$17,600.00**	
	Cost Estimates		4	8		8																	20	$2,968	$0	$2,968	$0	**$2,968.00**	
	Special Provisions		8	40		20	20															8	96	$12,836	$0	$12,836	$0	**$12,836.00**	
																													$98,258.00
15	**QA/QC**																												
	Plan Review		16	16		8																	40	$6,096	$0	$6,096	$0	**$6,096.00**	
																													$6,096.00
16	**Permit Applications/Agreements**																												
	NDOR Use of Right of Way Permit		2				8															2	12	$1,364	$0	$1,364	$0	**$1,364.00**	
																													$1,364.00
17	**PS&E Submittals**																												
	Draft PS&E Submittal						40													40			80	$7,440	$0	$7,440	$0	**$7,440.00**	
	Final PS&E Submittal						8													20			28	$2,340	$0	$2,340	$0	**$2,340.00**	
																													$9,780.00
18	**Bidding Phase**																												
	Attend Pre-Bid Meeting		4	4		4																	12	$1,808	$0	$1,808	$0	**$1,808.00**	
	Answer Design Questions					16	8																24	$3,192	$0	$3,192	$0	**$3,192.00**	
	Prepare Addenda					8	8															8	24	$2,536	$0	$2,536	$0	**$2,536.00**	
																													$7,536.00
19	**Construction Phase**																												
	Attend Pre-Construction Meeting		4	4		4																	12	$1,808	$0	$1,808	$0	**$1,808.00**	
	Review Shop Drawings and material submittals			20		20	8																48	$6,720	$0	$6,720	$0	**$6,720.00**	
	Prepare Revision Sheets					20	40													40			100	$10,280	$0	$10,280	$0	**$10,280.00**	
	Answer Design Questions			16		20	20																56	$7,508	$0	$7,508	$0	**$7,508.00**	
	Evaluate substitute "or equal" bids		4	4		16	16																40	$5,352	$0	$5,352	$0	**$5,352.00**	
	Conduct Site Visits (6 visits)			20		40	20																80	$10,940	$0	$10,940	$0	**$10,940.00**	
	OTDR Trace Review					80																	80	$11,360	$0	$11,360	$0	**$11,360.00**	
																													$53,968.00
	Total Manhours	0	558	716	28	1228	590	50	1094	0	0	0	0	0	100	100	0	0	0	1576	0	18	6058						
	Total	$0	$90,396	$105,968	$4,340	$174,376	$67,850	$4,900	$92,990	$0	$0	$0	$0	$0	$8,000	$5,500	$0	$0	$0	$111,896	$0	$1,080	$667,296	$667,296	$0	$667,296	$0	**$667,296.00**	
	Total Labor, OH & Profit	$0	$90,396	$105,968	$4,340	$174,376	$67,850	$4,900	$92,990	$0	$0	$0	$0	$0	$8,000	$5,500	$0	$0	$0	$111,896	$0	$1,080						**$667,296.00**	

APPENDIX A-18
Scope of Services

HAYMARKET INFRASTRUCTURE PROJECT
PARKING DECK #2
PARTIAL DESIGN TO CO-LOCATE DEC AND DECK #2 ON SAME SITE

JPA Project Number TBD

General Description of Scope of Services

This scope of services generally includes services related to the partial design of Parking Deck #2. Deck #2 is to be collocated on the site between "Q & P" streets and between the "Arena Drive and the alley", with the proposed District Energy Center (DEC). This contact is only for a partial design of the Deck #2. Davis Design is to provide the work necessary to design Deck #2 to a point at which all of the main parameters of the garage design are determined, and that a common footing and wall between the Deck #2 and the DEC can be designed. This design includes investigation of design items that may be encountered due to the two projects being Co-Located on one site. This garage is located directly south of the Deck #1 and will be approximately 700 stalls. The parking deck is an "Event" garage and will be designed to accommodate the rapid loading and unloading of the vehicles during an event. The design of the garage will include design collaboration with the arena architect as well as coordination with the architect for the adjacent development directly to the east of the Deck #2/DEC site. Davis Design has included the fees for AGA Consulting Inc., to provide functional design, traffic flow, ticket booths, and other design and quality control items. AGA's fees also reflect only the design necessary to complete the task as outlined above. Pictoform will be required to complete the design of the Deck #2, but is not included in this task. This garage is to be similar in appearance to the Deck #1 as noted in task order A-17 also bing designed by Davis Design. LHIT team will coordinate all issues with respect to the ITS, traffic studies, traffic flows to accommodate event parking, these items do not include a complete design. Only the required work to complete the task will be supplied. LHIT will coordinate issues with the DEC project.

It is understood that this contract is only for the partial design of the Deck #2 to enable the Co-Location of the DEC on the same site. The complete design will be completed by the LHIT/Davis Design under a future contract or change order.

The following are the task items that are included as part of the scope of services for the South Parking Garage.

Task 1. Project Management

a. *Project Management*

The Design Team Project Manager will serve as point of contact, maintain project schedule and budget, and be responsible for coordinating work of the design team for this project. This work will include providing regular progress reports to support invoicing and updates on design schedule. Project Management efforts will follow appropriate guidance as given in the City of Lincoln's website "Guiding Principles and Procedures (GP&P)".

b. *Coordination with Others*

The Design Team will coordinate their design with agencies and/or Consultants that are involved with this project or adjacent projects. Coordination includes one-on-one meetings with the agencies or Consultants. This work item does not include coordination with utilities which is

covered in Task 4 of this scope of services. Special care shall be taken to coordinate with the DEC, Arena, retail, housing, and Hotel developments.

c. Design Memorandum

Using the City of Lincoln's design memorandum outline, the Design Team will prepare a design memorandum with project criteria and design standard information for submittal and agreement by the Program Manager and the JPA Project Management Team.

d. Condemnation Hearings

Not Required.

Task 2. General Project Meetings

a. Progress Meetings

The Design Team Project Manager and appropriate design staff will schedule and attend progress meetings for this individual project. The Design Team will create and distribute a meeting agenda at least 48 hours prior to all progress meetings. This scope estimates 8 progress meetings.

b. Review Meetings

The Design Team Project Manager will schedule and attend review meetings to receive the JPA's review comments from the first and second submittals.

c. Plan-in-Hand

The Design Team will schedule and attend a plan-in-hand meeting. This meeting is to be held following the review period of the first submittal.

d. Coordination Meetings with ROW Appraisals and Acquisition

Not Required

TASK 3. Survey

Not included.

TASK 4. Utility Coordination

Not Included.

Task 5. Public Involvement

a. One-on-One, Small Group Meetings (2 Meetings)

The Design Team will meet with individuals or key stakeholders who may be significantly affected by the project. This will include one-on-one meetings with representatives of the property owners adjacent to the project, the University of Nebraska and the UNL Alumni Association, Traction Partners, Haymarket design review, and others. The Design Team shall notify the Program Manager of all proposed stakeholder meetings and invite the Program Manager to the meetings.

Task 6. Drainage Analysis

Not Included.

Task 7. Traffic Control and ITS

Not Included.

Task 8. First Submittal

a. Site Inspections (As Required)

- *The site is set to be a "Ready Pad Site" under Task A-4.*

b. Prepare Alternatives

The Design Team will evaluate possible alternatives for design of the parking deck including. Design alternatives will include all traffic flow, parking, structural, lighting, pedestrian traffic, safety, connectivity to the arena, connectivity to the hotel, etc.

This work shall also include development of conceptual plans and cost estimates for a 700 stall parking deck that is designed to serve as an "Event Parking Facility".

The design assumes a precast concrete structure will be used for the facility. In the event an alternate structural system is used, additional design fees may be required in addition to this contract. Please note that only the required design will be done to complete the task of a shared wall and footing. The complete design will be provided under an alternate contract.

c. Preliminary Designs

The Design Team shall prepare project base files and plan sheets in accordance with the City of Lincoln CADD standards. The first submittal will indicate the garage design at approximately 30% complete. Plan sheets to be included in the first submittal include the following:

- Cover Sheet
- Site Layout and Traffic Patterns
- Grading and Utility Sheets
- Floor Plans that indicate general traffic/pedestrian/and egress systems.
- Elevation sheets indicating garage façade.
- Preliminary structural system, Study aspects of a deep foundation system.
- Preliminary Layout of Precast Concrete Structure.
- Preliminary system identification for Mechanical and Electrical systems.

Preliminary Construction Phasing

The Design Team shall prepare a written description of a proposed Construction Phasing, noting detour routes if applicable. This phasing plan shall be submitted at the time of the first submittal.

d. Cost Estimates

The Design Team shall prepare an updated total project cost estimate. This shall include Construction Costs, Garage specific Utilities, Green design aspects, and Construction Engineering and site material testing.

e. Sustainable Design

The Design Team will employ when feasible Sustainable design issues within the project. These may include but are not limited to local materials and suppliers, photovoltaics for lighting, and other materials related issues. The parking deck is not to be design to be LEED certified. We have not included the use of a "Green Roof". Use of intense Sustainable techniques or providing for LEED certification of the building will require additional effort and design fees.

Task 9. Geotechnical Evaluation

A geotechnical investigation and report will be prepared for the project for use in the design of the future parking garage foundations and the joint foundation between the new District Energy Corporation plant and the parking garage. A detailed proposal for the geotechnical investigation and report is attached to this appendix.

Task 10. Environmental / Historical Review

Environmental or Historic Review work is not included as part of this Project.

Task 11. Existing Water Main or Wastewater Relocation

Not Included.

Task 12. Future Parking & Connectivity Structures

a. Structural System of the Parking Garage

It is understood that the design of the structural system for the garage and the connection structure is to be completed by Davis Design under a future contart or change order to this contract. This proposal assumes the parking deck and the connection structure will utilize a Precast Concrete system. In the event an alternate structural system is used, additional design fees will be required. The structural design will include all members of the structure including stair/elevator towers; general structure, lateral loading members, etc.

(all design to be completed as required to assure the Co-Location process with the DEC)

b. Connectivity to Hotel and Other Development:

The South Parking Deck will need to coordinate an elevator/stair/connectivity tower and bridge into the parking deck facility. Davis Design has included coordination issues with the hotel architect and developer. This development is to be located on the East side of the Deck #2 and will connect by means of future walkways/bridges. The bridges are not part of this contract. The stair and elevator towers will be designed to be able to connect to future development.

c. Connectivity to Future Parking Deck to the North (Parking Deck #1):

There are no current plans to connect the parking decks, and no connections are included in the design fees.

Task 13. Water Main Design

Not Included.

Task 14. Wastewater Design

Not Included.

Task 15. Right-of-Way

Not included.

Task 16. Streetscape and Landscape Design

a. Coordination with Project Streetscape Design

The design team will coordinate with the streetscape design that is being completed under task A-7.

b. Landscape Design

The design team will coordinate with the landscape design that is being completed under task A-7.

(all design to be completed as required to assure the Co-Location process with the DEC)

Task 17. Second Submittal

a. Second Submittal Design

The Design Team shall prepare project base files and plan sheets in accordance with the City of Lincoln CADD standards. All sheets that will be included in the final plan set will be included in the second submittal. This includes, but not limited to, the following sheets:

- Cover Sheet
- Site Grading plan
- Site Construction Plan (Utilities, Roads, etc.)
- Geometric Plan of the garage.
- Architectural Floor Plans
- Architectural Elevations
- Architectural Cross Sections
- Architectural Details
- Finish and Door Schedules
- Structural Foundation Plans
- Structural Framing Plans
- Structural Details and General notes
- Pluming Plans
- Sprinkler System
- HVAC Plans
- Electrical Lighting and Power Plans
- Traffic Control Equipment
- Signage Equipment and Location Plans
- Specification Book

(all design to be completed as required to assure the Co-Location process with the DEC)

b. Cost Estimates

The Design Team shall prepare an updated total project cost estimate. This shall include, the total project including all items noted above in the finished plans.

c. Special Provisions

The Design Team will submit Special Provisions with the second submittal if required.

Task 18. Quality Assurance / Quality Control (QA / QC)

The Design Team will give a copy of their QA / QC plan to the Program Manager and the JPA Project Management Team at the start of the project. The Design Team will submit in writing that this plan has been used during the project at each submittal with the name of the person responsible for performing the QA / QC aspects. The hours associated with the QA/QC process is included with the work effort shown for the first and second submittals.

(all design to be completed as required to assure the Co-Location process with the DEC)

Task 19. Permit Applications / Agreements

Not Included.

Task 20. PS&E Submittals

Not Included.

Appendix A-18
Total Project Fee (Includes Subconsultants)

Parking Garage No. 2 - Partial Design to Co-Locate With DEC
JPA Project Number

Task No.	Task Description		Fee Estimate
1	Project Management		$12,960.00
2	General Project Meetings		$972.00
3	Survey		$0.00
4	Utility Coordination		$0.00
5	Public Involvement		$0.00
6	Drainage Analysis		$0.00
7	Traffic		$0.00
8	First Submittal		$0.00
9	Geotechnical Evaluation		$0.00
10	Environmental / Historical Review		$0.00
11	Exist Water - Sanitary Relocates		$0.00
12	Structural / Bridge Design		$0.00
13	Water Main Design		$0.00
14	Wastewater Design		$0.00
15	Right-of-Way		$0.00
16	Landscape Design		$0.00
17	Second Submittal		$0.00
18	QA/QC		$0.00
19	Permit Applications		$0.00
20	PS&E Submittals		$0.00
21	Bidding Phase		$0.00
22	Construction Phase		$0.00
	Expenses (Includes Subconsultant)		$393,460.00
		Total Project Cost	$407,392.00

OA PAY RATES (BASED ON HOURLY RATE SCHEDULE PER CLASSIFICATION)

Overhead Rate : 0%

Profit : 0%

Personnel		Total Hr.	Salary $ Per Hr.	Labor Cost	Total Cost
Principal/Project Manager	P/PM	0	$180.00	$0	$0.00
Team Leader	TL	86	$162.00	$13,932	$13,932.00
Group Leader	GL	0	$148.00	$0	$0.00
Senior Engineer	SE	0	$155.00	$0	$0.00
Senior Project Engineer	SPE	0	$142.00	$0	$0.00
Project Engineer	PE	0	$115.00	$0	$0.00
Associate Engineer	AE	0	$98.00	$0	$0.00
Assistant Engineer	ASE	0	$85.00	$0	$0.00
Senior Scientist	SS	0	$120.00	$0	$0.00
Senior Project Scientist	SPS	0	$105.00	$0	$0.00
Project Scientist	PS	0	$90.00	$0	$0.00
Associate Scientist	ACS	0	$70.00	$0	$0.00
Assistant Scientist	AS	0	$60.00	$0	$0.00
Surveyor	SM	0	$80.00	$0	$0.00
Survey Crew Member (CM)	SCM	0	$55.00	$0	$0.00
Technical Manager	TM	0	$118.00	$0	$0.00
Design Technician	DT	0	$84.00	$0	$0.00
Senior Technician	ST	0	$80.00	$0	$0.00
Technicain	Tech	0	$71.00	$0	$0.00
Administrative Coordinator	AC	0	$70.00	$0	$0.00
Administrative Assistant	AA	0	$60.00	$0	$0.00
Expenses					**$393,460.00**
		86		**$13,932**	**$407,392.00**

TOTAL EXPENSES					
Expenses	**Amount**		**$ Ea.**		**Cost**
Design					
Travel, mile (car)		MILES	0.50		$0.00
Travel, mile (survey vehicle)		MILES	0.68		$0.00
Subconsultant - Davis Design	1	L.S.	372160		$372,160.00
Subconsultant - Alfred Benesch Co. (Geotechnical)	1	L.S.	21000		$21,000.00
Half Size Plots (each)		EA.	0.3		$0.00
Mylars, Half Size Plots (each)		EA.	4.5		$0.00
Aerial Mapping (DTM)		L.S.			$0.00
Miscellaneous Expenses(Plots, Copies, Reports, etc.)	1	L.S.	300		$300.00
Geotechnical Borings and Lab Testing		L.S.			$0.00
			Sub Total		**$393,460.00**
Survey Expenses					
Public Involvement Expenses					
			Total		**$393,460.00**

OA MAN-HOUR ESTIMATE - PARKING GARAGE No. 2, APPENDIX A-18

Task No.	Description of Work Items / Tasks	P/PM	TL	GL	SE	SPE	PE	AE	ASE	SS	SPS	PS	ACS	AS	SM	SCM	TM	DT	ST	Tech	AC	AA	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
1	**Project Management**																												
	Project Management		80																				80	$12,960	$0	$12,960	$0	**$12,960.00**	
																													$12,960.00
2	**General Project Meetings**																												
	Kick-Off Meeting		6																				6	$972	$0	$972	$0	**$972.00**	
																													$972.00
3	**Survey**																												
																													$0.00
4	**Utility Coordination**																												
																													$0.00
5	**Public Involvement**																												
																													$0.00
6	**Drainage Analysis**																												
																													$0.00
7	**Traffic**																												
	Traffic Data Collection																						0	$0	$0	$0	$0	**$0.00**	
	Traffic Analysis																						0	$0	$0	$0	$0	**$0.00**	
	ITS Design With Voice/Data Design																						0	$0	$0	$0	$0	**$0.00**	
	Pavement Marking & Signing																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
8	**First Submittal**																												
																													$0.00
9	**Geotechnical Investigation**																												
																													$0.00
10	**Environmental/Historical Review**																												
																													$0.00
11	**Water Main/Wastewater Relocation**																												
																													$0.00
12	**Structural Design**																												
																													$0.00
13	**Water Main Design**																												
																													$0.00
14	**Wastewater Design**																												
																													$0.00
15	**Right-of-Way**																												
																													$0.00
16	**Landscape Design**																												
																													$0.00
17	**Second Submittal**																												
																													$0.00
18	**QA/QC**																												
																													$0.00
19	**Permit Applications**																												
	404 Permit/ Section 106 coordination																						0	$0	$0	$0	$0	**$0.00**	
	Floodplain Permit																						0	$0	$0	$0	$0	**$0.00**	
	SWPPP																						0	$0	$0	$0	$0	**$0.00**	
	NPDES Permit																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
20	**PS&E Submittals**																												
																													$0.00
21	**Bidding Phase**																												
																													$0.00

OA MAN-HOUR ESTIMATE - PARKING GARAGE No. 2, APPENDIX A-18

Task No.	Description of Work Items / Tasks	P/PM	TL	GL	SE	SPE	PE	AE	ASE	SS	SPS	PS	ACS	AS	SM	SCM	TM	DT	ST	Tech	AC	AA	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
22	**Construction Phase**																												
																													$0.00
	Total Manhours	0	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86						
	Total	$0	$13,932	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$13,932	$13,932	$0	$13,932	$0	**$13,932.00**	
	Total Labor, OH & Profit	$0	$13,932	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0						**$13,932.00**	

Appendix A-18
Davis Design Total Fee

Parking Deck #2 - Partial Design to Co-Locate With District Energy Center

Task No.	Task Description		Fee Estimate
1	Project Management		$17,240.00
2	General Project Meetings		$26,620.00
3	Survey		$0.00
4	Utility Coordination		$0.00
5	Public Involvement		$10,380.00
6	Drainage Analysis		$0.00
7	Traffic Control & ITS		$0.00
8	First Submittal		$149,800.00
9	Geotechnical Investigation		$0.00
10	Environmental/Historical Review		$0.00
11	Water Main/Wastewater Relocation		$0.00
12	Future Parking & Connectivity Structures		$9,940.00
13	Water Main Design		$0.00
14	Wastewater Design		$0.00
15	Right-of-Way		$0.00
16	Landscape Design		$0.00
17	Second Submittal		$130,180.00
18	QA/QC		$0.00
19	Permit Applications		$0.00
20	PS&E Submittals		$0.00
21	Bidding Phase		$0.00
22	Construction Phase		$0.00
	Expenses		$28,000.00
		Total Project Cost	**$372,160.00**

Note: 1. The fees above are for a Precast Concrete Parking Structure. In the event an alternate structural system is used, additional design fees may be required.

Project Construction Costs	$9,800,000	(estimate of $1400/stall)
Fee Total, Including Expenses, Partial Design	$372,160	
Fee % of Construction	3.80%	

PAY RATES (BASED ON HOURLY RATE SCHEDULE PER CLASSIFICATION)

(Task A-17, Admendment #1 - DEC and Deck #2 Co-Located)

Overhead Rate : **0%**

Profit : **0%**

Personnel		Total Hr.	Salary $ Per Hr.	Labor Cost	Total Cost
Principal In Charge/Project Manager	PIC/PM	588	$160.00	$94,080	$94,080.00
Project Architect	Proj Arch	528	$115.00	$60,720	$60,720.00
CADD Technitian, Architectural	AT	508	$80.00	$40,640	$40,640.00
Architectural Designer	AD	480	$85.00	$40,800	$40,800.00
Structural Engineer	SE	240	$135.00	$32,400	$32,400.00
Strictiral Designer	SD	280	$85.00	$23,800	$23,800.00
Mechanical Engineer	ME	100	$135.00	$13,500	$13,500.00
Mechanical Designer	MD	32	$85.00	$2,720	$2,720.00
Electrical Engineer	EE	68	$135.00	$9,180	$9,180.00
Electrical Designer	ED	16	$85.00	$1,360	$1,360.00
Interior Designer	ID	0	$80.00	$0	$0.00
Administrative	ADMIN	40	$60.00	$2,400	$2,400.00
Construction Administration	CA	0	$95.00	$0	$0.00
Sinclair Hille - Design Achitect - Principal	SHA-Arch	136	$135.00	$18,360	$18,360.00
Sinclaire Hille - CADD Tech	SHA-CADD	60	$70.00	$4,200	$4,200.00
		0	$118.00	$0	$0.00
		0	$84.00	$0	$0.00
		0	$80.00	$0	$0.00
		0	$71.00	$0	$0.00
		0	$70.00	$0	$0.00
		0	$60.00	$0	$0.00
Expenses					**$28,000.00**
		3,076		**$344,160**	**$372,160.00**

TOTAL EXPENSES - Appendix A-18					
Expenses	**Amount**		**$ Ea.**		**Cost**
Design					
Parking Consultant, AGA, Functional Design Services	1	L.S.	$18,000		$18,000.00
Travel, mileage, Expenses, AGA only	1	L.S.	$5,000		$5,000.00
Signage Consultant, Pictoform, Signage Design	1	L.S.	$0		$0.00
Travel, mileage, Expenses, Signage Consultant only	1	L.S.	$0		$0.00
Misc Office Printing Expenses (bid sets not included)	1	L.S.	$5,000		$5,000.00
		L.S.	$10,000		$0.00
		L.S.	$25,000		$0.00
		L.S.			
Aerial Mapping (DTM)		L.S.			$0.00
		L.S.	$0		$0.00
Geotechnical Borings and Report		L.S.			$0.00
			Sub Total		**$28,000.00**
Survey Expenses					
Public Involvement Expenses					
			Total		**$28,000.00**

MAN-HOUR ESTIMATE - Appendix A-18, Parking Deck #2- Partial Design Fees To Co-Locate DEC and Deck #2 on Same Site

No.	Description of Work Items / Tasks	PIC/PM	Proj Arch	AT	AD	SE	SD	ME	MD	EE	ED	ID	ADMIN	CA	SHA-Arch	SHA-CADD	0	0	0	0	0	0	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
1	**Project Management**																												
	Kick Off Meeting	6	4					4		4			16		4								38	$4,000	$0	$4,000	$0	**$4,000.00**	
	Project Management	60																					60	$9,600	$0	$9,600	$0	**$9,600.00**	
	Coordination with Others	16													8								24	$3,640	$0	$3,640	$0	**$3,640.00**	
	Design Memorandum																						0	$0	$0	$0	$0	**$0.00**	
	Condemnation Hearings																												
																													$17,240.00
2	**General Project Meetings**																												
	Progress Meetings (8 Meetings)	24	32					8		8					2								74	$9,950	$0	$9,950	$0	**$9,950.00**	
	Review Meetings	8	8					4		4					2								26	$3,550	$0	$3,550	$0	**$3,550.00**	
	Plan-in-Hand	0	0					0		0													0	$0	$0	$0	$0	**$0.00**	
	Coordination Mtntgs, Arena, Traction Partners, DEC	32	32					8		8					16								96	$13,120	$0	$13,120	$0	**$13,120.00**	
																													$26,620.00
3	**Survey**																												
	Topographical Survey																						0	$0	$0	$0	$0	**$0.00**	
	Base Map Preparation																						0	$0	$0	$0	$0	**$0.00**	
	Horizontal Control																						0	$0	$0	$0	$0	**$0.00**	
	Vertical Control																						0	$0	$0	$0	$0	**$0.00**	
	Locate Section Corners																						0	$0	$0	$0	$0	**$0.00**	
	Bench Level Run																						0	$0	$0	$0	$0	**$0.00**	
	Utility Locates																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
4	**Utility Coordination**																												
	Utility Location / Verification																						0	$0	$0	$0	$0	**$0.00**	
	Utility Plan Submittal																						0	$0	$0	$0	$0	**$0.00**	
	Utility Review Meetings / Coordination																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
5	**Public Involvement**																												
	Public Involvement Planning Meetings	4	4												8								16	$2,180	$0	$2,180	$0	**$2,180.00**	
	Public Involvement Plan			4																			4	$320	$0	$320	$0	**$320.00**	
	Database Development/Maintenance																						0	$0	$0	$0	$0	**$0.00**	
	Key Stakeholder Outreach	8	8																				16	$2,200	$0	$2,200	$0	**$2,200.00**	
	City Council Meetings																						0	$0	$0	$0	$0	**$0.00**	
	Open House (2)	8	8																				16	$2,200	$0	$2,200	$0	**$2,200.00**	
	One-on-One Small Group Meetings	8	8																				16	$2,200	$0	$2,200	$0	**$2,200.00**	
	Newletters/Infrmation Materials	8																					8	$1,280	$0	$1,280	$0	**$1,280.00**	
	Web Site Development																						0	$0	$0	$0	$0	**$0.00**	
	Final PI Report/Documentation																						0	$0	$0	$0	$0	**$0.00**	
																													$10,380.00
6	**Drainage Analysis**																												
	Hydraulic / Hydrologic Analysis																						0	$0	$0	$0	$0	**$0.00**	
	Floodplain Study																						0	$0	$0	$0	$0	**$0.00**	
	Preliminary Drainage Studies																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
7	**Traffic Control & ITS**																												
	Traffic Data Collection																						0	$0	$0	$0	$0	**$0.00**	
	Traffic Analysis																						0	$0	$0	$0	$0	**$0.00**	
	Traffic Signal / ITS Design / Street Lighting																						0	$0	$0	$0	$0	**$0.00**	
	Pavement Marking & Signing																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
8	**First Submittal**																												
	Design Alternatives	16	80	120				4		4			24		40	16							304	$30,400	$0	$30,400	$0	**$30,400.00**	
	Preliminary Designs, 30% complete																						0	$0	$0	$0	$0	**$0.00**	
	Work Done Prior To Contract to Co-Locate DEC/Deck #2	60																					60	$9,600	$0	$9,600	$0	**$9,600.00**	
	Civil Grading Plan																						0	$0	$0	$0	$0	**$0.00**	
	Civil Site Plan																						0	$0	$0	$0	$0	**$0.00**	
	Civil Utility Plan																						0	$0	$0	$0	$0	**$0.00**	
	Architectural Sheets	40	140	120	240										8	16							564	$54,700	$0	$54,700	$0	**$54,700.00**	
	Structural Design Sheets, Deep Foundations	32				40	80																152	$17,320	$0	$17,320	$0	**$17,320.00**	
	Structural Design Sheets, 700 Stalls, Precast Structure	24				40	120																184	$19,440	$0	$19,440	$0	**$19,440.00**	
	Mechanical Design Sheets							16	8														24	$2,840	$0	$2,840	$0	**$2,840.00**	
	Plumbing Design Sheets							16	8														24	$2,840	$0	$2,840	$0	**$2,840.00**	
	Electrical Design Sheets									16	8												24	$2,840	$0	$2,840	$0	**$2,840.00**	
	Trafic Control Sheets	2	8																				10	$1,240	$0	$1,240	$0	**$1,240.00**	
	Signage Sheets																						0	$0	$0	$0	$0	**$0.00**	
	ITS sheets																						0	$0	$0	$0	$0	**$0.00**	
	Outline Specification																						0	$0	$0	$0	$0	**$0.00**	
	Preliminary Construction Phasing	4																					4	$640	$0	$640	$0	**$640.00**	
	Cost Estimates	40	4					4		4													52	$7,940	$0	$7,940	$0	**$7,940.00**	
																													$149,800.00
9	**Geotechnical Investigation**																												

MAN-HOUR ESTIMATE - Appendix A-18, Parking Deck #2- Partial Design Fees To Co-Locate DEC and Deck #2 on Same Site

No.	Description of Work Items / Tasks	PIC/PM	Proj Arch	AT	AD	SE	SD	ME	MD	EE	ED	ID	ADMIN	CA	SHA-Arch	SHA-CADD	0	0	0	0	0	0	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
	Data Research																						0	$0	$0	$0	$0	**$0.00**	
	Design Recommendations																						0	$0	$0	$0	$0	**$0.00**	
	Geotechnical Report																						0	$0	$0	$0	$0	**$0.00**	
	Deep Foundation Design Assistance and Pile Tests																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
10	**Environmental/Historical Review**																												
	NEPA Environmental Review																						0	$0	$0	$0	$0	**$0.00**	
	Traffic Noise Study																						0	$0	$0	$0	$0	**$0.00**	
	Hazardous Material Review																						0	$0	$0	$0	$0	**$0.00**	
	Wetlands and Habitat Investigation																						0	$0	$0	$0	$0	**$0.00**	
	Wetland Permitting																						0	$0	$0	$0	$0	**$0.00**	
	Historical / Archeological Investigation																						0	$0	$0	$0	$0	**$0.00**	
	Impacts to Misc. Environmental Resources																						0	$0	$0	$0	$0	**$0.00**	
	Prepare Draft Environmental Review																						0	$0	$0	$0	$0	**$0.00**	
	Endangered Species Review																						0	$0	$0	$0	$0	**$0.00**	
	Public Land Impacts (4F or 6F)																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
11	**Water Main/Wastewater Relocation**																												
	Water Main/Wastewater Relocation																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
12	**Future Parking & Connectivity Structures**																												
	Connection to Arena, (None at Time of Contract)																						0	$0	$0	$0	$0	**$0.00**	
	Connection to Hotel																						0	$0	$0	$0	$0	**$0.00**	
	Planning for Future Connectivity to the Development	8	16	24				2		2					24	16							92	$9,940	$0	$9,940	$0	**$9,940.00**	
	Connections to Future North Garage																						0	$0	$0	$0	$0	**$0.00**	
																													$9,940.00
13	**Water Main Design**																												
	Horizontal Alignment																						0	$0	$0	$0	$0	**$0.00**	
	Vertical Alignment																						0	$0	$0	$0	$0	**$0.00**	
	Detail Drawings																						0	$0	$0	$0	$0	**$0.00**	
	Utility Conflict Verification and Resolution																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
14	**Wastewater Design**																												
	Horizontal Alignment																						0	$0	$0	$0	$0	**$0.00**	
	Vertical Alignment																						0	$0	$0	$0	$0	**$0.00**	
	Detail Drawings																						0	$0	$0	$0	$0	**$0.00**	
	Utility Conflict Verification and Resolution																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
15	**Right-of-Way**																												
	Right-of-Way Plans																						0	$0	$0	$0	$0	**$0.00**	
	Legal Descriptions																						0	$0	$0	$0	$0	**$0.00**	
	Stake Right-of-Way																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
16	**Landscape Design**																												
	Landscape Design, Coordination with Streetscape														0	0							0	$0	$0	$0	$0	**$0.00**	
																													$0.00
17	**Second Submittal**																												
	Design Development & Combined Footing Design																						0	$0	$0	$0	$0	**$0.00**	
	Geometric Sheets		4																				4	$460	$0	$460	$0	**$460.00**	
	Civil Grading Plan																						0	$0	$0	$0	$0	**$0.00**	
	Civil Site Plan																						0	$0	$0	$0	$0	**$0.00**	
	Civil Utility Plan																						0	$0	$0	$0	$0	**$0.00**	
	Architectural Sheets	24	120	240	240										24	12							660	$61,320	$0	$61,320	$0	**$61,320.00**	
	Deep Foundations, Coordination with DEC Only	16				120	40																176	$22,160	$0	$22,160	$0	**$22,160.00**	
	Structural Design Sheets, 700 Stalls, Precast Structure	24				40	40																104	$12,640	$0	$12,640	$0	**$12,640.00**	
	Mechanical Design Sheets							16	8														24	$2,840	$0	$2,840	$0	**$2,840.00**	
	Plumbing Design Sheets							16	8														24	$2,840	$0	$2,840	$0	**$2,840.00**	
	Electrical Design Sheets									16	8												24	$2,840	$0	$2,840	$0	**$2,840.00**	
	Trafic Control Sheets																						0	$0	$0	$0	$0	**$0.00**	
	Signage Sheets																						0	$0	$0	$0	$0	**$0.00**	
	ITS sheets																						0	$0	$0	$0	$0	**$0.00**	
	Specifications																						0	$0	$0	$0	$0	**$0.00**	
	Preliminary Construction Phasing	16																					16	$2,560	$0	$2,560	$0	**$2,560.00**	
	Cost Estimates	40	32					2		2													76	$10,620	$0	$10,620	$0	**$10,620.00**	
	Coordination With DEC thru construction with Shared Ftng	60	20																				80	$11,900	$0	$11,900	$0	**$11,900.00**	
																													$130,180.00
18	**QA/QC**																												
	Plan Review																						0	$0	$0	$0	$0	**$0.00**	

MAN-HOUR ESTIMATE - Appendix A-18, Parking Deck #2- Partial Design Fees To Co-Locate DEC and Deck #2 on Same Site

No.	Description of Work Items / Tasks	PIC/PM	Proj Arch	AT	AD	SE	SD	ME	MD	EE	ED	ID	ADMIN	CA	SHA-Arch	SHA-CADD	0	0	0	0	0	0	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
																													$0.00
19	**Permit Applications**																												
	404 Permit																						0	$0	$0	$0	$0	**$0.00**	
	Floodplain Permit																						0	$0	$0	$0	$0	**$0.00**	
	SWPPP																						0	$0	$0	$0	$0	**$0.00**	
	NPDES Permit																						0	$0	$0	$0	$0	**$0.00**	
	Railroad Permit																						0	$0	$0	$0	$0	**$0.00**	
	Railroad Agreement																						0	$0	$0	$0	$0	**$0.00**	
	Railroad Insurance																						0	$0	$0	$0	$0	**$0.00**	
	NDOR Use of Right of Way Permit																						0	$0	$0	$0	$0	**$0.00**	
	NDOR Agreement																						0	$0	$0	$0	$0	**$0.00**	
	Lancaster County Utility Permit																						0	$0	$0	$0	$0	**$0.00**	
	Lancaster County Inter-local Agreement																						0	$0	$0	$0	$0	**$0.00**	
	Nebraska Dept. of Environmental Quality																						0	$0	$0	$0	$0	**$0.00**	
	City/County Health Dept. Noise Permit																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
20	**PS&E Submittals**																												
	Draft PS&E Submittal																						0	$0	$0	$0	$0	**$0.00**	
	Final PS&E Submittal																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
21	**Bidding Phase**																												
	Attend Pre-Bid Meeting																						0	$0	$0	$0	$0	**$0.00**	
	Answer Design Questions																						0	$0	$0	$0	$0	**$0.00**	
	Prepare Addenda																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
22	**Construction Phase**																												
	Attend Pre-Construction Meeting																						0	$0	$0	$0	$0	**$0.00**	
	Attend Pre-Trade Installation Meetings																						0	$0	$0	$0	$0	**$0.00**	
	On Site Representation During Concrete Placement																						0	$0	$0	$0	$0	**$0.00**	
	Attend Monthly Project Meetings																						0	$0	$0	$0	$0	**$0.00**	
	Review Shop Drawings																						0	$0	$0	$0	$0	**$0.00**	
	Prepare Change Orders																						0	$0	$0	$0	$0	**$0.00**	
	Prepare As Built Sheets																						0	$0	$0	$0	$0	**$0.00**	
	Answer Design Questions																						0	$0	$0	$0	$0	**$0.00**	
	Evaluate substitute "or equal" bids																						0	$0	$0	$0	$0	**$0.00**	
	Construction Admin, Site Visits and Coordination																						0	$0	$0	$0	$0	**$0.00**	
	Review and Certify Pay Requests																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
	Total Manhours	588	528	508	480	240	280	100	32	68	16	0	40	0	136	60	0	0	0	0	0	0	3076						
	Total	$94,080	$60,720	$40,640	$40,800	$32,400	$23,800	$13,500	$2,720	$9,180	$1,360	$0	$2,400	$0	$18,360	$4,200	$0	$0	$0	$0	$0	$0	$344,160	$344,160	$0	$344,160	$0	**$344,160.00**	
	Total Labor, OH & Profit	$94,080	$60,720	$40,640	$40,800	$32,400	$23,800	$13,500	$2,720	$9,180	$1,360	$0	$2,400	$0	$18,360	$4,200	$0	$0	$0	$0	$0	$0						**$344,160.00**	

benesch
engineers · scientists · planners

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P 402-479-2200
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March 31st, 2011

Mr. John S. Olsson
Olsson & Associates
1111 Lincoln Mall
Lincoln, NE 68508

REFERENCE: Geotechnical Engineering
Proposed West Haymarket A-14 (Deck #2) Parking Garage Structure
Approximately 6th & "P" Streets
Lincoln, Nebraska

Dear John:

Alfred Benesch and Company (Benesch) is pleased to submit a proposal for the providing of geotechnical engineering services for the referenced project.

It is Benesch's understanding that the City of Lincoln is considering construction of a new parking garage between "P" and "Q" Streets; and 5th and 6th Streets as part of the West Haymarket project. The proposed structure will be approximately 186'x300' in plan dimension and accommodate 835 parking stalls (+/-). Given the anticipated heavy footing loads it is assumed that the structure will be seated on a deep foundation system (i.e., piling). As such the drilling program is scheduled to extend down into the Dakota bedrock formation. As on the arena and associated parking garage project borings are scheduled to be located approximately 100 feet-on-center.

The District Energy Corporation (DEC) is proposing to construct a new DEC facility immediately adjacent and abutting the east side of the A-14 (Deck #2) parking garage. As part of preparing the cost estimate for the Deck #2 parking garage it was assumed that exploratory borings that will be performed for both the parking garage and DEC facilities would be used jointly to minimize the number of borings performed for each structure. Routinely either 8 or 9 borings would be performed for a parking garage having a footprint the size of the Deck #2 structure. This proposal intends to perform five borings for the proposed parking structure and utilize subsurface exploratory data from three borings to be performed for the DEC facility when preparing geotechnical engineering recommendations for Deck #2.

Mr. Michael A. Wachal – Structural Engineer with Davis Design has requested that Benesch provide seismic recommendations for the parking garage structure. In addition, it was requested that Benesch provide engineering assistance to compliment Davis Design's lateral pile analysis on the project.

DRILLING, IN-SITU TESTING, AND SAMPLING METHODS

BENESCH proposes to make five 30-foot-deep Dutch friction-cone soundings, four 90-foot-deep exploratory borings, and one 100-foot-deep exploratory boring at this proposed project site. The

depths of Dutch-cone soundings was selected based on the depths that compressible soils were encountered on other sites drilled as part of the geotechnical engineering work performed by Benesch for structures proposed by the City of Lincoln as part of the West Haymarket project.

The Dutch friction-cone soundings will be performed in accordance with ASTM D 3441, Standard Test Method for Deep, Quasi-Static, Cone and Friction-Cone Penetration Tests of Soil. The mechanical penetrometer operates in 8-inch increments, using a set of inner rods to operate a telescoping tip and to transmit the components of penetration resistance (cone bearing and friction sleeve resistance) to the surface for measurement. The plot of the test data provides data on soil types, layering, uniformity, and strength of various soils encountered. These data will be used to determine the locations of critical soils that might require sampling.

The soil borings will be made in accordance with ASTM D 1452, Standard Practice for Soil Investigation and Sampling by Auger Borings. A machine-driven, hollow-stem auger having an inside diameter of 3-1/4 inches will be used to advance the holes for thin-walled tube sampling. Relatively undisturbed samples of cohesive soils will be obtained at selected locations (based upon Dutch cone test results) in accordance with ASTM D 1587, Standard Method for Thin-Walled Tube Sampling of Soils, using an open-tube sampler having an outside diameter of 3.0 inches.

Penetration tests will be performed in accordance with ASTM D 1586, Standard Method for Penetration Test and Split-Barrel Sampling of Soils. Representative samples of the soil will be obtained for identification purposes. The resistance of the soil to penetration of the sampler, measured in blows per foot (N), is an indication of the relative density of cohesionless soil and of the consistency of cohesive soil.

Any subsurface contamination, as defined by the laws and regulations of the State of Nebraska, that is detected by odor or visual examination will be reported to the Owner with a written recommendation to consult an environmental specialist to evaluate any compliance and/or property development issues. Subsurface information previously obtained in the vicinity of the Deck #2 parking garage site would indicate the possibility that contaminated soil may be encountered above the groundwater level. Benesch has included cost associated with the drumming up and disposal of contaminated auger cuttings and auger wash water.

The subsurface materials will be identified and described in accordance with ASTM D 2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).

LABORATORY TESTING PROGRAM

The laboratory tests and procedures considered necessary to evaluate the pertinent engineering properties of the foundation soils include, but may not be limited to, the following:

1. Visual inspection of the thin-walled tube samples of foundation soils by a member of BENESCH' professional engineering staff.
2. Classification of typical soil types in accordance with ASTM D 2487, Standard Test Method for Classification of Soils for Engineering Purposes.
3. Moisture content and dry density of selected undisturbed samples of cohesive soil. These data correlate with the strength and compressibility of the soils. High moisture content and low density usually indicate low strength and high compressibility.

4. Consolidation/swell tests on representative samples of cohesive soils from within the critical floor subgrade and foundation zones. These tests will be performed in accordance with ASTM D 4546, Standard Test Methods for One Dimensional Swell/Settlement Potential of Cohesive Soils. The data from the consolidation/swell tests can be used to develop an estimate of the amount of heaving or settlement of the floor slab and footings that might occur.

5. Unconfined compression tests and triaxial compression tests on representative samples of clayey foundation soils. The unconfined compression tests will be performed in accordance with ASTM D 2166, Standard Test Method for Unconfined Compressive Strength of Cohesive Soil. Although not anticipated as being required at this time, any triaxial tests that would be recommended to be performed would be performed in accordance with ASTM D 4767, Standard Test Method for Consolidated-Undrained Triaxial Compression Test on Cohesive Soils. Unconfined and triaxial test data are used to determine the bearing capacities of foundation soils.

FOUNDATION ENGINEERING EVALUATION AND RECOMMENDATIONS

The field and laboratory data that would be included in the geotechnical engineering report are as follows:

1. Penetration diagrams of Dutch friction-cone penetrometer.
2. Boring logs.
3. Density and moisture content of undisturbed soil samples.
4. Unconfined compressive strengths of selected samples of foundation soils.
5. Consolidation/swell test data on selected samples of subgrade and foundation soils.
6. Geology:
   a) Depth to groundwater.
   b) Summary of surface and subsurface conditions at the site.
7. Soil classification chart and tables listing the criteria used to describe various soil properties.
8. Soil classification test data.

Benesch' geotechnical engineering report will include at a minimum the following information:

1. Allowable soil bearing pressure for lightly loaded spread footing design.
2. Minimum depth to suitable bearing material.
3. Pile foundation recommendations.
4. Lateral pile design recommendations.
5. Anticipated settlement that would be anticipated as the result of the combined loadings from the proposed fill constructed to raise the building site and proposed lower level floor.
6. Seismic recommendations for the parking garage design.
7. Recommendations for the necessity for site preparation involving preloading and surcharging if warranted for the magnitude of settlement

computed under the proposed fill and structures loadings, and lower level floor loading.

8. Frost depth requirements for the foundation system.
9. Analysis of soil to ascertain presence of potentially expansive soils.
10. Recommended types of fill and backfill materials and compaction requirements.
11. Estimate of settlement or heave of floor slabs and footings.
12. Active, passive, and at-rest earth pressures for use in design of retaining and building walls.
13. Recommendations for drainage of foundation and retaining walls.
14. Recommendations on seismic site classification.

FEE ESTIMATE

Benesch's estimate of the amount of work involved in the investigation is provided in Attachments A. The estimated total fee presented in Attachment A is $20,844.75. The total fee will not exceed $21,000.00 without the City of Lincoln's express authorization.

TIME SCHEDULE

Approximately three weeks time will be required to complete the soils exploration and engineering report, after receiving authorization to proceed and gaining site access. Verbal recommendations could be provided approximately one week after completing the field exploration work, depending upon the conditions encountered.

EXECUTION OF CONTRACT

If this fee estimate is acceptable to the City of Lincoln and approval is given for the performance of the geotechnical engineering services discussed herein, please sign below and return one copy to BENESCH. Upon execution and receipt by both parties, this Document shall form an Agreement between the City of Lincoln (through the OA/Benesch West Haymarket project engineering services agreement) and BENESCH. These services will continue to be performed in accordance with the attached General Conditions.

BENESCH appreciates having the opportunity to present this proposal. Please do not hesitate to contact us at your convenience if any clarification or additional information is required.

Respectfully submitted,

ALFRED BENESCH & COMPANY

Gary E. Proskovec, P.E.
Geotechnical Engineering Services Director

GEP/gep
Enclosure
P
V-2015A_14Deck#2ParkGarGeotCostEstPropLtr.doc
Orig. & 1 pc.: Mr. John S. Olsson – Olsson Associates
1 pc.: Mr. Jim Linderholm – Alfred Benesch & Company

By: _____
Authorized Signature

Title: _____

Date: _____, 20_____

ALFRED BENESCH & COMPANY

By: _____
Authorized Representative

Title: Vice President

Date: March 31st, 20 11

Alfred Benesch & Company
825 "J" Street, P.O. Box 80358
Lincoln, Nebraska 68501
(402) 479-2200
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Attachment A
Geotechnical Engineering Scope of Services and Fee Estimate
City of Lincoln W. Haymarket A-14 Parking Garage Subsurface Exploration
6th and "P" Streets; Lincoln, Nebraska

Item No.	Description	Estimated Quantity
I.	**Mobilization, One-call Coordination, and Equipment Preparation:**	
	1. Drill Rig and Crew	
	a. CME 75 Drill Rig	2.0 hr.
	b. Field/Lab Technician III	3.0 hr.
	c. Field/Lab Technician II	2.0 hr.
	d. Field/Lab Technician I	2.0 hr.
	2. Support Vehicle.	
	a. Vehicle Usage	32 hr.
	b. Vehicle Mileage	30 mi.
II.	**Site Layout, Utility Locate, Water Readings, Cleanup**	
	1. Field/Lab Technician III	3.0 hr.
	2. Field/Lab Technician I	2.0 hr.
	3. Field/Lab Technician I	2.0 hr.
	4. Survey Crew	Est'd. Amt.
III.	**Drilling and Sampling**	
	1. Dutch Friction-Cone Soundings	150 ft.
	(Five 30-foot-deep soundings)	
	2. Auger Borings (6-inch-dia. Straight Auger)	- ft.
	(-foot-deep borings)	
	3. Auger Borings (Hollow -stem auger; 0-50 ft. depth)	250 ft.
	(Five 50-foot-deep borings)	
	4. Auger Borings (Hollow-stem auger; 50-75 ft .depth)	125 ft.
	(Five 25-foot-deep borings)	
	5. Auger Borings (Hollow-stem auger; 75-100 ft .depth)	85 ft.
	(Four 15-foot-deep borings)	
	(One 25-foot-deep boring)	
	6. Standard Penetration Tests	
	(0-50 ft. depth)	50
	(50-75 ft depth)	25
	(75-100 ft. depth)	17
	7. Obtaining Undisturbed Soil Samples	12
	8. Field Vane Shear Test	-
	9. Backsaver Soil Probe	-
	10. Hand Auger Borings	
	a. Field/Technician III	- hr.
	b. Field/Lab Technician I	- hr.
	c. Electric Core Machine Rental	- hr.
	d. Coring (bit wear)	- in.
	e. Use of 3" Shelby Tubes	-
	f. Hand Auger	- day
	11. Rock Coring Bit Wear	- ft.
	12. Coring Support Trailer	- day
	13. Core Hole Setup	-
	14. Core Drilling	- ft.
	15. Mud and Drilling Fluid	- ft.
	16. Core Prep and RQD	-

Attachment A
Geotechnical Engineering Scope of Services and Fee Estimate
City of Lincoln W. Haymarket A-14 Parking Garage Subsurface Exploration
6th and "P" Streets; Lincoln, Nebraska

Item No.	Description	Estimated Quantity
IV.	**Materials Laboratory Testing**	
	1. Soil Density and Moisture Content Determination	16
	2. Soil Moisture Content Determination	4
	3. Liquid & Plastic Limits, and Plasticity index (dry prep.)	2
	4. Unconfined Compressive Strength of Soil	
	a. Uncarved shelby tube sample	-
	b. Carved sample	4
	5. Consolidation Test (without time deformation	-
	or permeability data)	
	6. Consolidation/Swell Test (without time deformation or	2
	permeability data)	
	7. Sand Content (+#200 only)	4
	8. Sieve Analysis (washed - more than 3000 grams)	-
	9. Mechanical Analysis w/ + #10 Material (Hydrometer)	-
	10. Moisture-Density Relations of Soil (Method A)	-
	11. Falling-Head Permeability Test	-
	12. Triaxial Compression of Cohesive Soil,	- pt.
	Consolidated-Undrained w/ Pore-Pressure (Back-	
	Pressure Saturated); 3 Points Per Envel.	
	13. Soil Corrosivity Test for Concrete (redox, pH, chlorides, sulfates)	
		- set
	14. Soil Corrosivity Test for Steel (redox, pH, resistivity, sulfides)	
		- set
	15. Soil Resistivity (App. A of ANSI/AWWA C105/A21.5)	-
	16. Crumb Test	-
	17. Pinhole Test	-
	18. Unconfined Compressive Strength of Rock Cores	-
	19. Fly Ash Stabilization Analysis for One Sample of CH Soil	
	a. Field/Lab Technician I	- hr.
	b. Liquid & Plastic Limits, and Plasticity Index	-
	20. Lime Stabilization Analysis for One Sample of CH Soil (Eades-Grim)	
	a. Ph Determination	-
	b. Moisture-Density Relations of Soil (Method A)	-
	c. Moisture-Density Relations of Soil-Cement	-
	d. Liquid & Plastic Limits, and Plasticity Index	-
	e. California Bearing Ratio (Each Point)	- pt.
V.	**Project Coordination, Analysis and Report Preparation**	
	1. Senior Project Manager	8.0 hr.
	2. Project Manager	2.0 hr.
	3. Project Engineer II	38.0 hr.
	4. Designer II	- hr.
	5. Project Scientist II	10.0 hr.
	6. Project Assistant II	1.0 hr.

Attachment A
Geotechnical Engineering Scope of Services and Fee Estimate
City of Lincoln W. Haymarket A-14 Parking Garage Subsurface Exploration
6th and "P" Streets; Lincoln, Nebraska

Item No.	Description	Estimated Quantity
VI.	**Reimbursable Expenses and Equipment**	
	Photocopies, Postage, Telephone Rate Charges,	Est'd. Amt.
	Facsimiles, etc.	
	Motel and Meals:	
	1. Motel	Est.
	2. Meals	Est.
VII.	**Removing Contaminated Soils, Disposal and Preliminary Recommendations**	
	1. PID Meter Rental	2.5 day
	2. Drumming Contaminated Auger-Cuttings & Decontamination Wash Wate	
	a. Field/Lab Technician III	4.0 hr.
	b. Field/Lab Technician I	- hr.
	c. Field/Lab Technician I	4.0 hr.
	3. Drums (4 for soil and wash water)	4.0 ea.
	4. Hotsy Power Washer	- day
	5. Soil Cutting Disposal (Assumes Non-Haz	3.0 ea.
	and Transport to Milford Landfill)	
	6. Auger Wash Water Disposal (Assumed Non-Haz	1.0 ea.
	and Transport to Local WWTP)	
	7. Project Engineer	3.0 hr.
	8. Environmental Engineer	- hr.
	Estimated Total Fee:	**$ 20,884.75**

Total cost will not exceed $21,000.00 without prior approval.

APPENDIX A - 19
Scope of Services

HAYMARKET INFRASTRUCTURE PROJECT
INITIAL SITE PREPARATION AND USPS PARKING LOT
CONSTRUCTION PHASE SERVICES

JPA Project Numbers 870703 and 870303

General Description of Scope of Services

This scope of services generally includes construction phase services for the Initial Haymarket Site Preparation Project and the USPS Parking Lot Reconstruction Project. These two projects have been tied and will be constructed by a single contractor due to the proximity of the work between the projects and the need for significant construction coordination between the two projects. The services to be provided under this contract will include normal and customary construction administration: full time construction observation of the work; geotechnical observation and soils testing for the excavation, over-excavation, embankment construction, surcharge placement and settlement monitoring for the work associated with the Initial Site Preparation Project; surveying at stockpiled soils and the North 48th Street Solid Waste Facility to verify final quantities or final grading contours; and other testing work such as compaction testing for utility trench backfill, concrete testing for concrete construction work and asphalt coring and density tests.

The following are the task items that are included as part of the scope of services for the Initial Haymarket Site Preparation Project and USPS Parking Lot Reconstruction Project.

Task 1. Construction Administration

The LHIT Team shall furnish a Construction Administrator on a part time basis to manage and oversee the construction work on the Initial Haymarket Site Preparation Project and the USPS Parking Lot Reconstruction Project. In addition to the Construction Administrator, support staff and engineering staff will assist the Construction Administrator throughout the course of the work on a part time as needed basis to maintain documents and respond to contract related questions or changes in conditions that may be encountered. For the purpose of this contract it is assumed that the Construction Administrator will be utilized on the project for approximately half time over the projected construction period starting May 2, 2011 and continuing through project close out expected to be on or before December 31, 2011.

a. Pre-Construction Conference

On a date and at a time and place set by the JPA, the LHIT Construction Administrator will prepare an agenda and conduct a pre-construction conference. The pre-construction conference will include a discussion of the Contractor's tentative schedule, procedures for transmittal and review of the Contractor's submittals, processing payment applications, critical work sequencing, change orders, record documents, and other items pertaining to execution of the contract documents as well as the Contractor's responsibilities for safety and first aid. Procedures for dealing with unforeseen problems will be developed and discussed.

b. General Construction Administration

The Contract Administrator shall provide general construction administration duties that are detailed in the following items. It is anticipated that the Contract Administrator will spend approximately half of their time to provide these services throughout the course of the project. For the purposes of estimating hours it was assumed the duration of the project shall be 8 months or 34 weeks.

c. Review Contractor's Submittals

Review Contractor submittals, for equipment, materials, and construction. All requests for variations from the contract documents will be reviewed with the JPA before issuing an approval to the contractor. Such reviews shall not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions and programs incidental thereto.

d. Pay Requests

Review and process the Contractor's payment requests, and forward to the owner for payment. The review will be for the purpose of making a full independent mathematical check of the Contractor's payment request. Olsson Associates will verify stored materials and the quantities of work completed, which are the basis of the payment request.

e. Project Modifications

Coordinate changes through the issuance of field orders, work change directives, or change orders that are agreed upon. Review all modifications to ensure that the owner's interests have been protected in the proceedings, and all modification requests will be discussed with the owner before they are developed in final form.

f. Project Files and Project Documentation

Set up and maintain appropriate project files that relate to the work. Including but not limited to, project correspondence, work change directives, change orders, meeting minutes, request for information, material certifications, test reports, weekly construction summaries and project schedules. Prepare and keep detailed notes, computations and measurements; records of quantities of pay items constructed or basis of acceptance of installed materials and a daily record of the Contractor's operations

g. Davis-Bacon Wage Documentation

Certified payroll record files will be established for all contractors on site and updated weekly. Review the Contractor's site EEO documentation and conduct wage rate interviews with Contractor personnel for compliance. Notification will be given to the Owner and the Contractor when documentation is observed to be in non-compliance.

h. Document Interpretation and Clarification

Provide Interpretation and clarification of contract documents for the owner and general contractor.

i. Progress Meetings

Prepare an agenda and conduct weekly meetings to assist in resolution of conflicts and maintain current scheduling of the project. Progress meetings will include discussion of the Contractors progress as it relates to the schedule, site coordination and defects and deficiencies in the work.

j. Periodic Site Visits
Perform visits to the construction site to observe progress of the work, conduct on site meetings, and consult with field personnel and the contractor's superintendent on items relating to the project.

k. Substantial Completion
Upon receipt of written notification from the Contractor of substantial completion, schedule a walk through to identify items to be completed or corrected prior to accepting substantial completion.

l. Final Completion
In the company of the owner and Contractor, conduct a final completion walk through to identify items requiring completion or correction prior to final payment.

m. Project Closeout
Coordinate appropriate information relating to final closeout of the project including a final set of record drawings for distribution as well as securing all necessary documentation allowing for processing of final payment.

Task 2. Construction Observation

The LHIT Team shall furnish a full time Resident Project Representative (RPR), and other staff to assist in observing performance of the work of the contractor over the projected construction period starting in May of 2011and continuing through project close out which is expected to occur prior to December 31, 2011. This will include all work associated with the Initial Haymarket Site Preparation Project and the USPS Parking Lot Reconstruction Project.

This work will generally include observation of site clearing and demolitions, utility construction, storm sewer construction, shoring and structure construction, pavement construction, coordination with soils testing and placement operations, oversight of work associated with beneficial reuse soils at the North 48th Street Solid Waste Facility and overall coordination with the BNSF Railway and other key stakeholders through the course of the construction.

Through more extensive on-site observations of the work in progress and field checks of materials, the RPR and assistants shall endeavor to provide further protection for the JPA against defects and deficiencies in the work. Specific services to be performed are as follows:

a. General Site Observation
Provide full time construction observation for the projects. This may include observation during evening hours and on weekends to adequately observe the contractor's work. It is anticipated that the contractor and/or his subcontractors will be working an average of 9 hours per day for an average of 6 days per week during the work up through substantial completion.

b. Schedules
Review the progress schedule, schedule of Shop Drawing submittals and schedule of values prepared by contractor and consult with Construction Administrator concerning acceptability.

c. Meetings

Attend meetings with contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.

d. Liaison

Serve as Construction Administrators liaison with contractor, working principally through contractor's superintendent and assist in understanding the intent of the Contract Documents; and assist the Construction Administrator in serving as owner's liaison with contractor when contractor's operations affect owner's on-site operations.

e. Shop Drawings and Samples

Record date of receipt of Shop Drawings and samples, receive samples which are furnished at the site by contractor, and notify Construction Administrator of availability of samples for examination. Advise the Construction Administrator and Contractor of the commencement of any Work requiring a Shop Drawing or sample if the submittal has not been approved.

f. Review of Work, Rejection of Defective Work, Observations and Tests

Conduct on-site observations of the Work in progress to assist Construction Administrator in determining if the Work is in general proceeding in accordance with the Contract Documents.

Report to Construction Administrator whenever RPR believes that any Work is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or has been damaged, or does not meet the requirements of any governing agency, test or approval required to be made; and advise Construction Administrator of Work that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, or approval.

g. Interpretation of Contract Documents

Report to the Construction Administrator when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Construction Administrator.

h. Modifications

Consider and evaluate Contractor's suggestions for modifications to the Plans and Specifications and report with RPR's recommendations to Construction Administrator. Transmit to Contractor decisions as issued by design Engineer.

i. Records

Maintain at the job site orderly files for correspondence, reports of job conferences, Shop Drawings and samples, reproductions of original Contract documents including all Work Directive Changes, Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Contract, ENGINEER's clarifications and interpretations of the Contract Documents, progress reports, and other Project related documents.

Maintain a diary or log book, recording Contractor hours on the job site, weather conditions, data relative to questions of Work Directive Changes, Change Orders or changed conditions, list of job site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures.

j. Reports

Furnish Construction Administrator weekly summary reports which include but are not limited to progress of the Work and Contractor's compliance with the progress schedule.

Draft proposed Change Orders and Work Directive Changes, obtaining backup material from Contractor and make recommendations to Construction Administrator relating to the Change Orders, Work Directive Changes, and Field Orders.

k. Payment Requests

Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Construction Administrator, noting particularly the relationship of the payment requested to the schedule of values, Work completed and materials and equipment delivered at the site but not incorporated in the work.

l. NPDES

Review the Contractor's documentation of the erosion and sediment control plan. Notify the Owner and the Contractor when documentation is observed to be in non-compliance. The implementation and documentation required to meet the requirements of the NPDES permit are not included in this scope of work.

m. Substantial Completion

Schedule and attend substantial completion walk through with the Owner, Contractor and Project Engineer. Prepare and distribute substantial completion punch list.

n. Final Completion

Schedule and attend the final completion walk through with the Owner, Contractor and Project Engineer. Prepare and distribute final completion punch list. Observe that all items on final list have been completed or corrected and make recommendations to Construction Administrator concerning acceptance.

o. Record Drawings

Maintain record drawings and specifications based on site observation and the Contractor's record drawings. This information will be combined and one set of redlined record drawings will be provided to the Owner at the completion of the project. Electronic files of the record drawings are not included in this scope of work.

Task 3. Survey

The LHIT Team shall perform survey services to cross section the stockpiled soils prior to the start of work and at the completion of the work associated with removal of the stockpiled soils to quantify the final quantities for payment. This work will include time for the Project Engineer to perform the final earthwork calculations necessary to determine the volume of stockpiled soils used prior to final payment.

In addition the LHIT Team will perform survey services to determine the final graded contours at the North 48th Street Solid Waste Facility following placement and grading for the beneficial reuse soils. This work will include time for the Project Engineer to utilize the survey data to develop a final graded surface for comparison with the proposed grading plan that was included with the contact document.

Task 4. Geotechnical Observation and Soils Testing

The LHIT Team shall provide a full time on-site soils technician during the completion of the excavation, over-excavation, embankment construction, surcharge placement and settlement monitoring for the work associated with the Initial Haymarket Site Preparation Project. This includes verification of unsuitable soils that need to be removed (and verification that it is suitable for beneficial reuse), monitoring of re-usable excavated material and stock piled soils for fills, compaction testing for fill material and monitoring of settlement plates to determine when surcharge material can be removed. This work is proposed to be performed by staff of the Geotechnical Engineer who performed the soils investigation for the West Haymarket Project and a detailed outline of services is attached.

Task 5. Materials and Other Testing

The LHIT Team shall provide materials testing and other testing as required for construction of the new utilities and pavements on the Initial Haymarket Site Preparation Project and the USPS Parking Lot Reconstruction Project. This would include concrete testing for new pavement and structure construction, compaction testing for pavement construction, coring and density testing at new asphalt construction, and compaction testing for trench backfill and backfill at structures. This work will also include compaction testing for the beneficial reuse soils to be placed at the North 48th Street Solid Waste Facility.

Task 6. Plan Revisions and Field Sketches

The LHIT Team shall prepare plan revisions and/or field sketches as required to address changes in the work due to changed conditions that may be encountered during the construction. This would include the necessary distribution of plan revisions or field sketches to the appropriate construction representatives.

Appendix A-19
Total Project Fee
Initial Site Preparation and USPS Parking Lot
Construction Phase Services
JPA Project Numbers 870703 and 870303

Task No.	Task Description		Fee Estimate
1	Construction Administration		$176,984.00
2	Field Observation		$157,872.00
3	Survey		$11,736.00
4	Geotechnical and Soils Testing (Included in Expenses)		$0.00
5	Materials and Other Testing		$22,300.00
6	Plan Revisions and Field Sketches		$19,672.00
7	Not Used		$0.00
8	Not Used		$0.00
9	Not Used		$0.00
	Expenses (Includes Subconsultant)		$185,000.00
		Total Project Cost	$573,564.00

PAY RATES (BASED ON HOURLY RATE SCHEDULE PER CLASSIFICATION)

Overhead Rate : 0%

Profit : 0%

Personnel		Total Hr.	Salary $ Per Hr.	Labor Cost	Total Cost
Principal/Project Manager	P/PM	0	$180.00	$0	$0.00
Team Leader	TL	92	$162.00	$14,904	$14,904.00
Contract Administrator	CA	763	$140.00	$106,820	$106,820.00
Senior Engineer	SE	0	$155.00	$0	$0.00
Senior Project Engineer	SPE	108	$142.00	$15,336	$15,336.00
Project Engineer	PE	0	$115.00	$0	$0.00
Associate Engineer	AE	30	$98.00	$2,940	$2,940.00
Assistant Engineer	ASE	0	$85.00	$0	$0.00
Senior Field Representative	SFR	1720	$92.00	$158,240	$158,240.00
Field Representative	FR	0	$78.00	$0	$0.00
Senior Field Technician	SFT	16	$70.00	$1,120	$1,120.00
Associate Field Technician	AFT	72	$60.00	$4,320	$4,320.00
Field Technician	FT	368	$50.00	$18,400	$18,400.00
Surveyor	SM	56	$80.00	$4,480	$4,480.00
Survey Crew Member (CM)	SCM	56	$55.00	$3,080	$3,080.00
Technical Manager	TM	380	$118.00	$44,840	$44,840.00
Design Technician	DT	16	$84.00	$1,344	$1,344.00
Senior Technician	ST	84	$80.00	$6,720	$6,720.00
Technicain	Tech	0	$71.00	$0	$0.00
Administrative Coordinator	AC	150	$70.00	$10,500	$10,500.00
Administrative Assistant	AA	18	$60.00	$1,080	$1,080.00
Expenses					**$185,000.00**
		3929		**$394,124**	**$579,124.00**

TOTAL EXPENSES					
Expenses	**Amount**		**$ Ea.**		**Cost**
Design					
Travel, mile (car)		MILES	0.50		$0.00
Travel, mile (survey vehicle)		MILES	0.68		$0.00
Subconsultant (Benesch)	1	L.S.	173001		$173,000.50
Half Size Plots (each)		EA.			$0.00
Mylars, Half Size Plots (each)		EA.			$0.00
Allowance for USPS Testing Expenses	1	L.S.	3000		$3,000.00
Allowance for Site Utility/Pavement Testing Expenses	1	L.S.	5000		$5,000.00
Miscellaneous Expenses(Plots, Copies, Reports, etc.)	1	L.S.	3499.5		$3,499.50
			Sub Total		**$184,500.00**
Survey Expenses					**$500.00**
Public Involvement Expenses					
			Total		**$185,000.00**

MAN-HOUR ESTIMATE - INITIAL SITE PREPARATION AND USPS PARKING LOT CONSTRUCTION PHASE SERVICES

Task No.	Description of Work Items / Tasks	P/PM	TL	CA	SE	SPE	PE	AE	ASE	SFR	FR	SFT	AFT	FT	SM	SCM	TM	DT	ST	Tech	AC	AA	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
1	**Construction Administration**																												
	Pre-Construction Conference		4	4		8				4							8		4		4		36	$4,256	$0	$4,256	$0	**$4,256.00**	
	General Construction Administration		24	743																			767	$107,908	$0	$107,908	$0	**$107,908.00**	
	Review Contractor Submittals					12											40						52	$6,424	$0	$6,424	$0	**$6,424.00**	
	Pay Requests																				16		16	$1,120	$0	$1,120	$0	**$1,120.00**	
	Project Modifications					16											40						56	$6,992	$0	$6,992	$0	**$6,992.00**	
	Project Files																				40		40	$2,800	$0	$2,800	$0	**$2,800.00**	
	Davis Bacon Wage Documentation			16																	16		32	$3,360	$0	$3,360	$0	**$3,360.00**	
	Document Interpretation & Clarification		8			16											40				8		72	$8,848	$0	$8,848	$0	**$8,848.00**	
	Progress Meetings		20			20											80				40		160	$18,320	$0	$18,320	$0	**$18,320.00**	
	Periodic Site Visits		20			20											60						100	$13,160	$0	$13,160	$0	**$13,160.00**	
	Substantial Completion		4			4											4				2		14	$1,828	$0	$1,828	$0	**$1,828.00**	
	Final Completion		2			2											2				2		8	$984	$0	$984	$0	**$984.00**	
	Project Closeout		2			2											2				2		8	$984	$0	$984	$0	**$984.00**	
																													$176,984.00
2	**Construction Observation**																												
	General Site Observation									1716													1716	$157,872	$0	$157,872	$0	**$157,872.00**	
																													$157,872.00
3	**Survey**																												
	Cross Section Stockpile														40	40	16	8					104	$7,960	$0	$7,960	$0	**$7,960.00**	
	North 48th Street Survey														16	16	8	8					48	$3,776	$0	$3,776	$0	**$3,776.00**	
																							0	$0	$0	$0	$0	**$0.00**	
																													$11,736.00
4	**Geotechnical Observation & Soils Testing**																												
	Subonsultant to Provide - Refer to Expenses																						0	$0	$0	$0	$0	**$0.00**	
																													$0.00
5	**Materials and Other Testing**																												
	USPS Utility Backfill/Subgrade Testing													40									40	$2,000	$0	$2,000	$0	**$2,000.00**	
	USPS Concrete Testing													60									60	$3,000	$0	$3,000	$0	**$3,000.00**	
	USPS Ashpalt Testing											4		8									12	$680	$0	$680	$0	**$680.00**	
	USPS Testing PM and Admin							10														6	16	$1,340	$0	$1,340	$0	**$1,340.00**	
	Site Utility Backfill/Subgrade Testing													160									160	$8,000	$0	$8,000	$0	**$8,000.00**	
	North 48th Street Compaction Testing													60									60						
	SWPPP Review/Inspection											4	72										76	$4,600	$0	$4,600	$0	**$4,600.00**	
	Site Concrete/Asphalt Testing											8		40									48						
	Site Testing PM and Admin							20														12	32	$2,680	$0	$2,680	$0	**$2,680.00**	
																													$22,300.00
6	**Plan Revisions and Field Sketches**																												
	Prepare Plan Revisions/Field Sketches		8			8											80		80				176	$18,272	$0	$18,272	$0	**$18,272.00**	
	Distribute Plan Revisions/Field Sketches																				20		20	$1,400	$0	$1,400	$0	**$1,400.00**	
																													$19,672.00
7	**Not Used**																												
																							0	$0	$0	$0	$0	**$0.00**	
																							0	$0	$0	$0	$0	**$0.00**	
																							0	$0	$0	$0	$0	**$0.00**	
																							0	$0	$0	$0	$0	**$0.00**	
																							0	$0	$0	$0	$0	**$0.00**	
																													$0.00
8	**Not Used**																												
																							0	$0	$0	$0	$0	**$0.00**	
																							0	$0	$0	$0	$0	**$0.00**	
																													$0.00
9	**Not Used**																												
																							0	$0	$0	$0	$0	**$0.00**	
																													$0.00
	Total Manhours	0	92	763	0	108	0	30	0	1720	0	16	72	368	56	56	380	16	84	0	150	18	3929						
	Total	$0	$14,904	$106,820	$0	$15,336	$0	$2,940	$0	$158,240	$0	$1,120	$4,320	$18,400	$4,480	$3,080	$44,840	$1,344	$6,720	$0	$10,500	$1,080	$394,124	$388,564	$0	$388,564	$0	**$388,564.00**	
	Total Labor, OH & Profit	$0	$14,904	$106,820	$0	$15,336	$0	$2,940	$0	$158,240	$0	$1,120	$4,320	$18,400	$4,480	$3,080	$44,840	$1,344	$6,720	$0	$10,500	$1,080						**$394,124.00**	

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April 24, 2011

Mr. John S. Olsson
Lincoln Haymarket Infrastructure Team
Olsson Associates
1111 Lincoln Mall
Lincoln, NE. 68508

REFERENCE: Cost Estimate For Construction Observation & Testing

I. Arena Building Site:

A. Phase I Grading - Unsuitable Site Fill Removal

B. Phase I Grading - Monitoring Re-usable Fill Excavated

C. Phase I Grading - Controlled Earth Fill Compaction Testing

D. Installation of Settlement Plates and Surcharge Monitoring

II. Phase II Building Sites Grading Observation & Testing:

A. Phase II Grading – Unsuitable Site Fill Removal

B. Phase II Grading – Monitoring of Re-usable Fill Excavated

C. **Phase II Grading – Controlled Earth Fill Compaction Testing**

West Haymarket Arena & Associated Building Pads
Approximately "O" to "S" Streets & 6th to 5th Streets
West Haymarket Area; Lincoln, Nebraska

Dear Mr. Olsson:

Alfred Benesch and Company (Benesch) is pleased to submit to the Lincoln Haymarket Infrastructure Team (LHIT), a proposal for the providing of geotechnical engineering services that first consist of the providing of construction observation and testing services for the proposed Arena and Arena parking garage sites. Specifically speaking, these construction observation, monitoring and testing services will include but not be limited to (1) the providing of site excavation inspection services to delineate which of the existing fill soils scheduled for excavation from the Arena and Arena parking garage areas are either suitable or unsuitable for reuse for the construction of controlled earth fill on this portion of the project, (2) the performance of fill compaction testing as these two building sites are raised to their design finished floor subgrade elevation (i.e., which for the Arena is approximately 1157.0' which is 1.0 foot above the 500-year flood stage elevation), (3) the installation of settlement monitoring plates that will be utilized to monitor site settlement and allow Benesch to establish when consolidation of compressible subsurface materials has been effectively accomplished and to provide direction for the proposed site surcharge materials to be removed, and (4) the attendance at weekly construction project meetings starting approximately May 1st, 2011 and continuing to approximately December 1st, 2011. Secondly, in addition to the services proposed for the Arena and Arena garage, this cost estimate provides the cost for the performance of construction observation and testing services for the Phase II grading operations within the building sites located between the "O" Street Overpass and "Q" Street (i.e., the south side of the Arena) which includes but is not limited to (1) the providing of site excavation inspection services to delineate which of the existing fill soils scheduled for excavation are either suitable or unsuitable for reuse for the construction of the controlled earth fill within the Phase II building and pavement areas, and (2) the performance of fill compaction testing for these building and pavement areas. For the sake of preparing this cost estimate assumptions had to be made as to the duration of time that each of the services will need to be provided, all without input from comprehensive design plans or a Project Contractor. Assumptions made as to the duration of time required to perform the construction observation, monitoring and testing services are presented in Attachment A-1 Scope of Services and Fee Estimate. It has been assumed that these construction observation, monitoring and testing services will be performed during the 2011 calendar year (possibly prior to December 1st, 2011). It has been assumed that the Grading Contractor will

be required to furnish the settlement plates and leveling sand required to monitor settlement under the proposed surcharge load.

CONSTRUCTION OBSERVATION, MONITORING AND TESTING SERVICES

Assumptions made when preparing the cost associated with providing each of the 6 respective construction observation, monitoring, and testing services presented in Attachment A-1 SCOPE OF SERVICES AND FEE ESTIMATE are as follows:

(1) PHASE I SITE EXCAVATION (Remove Approx. 3' of Unsuitable Floor Subgrade Materials – 5 days excavation time): It was assumed that approximately 5.0 days construction observation time will be spent to remove unsuitable existing fill materials which based on the findings of borings performed to date extend between 3.0 and 3.5 feet below existing grade within the proposed building and paved areas. It was assumed that site excavation inspection services would be required for 10 hours per day. Site observation services will include determining which excavated fill soils are suitable for reuse during the construction of the lower controlled/compacted earth fill within the Arena and garage pad sites.

(2) PHASE I SOIL COMPACTION TESTING (Backfilling of an approximately 3- to 3.5-foot-deep excavation and construction of controlled earth fill up to an elevation of approximately 1157 feet within the Arena Building footprint area and the providing of a soil compaction report): It was assumed that approximately 2000 cubic yards of compacted fill would be placed each day grading operations are performed which would relate to 55 days of fill compaction testing being required. It was assumed that soil compaction would be performed using a nuclear moisture-density meter and that six (6) Standard Proctor curves would be required to check compaction. Fill compaction operations were assumed to require fill compaction testing for a period of 10 hours per day.

(3) SETTLEMENT PLATE INSTALLATION AT UPTO NINE (9) LOCATIONS: It was assumed that settlement plates will require installation to monitor settlement under the proposed surcharge fill intended to facilitate settlement prior to the buildings construction. Benesch would set the settlement plates when compacted fill had been installed up to the existing site elevation. The plates would be located and their elevation established by Benesch survey department. Nine settlement plates are proposed for installation. It was assumed that the Grading Contractor will furnish the settlement plates and sand required for their leveling when installed. After the full compacted fill and surcharge had been installed one of Benesch's drill-rigs would be used to bore down to each settlement plate. Benesch' survey crew would take elevations on the settlement plates to facilitate our Soils Engineers ability to establish when settlement was into secondary consolidation and recommend that the surcharge soils could be removed and subsequent building construction could commence.

(4) PHASE II SITE EXCAVATION (Removal of approximately 5' of existing unsuitable fill from beneath building and pavement footprint areas – 15 days excavation time assumed): It was assumed that approximately 15 days construction observation time will be spent during the removal of unsuitable existing fill materials which based on the findings of borings performed to date extend between 5.0 and 5.5 feet below existing grade within the proposed building and paved areas. It was assumed that site excavation inspection services would be required for 10 hours per day. Site observation services will include determining which excavated fill soils are suitable for reuse during the construction of the lower controlled/compacted earth fill within the building and pavement areas to the south of the Arena pad site.

(5) PHASE II SOIL COMPACTION TESTING (Backfilling an approximately 5.0- to 5.5-foot-deep excavation and filling both building and pavement areas located between the Arena and "O" Street Overpass to proposed finished floor subgrade elevation. It was assumed that approximately 2000 cubic yards of compacted fill would be placed each day grading operations are performed which would relate to 39 days of fill compaction testing being required. It was assumed that soil compaction would be performed using a nuclear moisture-density meter and that six (6) Standard Proctor curves would be required to check compaction. Fill compaction operations were assumed to require fill compaction testing for a period of 10 hours per day.

(6) WEEKLY CONSTRUCTION MEETING ATTENDANCE AND FOLLOW-UP CONSULTATION. As part of preparing this portion of the cost estimate, it was assumed that Benesch

would be required to be involved in 24 weekly construction progress meetings between May 1st and December 1st, 2011. A Contractor was not available to provide insight into the actual number of weeks that will be required for the performance of the six segments of work discussed above.

This cost estimate for the providing of construction observation, monitoring, and testing services does not include a fee for the performance of Special Inspection Services (SIS) or concrete testing once building construction for the Arena commences above the proposed floor subgrade elevation of approximately 1157.0 feet. A cost for the performance of these services could be provided once the building design has been completed.

CONSTRUCTION OBSERVATION AND TESTING SERVICES FEE ESTIMATE

Benesch's estimate of the amount of work involved in the construction observation, monitoring and testing services discussed immediately above is provided in Attachments A-1. The estimated total fee presented in Attachment A-1 is $173,000.50. The total fee for these services will not exceed $173,000.50 without the LHIT's express authorization. The cost for additional services required on the project or credit for services not required will be computed using the unit rates presented in Attachments A-1. The cost for services not discussed in this submittal will be charged using the unit rates presented in future cost estimates (if requested) that JPA may solicit of Benesch.

TIME SCHEDULE

It has been assumed that the construction observation, monitoring and testing services discussed herein would be performed during the 2011 calendar year.

EXECUTION OF CONTRACT

These services will be performed in accordance with our current in-place contract agreement. BENESCH appreciates having the opportunity to present this cost estimate and to continue the on-going relationship that we have with the LHIT on the West Haymarket Project. Please do not hesitate to contact us at your convenience if any clarification or additional information is required.

Respectfully submitted,
ALFRED BENESCH & COMPANY

Gary E. Proskovec

Gary E. Proskovec, P.E.
Geotechnical Engineering Services Director

GEP/gep
Enclosure

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Orig. (via e-mail):	Lincoln Haymarket Infrastructure Team
1pc. (via e-mail):	OA Consulting– Mr. John S. Olsson
1pc. (via e-mail):	OA Consulting – Mr. Tom Leikam
1pc. 9via e-mail):	Benesch – Mr. Jim Linderholm

benesch
engineers · scientists · planners

Attachment A-1 Services Scope And Fee Est.For Phase I And II Arena To "O" St. Grading; Arena Surcharge Surcharge Monitoring; and Weekly Construction Meeting Attendance

Item No.	Description		Unit Price	Amount
I.	**"Phase I" Site Excavation (Remove Approx. 3' Of Unsuit. Floor Subgrade Materials -- 5 days excav. time):**			
	(Assumed 5, 10-Hour Days)			
	A. Personnel:			
	1. Field/Lab Technician III	50 hr.	$ 67.00 /hr.	$ 3,350.00
	2. Project Engineer II	4 hr.	$ 97.00 /hr.	$ 388.00
	3. Sr. Project Manager	2 hr.	$ 161.00 /hr.	$ 322.00
	4. Vehicle:			
	a. Daily Rate (to nearest hour of day)	50 hr.	$ 5.25 /hr.	$ 262.50
	b. Vehicle Mileage	50 mi.	0.70 /mi.	$ 35.00
	Subtotal I:		**$ 4,357.50**	
II.	**"Phase I"Soil Compaction Testing: Backfilling 3' and Constr. of Bldg. Fill to Elev. 1157' & Compaction Rpt.**			
	(Assumes 60, 12-Hour Days For Grading Inspection)			
	A. Personnel:			
	1. Field/Lab Technician III	720 hr.	$ 67.00 /hr.	$ 48,240.00
	2. Project Engineer II	40 hr.	$ 97.00 /hr.	$ 3,880.00
	3. Sr. Project Manager	20 hr.	$ 161.00 /hr.	$ 3,220.00
	4. Vehicle:			
	a. Daily Rate (to nearest hour)	720 hr.	$ 5.25 /hr.	$ 3,780.00
	b. Vehicle Mileage	600 mi.	0.70 /mi.	$ 420.00
	5. Nuclear Moisture/Density Gauge (8 hr/day)	360 hr.	$ 10.00 /hr.	$ 3,600.00
	6. Moisture-Density Relations of Soil (Method A)	6 ea.	$ 145.00 ea.	$ 870.00
	7. Moisture-Density Relations of Soil (One Point Check)	12 ea.	$ 61.00 ea.	$ 732.00
	8. Atterberg Limits Test - Dry Method	3 ea.	$ 91.00 ea.	$ 273.00
	9. Particle-Size Analysis of Soil w/ Plus No. 10 Material	3 ea.	$ 94.50 ea.	$ 283.50
	(No Specific Gravity)			
	Subtotal II:		**$ 65,298.50**	
III.	**Settlement Plate Installation (assuming 4 weeks monitoring time and readings 3 times/week)**			
	A. Settlement Plate Installation (9) , Location Survey, Initial Elevation & Weekly Elevations:			
	1. Field/Lab Technician III	39 hr.	$ 67.00 /hr.	$ 2,613.00
	2. Field/Lab Technician II	39 hr.	$ 47.00 /hr.	$ 1,833.00
	3. Plate Locates and Elevation:			
	a. Party Chief	18 hr.	$ 69.00 /hr.	$ 1,242.00
	b. Instrument Operator	18 hr.	$ 49.00 /hr.	$ 882.00
	4. Project Engineer II	9 hr.	$ 97.00 /hr.	$ 873.00
	5. Sr. Project Manager	4.5 hr.	$ 161.00 /hr.	$ 724.50
	6. Settlement Plates and Leveling Sand	Est.	@ cost	$ -
	(Assumed furnished by the Grading Contractor - if			
	not estimated cost for 9 is approx. $250.00)			

Item No.	Description		Unit Price	Amount
	B. Field relocation of settlement plates w/ drill rig and survey crew & settlement monitoring: (cont'd.)			
	(Assumed settlement plate readings 3 times per week for 4 weeks)			
	1. Plate Locates and Elevation:			
	a. Party Chief	18 hr.	$ 69.00 /hr.	$ 1,242.00
	b. Instrument Operator	18 hr.	$ 49.00 /hr.	$ 882.00
	2. Drill-rig and drill crew time (to drill down to plates from atop surcharge): (cont'd.)			
	a. Field Lab/Technician III	18 hr.	$ 67.00 /hr.	$ 1,206.00
	b. Field Lab/Tech I	18 hr.	$ 47.00 /hr.	$ 846.00
	c. CME-75 Drill Rig	18 hr.	$ 82.50 /hr.	$ 1,485.00
	d. Drill-rig support vehicle			
	i. Daily Rate (to nearest hour)	18 hr.	$ 5.25 /hr.	$ 94.50
	ii. Vehicle Mileage	30 mi.	0.70 /mi.	$ 21.00
	3. Plate Locates and Elevation:			
	a. Party Chief	108 hr.	$ 69.00 /hr.	$ 7,452.00
	b. Survey support vehicle			
	i. Daily Rate (to nearest hour)	108 hr.	$ 5.25 /hr.	$ 567.00
	ii. Vehicle Mileage	180 mi.	0.70 /mi.	$ 126.00
	C. Settlement readings data analysis & reporting to document approval for removal of surcharge materials			
	(Includes 6 hours for consultation and meetings relative to settlement findings)			
	a. Designer II	54 hr.	$ 76.00 /hr.	$ 4,104.00
	b. Survey support vehicle			
	c. Project Engineer II	36 hr.	$ 97.00 /hr.	$ 3,492.00
	d. Sr. Project Manager	18 hr.	$ 161.00 /hr.	$ 2,898.00
	Subtotal III:		**$ 32,583.00**	
IV.	**"Phase II" Site Excavation (Remove Approx. 5' Exist. Unsuit. Floor Subgrade Materials - 15 days excav. time):**			
	(Assumed 15, 10-Hour Days)			
	A. Personnel:			
	1. Field/Lab Technician III	150 hr.	$ 67.00 /hr.	$ 10,050.00
	2. Project Engineer II	7 hr.	$ 97.00 /hr.	$ 679.00
	3. Sr. Project Manager	4 hr.	$ 161.00 /hr.	$ 644.00
	4. Vehicle:			
	a. Daily Rate (to nearest hour of day)	150 hr.	$ 5.25 /hr.	$ 787.50
	b. Vehicle Mileage	150 mi.	0.70 /mi.	$ 105.00
	Subtotal I:		**$ 12,265.50**	
V.	**"Phase II" Soil Compaction Testing: Backfilling 5' & Constr. of Bldg. Fill "O" to "R" Streets & Compaction Rpt.**			
	(Assumes 39, 10-Hour Days For Grading Inspection)			
	A. Personnel:			
	1. Field/Lab Technician III	390 hr.	$ 67.00 /hr.	$ 26,130.00
	2. Project Engineer II	20 hr.	$ 97.00 /hr.	$ 1,940.00

Item No.	Description		Unit Price	Amount
V.	**"Phase II" Soil Compaction Testing: Backfilling 5' & Constr. of Bldg. Fill "O" to "R" Streets & Compaction Rpt.**			
	3. Sr. Project Manager	10 hr.	$ 161.00 /hr.	$ 1,610.00
	4. Vehicle:			
	a. Daily Rate (to nearest hour)	390 hr.	$ 5.25 /hr.	$ 2,047.50
	b. Vehicle Mileage	390 mi.	0.70 /mi.	$ 273.00
	5. Nuclear Moisture/Density Gauge (8 hr/day)	270 hr.	$ 10.00 /hr.	$ 2,700.00
	6. Moisture-Density Relations of Soil (Method A)	6 ea.	$ 145.00 ea.	$ 870.00
	7. Moisture-Density Relations of Soil (One Point Check)	12 ea.	$ 61.00 ea.	$ 732.00
	8. Atterberg Limits Test - Dry Method	3 ea.	$ 91.00 ea.	$ 273.00
	9. Particle-Size Analysis of Soil w/ Plus No. 10 Material	3 ea.	$ 94.50 ea.	$ 283.50
	(No Specific Gravity)			
	Subtotal II:		**$ 36,859.00**	
VI.	**Weekly Construction Meeting Attendance and Follow-up Consultation:**			
	(Assumed 24 weeks of construction progress meetings - During calendar year 2011)			
	A. Personnel:			
	1. Field/Lab Technician III	0 hr.	$ 67.00 /hr.	$ -
	2. Project Engineer II	96 hr.	$ 97.00 /hr.	$ 9,312.00
	3. Project Manager I	0 hr.	$ 140.00 /hr.	$ -
	4. Sr. Project Manager	72 hr.	$ 161.00 /hr.	$ 11,592.00
	5. Vehicle:			
	a. Trip Rate (to nearest hour)	60 hr.	$ 5.25 /hr.	$ 315.00
	b. Vehicle Mileage	240 mi.	0.70 /mi.	$ 168.00
	Subtotal VII:		**$ 21,387.00**	
VII.	**Special Inspection and Concrete Testing Services (None assumed as part of this proposal; fee computed**			
	after final design plans have been completed and with discussion with the Construction Contractor)			
VIII.	**Special Project Consultation and Meetings**			
	1. Personnel			
	a. Senior Project Manager	hr.	$ 161.00 /hr.	$ -
	b. Project Manager I	hr.	$ 140.00 /hr.	$ -
	c. Project Engineer II	hr.	$ 97.00 /hr.	$ -
	d. Designer II	hr.	$ 76.00 /hr.	$ -
	e. Field/Lab Technician III	hr.	$ 67.00 /hr.	$ -
	h. Field/Lab Technician I	hr.	$ 47.00 /hr.	$ -
	h. Field/Lab Technician II	hr.	$ 57.00 /hr.	$ -
	h. Field/Lab Technician III	hr.	$ 67.00 /hr.	$ -
	Subtotal IX:		**$ -**	

Attachment A-1; Scope of Services and Fee Estimate (cont'd.)

Item No.	Description		Unit Price	Amount
IX.	**Reimbursables**			
	A. Copying Charges, Permits, HNU Unit Charges, etc.	Est.	@ cost	$ 250.00
	Subtotal X:		**$ 250.00**	
		Estimated Total:		**$ 173,000.50**

APPENDIX A- 20
Scope of Services

HAYMARKET INFRASTRUCTURE DESIGN PROJECT
1ST & CORNHUSKER AND SUN VALLEY & WEST "O" STREET, TRAFFIC ANALYSIS AND INTERIM CONCEPT DESIGN

JPA Project Number Not Assigned

General Description of Scope of Services

This scope of services includes the traffic analyses and concept design activities necessary to:

- Identify interim improvements that can be made at the intersections of 1st Street & Cornhusker Highway and West "O" Street & Sun Valley Boulevard that would achieve improved traffic operations during pre-arena event and post-arena event conditions.
- Develop conceptual drawings illustrating proposed interim improvements
- Develop conceptual cost estimates for proposed interim improvements, including property acquisition costs resulting from anticipated right-of-way needs

The following are the task items that are included as part of the scope of services to evaluate interim improvements at the intersections of 1st Street & Cornhusker Highway and West "O" Street & Sun Valley Boulevard.

TASK 1. Project Management

a. *Project Management*

The Design Team Project Manager will serve as point of contact, maintain project schedule and budget, and be responsible for coordinating work of the design team for this project. This work will include providing regular progress reports to support invoicing and updates on design schedule. Project Management efforts will follow appropriate guidance as given in the City of Lincoln's website "Guiding Principles and Procedures (GP&P)"

b. *Coordination with Others*

The Design Team will coordinate their design with agencies and/or Consultants that are involved with this project or adjacent projects. Coordination includes one-on-one meetings with the agencies or Consultants. This work item does not include coordination with utilities which is covered under Task 3 of this scope of services.

TASK 2. General Project Meetings

a. *Kick-Off Meeting*

No kickoff meeting is required with this project.

b. Progress/Review Meetings

The Design Team Project Manager will schedule and attend all progress meetings for this individual project. The Design Team will create and distribute a meeting agenda at least 48 hours prior to all progress meetings. This scope estimates two (2) progress meetings.

TASK 3. Utility Coordination

a. Utility Location/Verification

The Design Team will review the utility locations shown on the survey provided by the JPA and verify these locations during field inspections. Concept plans, once developed, will be printed and distributed to the Utility Companies for verification of ownership, type, size, location, and cased or uncased.

The Design Team will request that the Utility Companies return to the Design Team marked up plans with utility verification. Any impacts to existing utilities will be incorporated into the conceptual cost estimate.

TASK 4. Traffic

a. Traffic Analysis

As an amendment to JPA Project Number 870306, the draft traffic analysis and report (February 2011) performed for evaluating pre-event and post-event traffic conditions along roadways west of Salt Creek will be reevaluated to incorporate the most current parking stall counts proposed as part of the West Haymarket Development. This is necessary as the original parking assumptions (made in December 2010) have changed significantly. This evaluation will be performed to document 2013 (opening year of arena), 2019 (year of private development full build-out) and 2035 conditions with and without the proposed transportation improvements along Cornhusker Highway, Sun Valley Boulevard, West "O" Street, 1st Street, Charleston Street and Line Drive. Specific focus of this evaluation will be given to the following intersections:

- West "O" Street/Sun Valley Boulevard
  - Full-build improvements
  - Interim improvements
- Sun Valley Boulevard/Line Drive
- Sun Valley Boulevard/Charleston Street
- 1st Street/Cornhusker Highway
  - Full-build improvements
  - Interim improvements
- 10th Street/Sun Valley Boulevard
- 11th Street/Saunders Avenue
- 11th Street/Cornhusker Highway

Upon completion of the traffic analysis, the Design Team will prepare:

- Interim improvements: a technical memorandum summarizing the traffic measures-of-effectiveness (e.g., level-of-service, delay, queue lengths) resulting from the following scenarios of interim improvements:
  - 1st Street & Cornhusker Highway
    - Scenario 1 – increase length of westbound left-turn lane
    - Scenario 2 – provide exclusive eastbound right-turn lane
    - Scenario 3 – provide exclusive northbound right-turn lane
    - Scenario 4 – Scenario 1 + Scenario 2

        - Scenario 5 – Scenario 1 + Scenario 3
        - Scenario 6 – Scenario 2+ Scenario 3
        - Scenario 7 – Scenario 1 + Scenario 2 + Scenario 3
    - West "O" Street & Cornhusker Highway
        - Scenario 1 – increase length of eastbound left-turn lane
        - Scenario 2 – provide exclusive southbound right-turn lane
        - Scenario 3 – Scenario 1 + Scenario 2

  Prior to commencing the Conceptual Design task, the JPA will provide guidance to the Design Team on which one (1) scenario for each intersection will be advanced to Conceptual Design.

- Full-build improvements: a report, to be reviewed by the Program Manager and the JPA Project Management Team, that contains graphics as needed to reflect the recommendations, geometrics, and design alternatives studied.

TASK 5. Conceptual Design

a. Site Inspections (Estimated 2 Visits)

b. Prepare Design Concepts

Design Team will develop plan view design concepts for one (1) scenario at 1st Street & Cornhusker Highway and one (1) scenario at West "O" Street & Sun Valley Boulevard. Design concepts will include the level of detail as those developed as part of the previously completed TEUP study. This detail will generally illustrate roadway alignment and geometrics. Vertical profiles and roadway cross-sections will not be developed.

c. Cost Estimates

The Design Team shall prepare a conceptual cost estimate. This shall include Preliminary Engineering, ROW acquisition, Private Utility Relocations, Public Utility Relocations, Construction, and Construction Engineering on the appropriate forms.

TASK 6. Full-Build Right-of-Way Impacts

Using the concepts (plan view only) developed as part of the TEUP study, the Design Team will refine the permanent property impacts, including permanent acquisition, temporary easements and property damages associated with the full-build improvements at the intersections of 1st Street & Cornhusker Highway and West "O" Street & Sun Valley Boulevard. The Design Team will coordinate with JPA and City staff to determine the appropriate unit costs related to these impacts.

JPA Responsibilities

The City of Lincoln will supply the following information:

- ❑ Topographic Survey
- ❑ Available current and future traffic volumes and reports

Appendix A-20
Total Project Fee

1st & Cornhusker and Sun Valley & West O St., Traffic & Interim Concept Design
JPA Project Number

Task No.	Task Description		Fee Estimate
1	Project Management		$1,620.00
2	General Project Meetings		$0.00
3	Survey		$0.00
4	Utility Coordination		$0.00
5	Public Involvement		$0.00
6	Drainage Analysis		$0.00
7	Traffic		$0.00
8	First Submittal		$0.00
9	Geotechnical Evaluation		$0.00
10	Environmental / Historical Review		$0.00
11	Exist Water - Sanitary Relocates		$0.00
12	Structural / Bridge Design		$0.00
13	Water Main Design		$0.00
14	Wastewater Design		$0.00
15	Right-of-Way		$0.00
16	Landscape Design		$0.00
17	Second Submittal		$0.00
18	QA/QC		$0.00
19	Permit Applications		$0.00
20	PS&E Submittals		$0.00
21	Bidding Phase		$0.00
22	Construction Phase		$0.00
	Expenses (Includes Subconsultant)		$37,750.00
		Total Project Cost	$39,370.00

OA PAY RATES (BASED ON HOURLY RATE SCHEDULE PER CLASSIFICATION)

Overhead Rate : 0%

Profit : 0%

Personnel		Total Hr.	Salary $ Per Hr.	Labor Cost	Total Cost
Principal/Project Manager	P/PM	0	$180.00	$0	$0.00
Team Leader	TL	10	$162.00	$1,620	$1,620.00
Group Leader	GL	0	$148.00	$0	$0.00
Senior Engineer	SE	0	$155.00	$0	$0.00
Senior Project Engineer	SPE	0	$142.00	$0	$0.00
Project Engineer	PE	0	$115.00	$0	$0.00
Associate Engineer	AE	0	$98.00	$0	$0.00
Assistant Engineer	ASE	0	$85.00	$0	$0.00
Senior Scientist	SS	0	$120.00	$0	$0.00
Senior Project Scientist	SPS	0	$105.00	$0	$0.00
Project Scientist	PS	0	$90.00	$0	$0.00
Associate Scientist	ACS	0	$70.00	$0	$0.00
Assistant Scientist	AS	0	$60.00	$0	$0.00
Surveyor	SM	0	$80.00	$0	$0.00
Survey Crew Member (CM)	SCM	0	$55.00	$0	$0.00
Technical Manager	TM	0	$118.00	$0	$0.00
Design Technician	DT	0	$84.00	$0	$0.00
Senior Technician	ST	0	$80.00	$0	$0.00
Technicain	Tech	0	$71.00	$0	$0.00
Administrative Coordinator	AC	0	$70.00	$0	$0.00
Administrative Assistant	AA	0	$60.00	$0	$0.00
Expenses					**$37,750.00**
		10		**$1,620**	**$39,370.00**

TOTAL EXPENSES					
Expenses	**Amount**		**$ Ea.**		**Cost**
Design					
Travel, mile (car)		MILES	0.50		$0.00
Travel, mile (survey vehicle)		MILES	0.68		$0.00
Subconsultant - Schemmer	1	L.S.	37750		$37,750.00
Half Size Plots (each)		EA.	0.3		$0.00
Mylars, Half Size Plots (each)		EA.	4.5		$0.00
Aerial Mapping (DTM)		L.S.			$0.00
Miscellaneous Expenses(Plots, Copies, Reports, etc.)		L.S.	500		$0.00
Geotechnical Borings and Lab Testing		L.S.	200		$0.00
			Sub Total		**$37,750.00**
Survey Expenses					
Public Involvement Expenses					
			Total		**$37,750.00**

OA MAN-HOUR ESTIMATE - 1st and Cornhusker & Sun Valley and West O Interim Improvements Traffic and Concept Design

Task No.	Description of Work Items / Tasks	P/PM	TL	GL	SE	SPE	PE	AE	ASE	SS	SPS	PS	ACS	AS	SM	SCM	TM	DT	ST	Tech	AC	AA	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)	
1	**Project Management**																												
	Project Management		10																				10	$1,620	$0	$1,620	$0	**$1,620.00**	
	Coordination with Others																						0	$0	$0	$0	$0	**$0.00**	
	Design Memorandum																						0	$0	$0	$0	$0	**$0.00**	
	Condemnation Hearings																						0	$0	$0	$0	$0	**$0.00**	
																													$1,620.00
2	**General Project Meetings**																												
																													$0.00
3	**Survey**																												
																													$0.00
4	**Utility Coordination**																												
																													$0.00
5	**Public Involvement**																												
																													$0.00
6	**Drainage Analysis**																												
																													$0.00
7	**Traffic**																												
																													$0.00
8	**First Submittal**																												
																													$0.00
9	**Geotechnical Investigation**																												
																													$0.00
10	**Environmental/Historical Review**																												
																													$0.00
11	**Water Main/Wastewater Relocation**																												
																													$0.00
12	**Structural Design**																												
																													$0.00
13	**Water Main Design**																												
																													$0.00
14	**Wastewater Design**																												
																													$0.00
15	**Right-of-Way**																												
																													$0.00
16	**Landscape Design**																												
																													$0.00
17	**Second Submittal**																												
																													$0.00
18	**QA/QC**																												
																													$0.00
19	**Permit Applications**																												
																													$0.00
20	**PS&E Submittals**																												
																													$0.00
21	**Bidding Phase**																												
																													$0.00
	Total Manhours	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10						
	Total	$0	$1,620	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,620	$1,620	$0	$1,620	$0	**$1,620.00**	
	Total Labor, OH & Profit	$0	$1,620	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0						**$1,620.00**	

Appendix A-20
Total Project Fee - Schemmer

1st & Cornhusker Hwy and Sun Valley & West "O" St., Traffic and Interim Concept Design
JPA Project Number

Task No.	Task Description		Fee Estimate
1	Project Management		$3,820.00
2	General Project Meetings		$1,580.00
3	Survey		$0.00
4	Utility Coordination		$940.00
5	Public Involvement		$0.00
6	Drainage Analysis		$0.00
7	Traffic		$17,100.00
8	First Submittal		$9,410.00
9	Geotechnical Evaluation		$4,900.00
10	Environmental / Historical Review		$0.00
11	Exist Water - Sanitary Relocates		$0.00
12	Structural / Bridge Design		$0.00
13	Water Main Design		$0.00
14	Wastewater Design		$0.00
15	Right-of-Way		$0.00
16	Landscape Design		$0.00
17	Second Submittal		$0.00
18	QA/QC		$0.00
19	Permit Applications		$0.00
20	PS&E Submittals		$0.00
21	Bidding Phase		$0.00
22	Construction Phase		$0.00
	Expenses		$0.00
		Total Project Cost	$37,750.00

PAY RATES - 1st St. & Cornhusker Hwy and West "O" St. & Sun Valley Blvd. (Interim) Improvements - Schemmer

Overhead Rate :	**0%**
Profit :	**0%**

Personnel		Total Hr.	Salary $ Per Hr.	Labor Cost	Total Cost
Principal	Principal	7	$190.00	$1,330	$1,330.00
Group Leader	Grp Ldr	25	$170.00	$4,250	$4,250.00
Senior Engineer	Sr Eng	74	$150.00	$11,100	$11,100.00
Traffic Engineer	TR Eng	0	$150.00	$0	$0.00
Senior Project Engineer	Sr PE	92	$160.00	$14,720	$14,720.00
Project Engineer	PE	28	$105.00	$2,940	$2,940.00
Assistant Engineer	Asst. Eng.	0	$85.00	$0	$0.00
Senior Surveyor	RLS	0	$115.00	$0	$0.00
Surveyor	Surveyor	0	$90.00	$0	$0.00
Assistant Surveyor	Asst. Surveyor	0	$75.00	$0	$0.00
2-Man Survey Crew w/ GPS	CREW	0	$140.00	$0	$0.00
Design Technician	TECH	22	$90.00	$1,980	$1,980.00
Senior Technician	Sr. Tech	0	$90.00	$0	$0.00
Assistant Technician	Asst. Tech	20	$65.00	$1,300	$1,300.00
Public Involvement Specialist	PI	0	$75.00	$0	$0.00
Administrative Assistant	Admin. Ast.	2	$65.00	$130	$130.00
Expenses					**$0.00**
		270		**$37,750**	**$37,750.00**

TOTAL EXPENSES - 1st St. & Cornhusker Hwy and West "O" St. & Sun Valley Blvd. (Interim) Improvements - Schemmer					
Expenses	**Amount**		**$ Ea.**		**Cost**
Design					
Travel, mile (car)	0	MILES			$0.00
Travel, mile (survey vehicle)	0	MILES	0.50		$0.00
Environmental Documentation (lump sum)		L.S.			$0.00
Half Size Plots (each)		EA.			$0.00
Mylars, Half Size Plots (each)		EA.			$0.00
Aerial Mapping (DTM)		L.S.			$0.00
Miscellaneous Expenses(Plots, Copies, Reports, etc.)	0	L.S.			$0.00
Geotechnical Borings and Report		L.S.			$0.00
Public Meeting Expenses		L.S.			$0.00
			Sub Total		**$0.00**
Survey Expenses					
Public Involvement Expenses					
			Total		**$0.00**

MAN-HOUR ESTIMATE - 1st & Cornhusker and Sun Valley & West "O" St., Traffic Analysis and Interim Concept Design - Schemmer

Task No.	Description of Work Items / Tasks	Principal	Grp Ldr	Sr Eng	TR Eng	Sr PE	PE	Asst. Eng.	RLS	Surveyor	Asst. Surveyor	CREW	TECH	Sr. Tech	Asst. Tech	PI	Admin. Ast.	Total Manhours	Total Labor Fee	Overhead 0.00%	Total (A+B)	Profit 0.00%	Total Fee (A+B+C)
1	**Project Management**																						
	Project Management	4	8															12	$2,120	$0	$2,120	$0	**$2,120.00**
	Coordination with Others		4	4			4											12	$1,700	$0	$1,700	$0	**$1,700.00**
2	**General Project Meetings**																						
	Kick-Off Meeting																	0	$0	$0	$0	$0	**$0.00**
	Progress/Review Meetings		4	6														10	$1,580	$0	$1,580	$0	**$1,580.00**
3	**Utility Coordination**																						
	Utility Location / Verification			4			2										2	8	$940	$0	$940	$0	**$940.00**
4	**Traffic**																						
	Traffic Analysis-full build design	2	2			80									16			100	$14,560	$0	$14,560	$0	**$14,560.00**
	Traffic Analysis-interim design	1	1			12									4			18	$2,540	$0	$2,540	$0	**$2,540.00**
5	**Conceptual Design**																						
	Site Inspections			4			6											10	$1,230	$0	$1,230	$0	**$1,230.00**
	Prepare Design Concepts		2	20									10					32	$4,240	$0	$4,240	$0	**$4,240.00**
	Cost Estimates		2	16			8						4					30	$3,940	$0	$3,940	$0	**$3,940.00**
6	**Full-Build Right-of-Way Impacts**																						
	Full-Build Right-of-Way Impacts		2	20			8						8					38	$4,900	$0	$4,900	$0	**$4,900.00**
	Total Manhours	7	25	74	0	92	28	0	0	0	0	0	22	0	20	0	2	270					
	Total	$1,330	$4,250	$11,100	$0	$14,720	$2,940	$0	$0	$0	$0	$0	$1,980	$0	$1,300	$0	$130	$37,750	$37,750	$0	$37,750	$0	**$37,750.00**
	Total Labor, OH & Profit	$1,330	$4,250	$11,100	$0	$14,720	$2,940	$0	$0	$0	$0	$0	$1,980	$0	$1,300	$0	$130						**$37,750.00**

APPENDIX B-4 PROJECT SCHEDULE FOR AMENDMENT NO. 4

No.	Individual Project Component	Design Start	Target Ready to Bid Date Plans and Specifications	Target Construction Start Date	Target Construction Substantial Completion or Coordination/Analysis Complete
3	10th and Salt Creek Additional Services	11/1/2010	3/4/2011	4/11/2011	8/26/2011
5	"M" and "N" Streets, 7th to 10th Additional	11/1/2010	6/1/2011	7/15/2011	9/1/2012
13	ITS and Dynamic Message Signs	2/1/2011	5/1/2012	7/1/2012	9/27/2013
18	Parking Garage No. 2 Partial Design to Co-locate With DEC	Note 1	NA	NA	NA
19	Initial Site and USPS Parking Lot Construction Phase Services	5/1/2011	NA	5/9/2011	12/31/2011
20	1st & Cornhusker and Sun Valley and West "O" Street, Traffic Analysis and Interim Design	5/9/2011	8/31/2011	Not Determined	Not Determined

Note 1: Work on preliminary design for Garage No. 2 required start date of 2-14-11 to facilitate design of proposed DEC Plant due to joint structure/foundation systems.

WH 11-36 Introduce: 5-5-11

RESOLUTION NO. WH- _____

BE IT RESOLVED by the Board of Representatives of the West Haymarket Joint Public Agency:

That the attached Public Works & Utilities Engineering Services Scope of Services and estimated fees for General Administration and Project Management, Design Phase Services, and Construction Phase Services, is hereby accepted and approved.

Adopted this _____ day of May, 2011.

Introduced by:

_____

Approved as to Form & Legality:

_____
Legal Counsel for
West Haymarket Joint Public Agency

West Haymarket Joint Public Agency
Board of Representatives

_____
Jayne Snyder, Chair

_____
Tim Clare

_____
Chris Beutler

West Haymarket Infrastructure Projects

Public Works & Utilities – Engineering Services
Scope of Services

a. *General Administration and Project Management*

Engineering Services will continue to provide general support for the JPA. Services provided include but are not limited to creating agendas, advertising, and preparing minutes for formal board meetings as well as preparing materials for and making presentations to the board, processing JPA board member requests for information, and other administrative needs as they may arise.

Engineering Services staff will attend weekly LHIT coordination meeting and weekly Program Manager meeting. Engineering Services staff will also attend issue specific meetings when appropriate as they may arise.

Engineering Services will review all LHIT invoices and provide an approval recommendation to the Program Manager.

Fee Estimate: $458,426

b. *Design Phase Services*

Engineering Services will provide a city project manager to coordinate with LHIT to facilitate all necessary city departmental and divisional reviews of infrastructure projects.

Engineering Services will coordinate with LHIT and Program Manager to assemble bid packages for infrastructure projects and ensure that City bidding procedures are followed.

Fee Estimate: $446,991

c. *Construction Phase Services*

Engineering Services will provide construction phase services for the following projects:

10th and Salt Creek Roadway Improvements	$343,200
Fee Estimate:	**$343,200**

Total **$1,248,617**

WH 11-37 Introduce: 5-5-11

RESOLUTION NO. WH- _____

BE IT RESOLVED by the Board of Representatives of the West Haymarket Joint Public Agency:

That the attached Change Order No. 1 to the TCW Construction Inc. agreement regarding the 10th and Salt Creek Roadway Haymarket Infrastructure Improvement, Project No. 870304, for a cost of $14,469.00, is hereby accepted and approved and the Chairperson of the West Haymarket Joint Public Agency Board of Representatives is hereby authorized to execute said Change Order No. 1 on behalf of the JPA.

Adopted this _____ day of May, 2011.

Introduced by:

_____

Approved as to Form & Legality:

_____
Legal Counsel for
West Haymarket Joint Public Agency

West Haymarket Joint Public Agency
Board of Representatives

_____
Jayne Snyder, Chair

_____
Tim Clare

_____
Chris Beutler

LINCOLN
Haymarket Infrastructure Team®

CHANGE ORDER NO. 1

PROJECT DESCRIPTION: HAYMARKET INFRASTRUCTURE IMPROVEMENT
10TH & SALT CREEK ROADWAY
PROJECT 870304
BID NO. 11-053

CONTRACTOR: TCW CONSTRUCTION INC.
ADDRESS: 141 M Street, Lincoln, NE 68508

BID DATE:
ORIGINAL COMPLETION DATE:

REASON FOR CHANGE ORDER: See attached Contract Modification No.

The JPA, and TCW Construction agree to the following revisions to the above-mentioned contract.

I. QUANTITY REVISIONS

Field Modification No.	$0.00
SubTotal Increased Quantity Revision Cost:	$0.00

II. ADDITIONAL BID ITEMS

Field Modification No.	$14,469.00
SubTotal Additional Bid Items Cost:	$14,469.00
Total of Both Quantity Revisions and Additional Bid Items Cost:	$14,469.00

III. REVISED CONTRACT COST

The estimated contract construction cost is revised as follows:

Original Bid Estimated Construction Cost	=	$2,787,464,.22
Change Order No. 1	=	$14,469.00
Revised Estimated Construction Cost	=	$2,801,933.22

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IV. COMPLETION DATE

The completion date shall remain the same.

All other provisions of this contract shall remain the same. The changes included in this change order are to be accomplished in accordance with the terms, stipulations, and conditions of the original contract as though included therein.

ACCEPTED BY THE CONTRACTOR ON _____, 20_____.

By: _____
President ()

ACCEPTED
~~APPROVED~~ BY THE JPA ON 15 APR, 20 11.

By: _____
JPA Representative