

CITY OF LINCOLN
QC/QA
MATERIALS SAMPLING GUIDE
SECTION 1 - GENERAL

GENERAL

1. This Materials Sampling Guide details the minimum requirements for materials testing for the City of Lincoln's Quality Control/Quality Assurance (QC/QA) program utilizing consultant laboratories.
2. All construction within the City ROW must conform to the latest versions of the City of Lincoln Standard Specifications for Municipal Construction and the City of Lincoln Standard Plans unless superseded by project documents.
3. All materials used must be on the latest edition of the NDOT approved products list or produced by a company on the latest NDOT qualified material vendors list, unless approved by the Assistant Director of Transportation.
4. Material sampling and testing on NDOT regulated projects, shall conform to the current edition of the NDOT Materials Sampling Guide listed in the contract documents.
5. All sampling and testing shall be done by personnel using proper safety procedures, equipment, and the relevant ASTM, AASHTO, NDOT, and City of Lincoln Standards.
6. Sampling and testing personnel shall be trained and certified to comply with the required standards for the various materials. Certifications of said personnel shall be submitted to the Construction Manager prior to the start of the project. (See Section G for a listing of minimum requirements.)
7. All test results shall be submitted to the City Project Personnel on a weekly basis using the latest version of the corresponding reports from the City of Lincoln.
8. Contract documents will determine the duties required by all parties. At no time shall the Quality Control (QC) Lab be assigned as the Quality Assurance (QA) Lab for the same Project.
9. Quality Assurance testing will be performed in conjunction with Quality Control testing to verify testing procedures and results for materials, on the jobsite and in the laboratory. Samples obtained for laboratory testing shall be of sufficient size to permit proper splitting of the sample for correlation testing. Concrete tests shall be performed concurrently from the same load. Soils tests shall be performed within a 3' radius of each other to ensure testing of like material. Frequency of QA testing will be the greater of one per every 5 working days or one per every 10 Quality Control tests being performed, with the exception of

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Asphaltic Concrete testing which will be one per project or one per every five Quality Control tests, whichever is greater. Asphaltic Concrete QA testing shall be performed on a field sample of sufficient size to permit splitting of the sample. The Construction Manager may adjust the frequency of Quality Assurance testing depending on the progress of the project.

10. The Construction Inspector will coordinate the timing of the Quality Assurance testing to insure correlation sampling with the Quality Control testing. All samples must be obtained in a timely manner to preclude any undue environmental influence.
11. All procedures by the Quality Control Lab and the Quality Assurance Lab will be subject to random review by the Construction Inspector, any tests found not being performed in compliance with the standards will be rejected.

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SECTION 2 – SOILS

SOILS

1. Obtain compaction and moisture tests of all earthwork (e.g. fill, embankment, pavement sub-grade, and utility backfill) at elevations of least every 12-inches of fill placed at the rate of one test for each 200 linear feet of two-lane pavement or 300 linear feet of utility trench, not to exceed 300 cubic yards of material placed, and with a minimum of one test per day to represent the work. Additional testing within smaller areas of construction may be required at the direction of the Construction Manager.
2. Utility trench backfill tests at finished grade should be obtained by having the Contractor dig a sample hole 1' to 2' deep over the trench to remove any crusted material, unless compaction has just been completed. For depths between 2' and 4' below finished grade, tests are obtained by having the Contractor prepare a spot from the area currently being compacted. Sampling at depths greater than 4' below finished grade should only be done in trenches with the proper width, stepping, and/or shoring based on accepted practices for excavation and trench safety in the various soil types. Depth and location of testing shall vary randomly but should include intersection crossings and utility structures (e.g. manholes).
3. Inform the Construction Manager and Contractor of test results as soon as possible to allow for corrective measures and/or follow up testing if test results are out of the specification ranges for density or moisture.
4. Record and report compaction/moisture test information with correction factors or offsets indicated, and also include test location, street name, centerline station and offset, depth above or below finished grade, and indicate if retesting was performed for any failed tests.
5. All information developed for soils used on the project shall be reported to the Construction Manager. Including but not limited to Proctors (i.e., Moisture/Density Relationships), Atterberg limits, particle analysis (i.e. Hydrometer Method) and gradations.

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SECTION 2 – SOILS
LABORATORY TESTING

Minimum Material Certificate, Sample and Inspection Requirements					
MATERIAL	TYPE OF TEST	Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
LABORATORY SOIL TESTING			QA LABORATORY	INDEPENDENT LABORATORY	
1) Moisture / Density Relationship	Quality	A minimum of one moisture/density relationship must be performed for each soil type used on the project. Contractor must obtain an additional sample consisting of 60 pounds for possible QA testing.	Obtain sample from the contractor that represents the QC sample tested. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	AASHTO Standard Method T-99
2) Atterberg Limits	Quality	A minimum of one Atterberg Limits test must be performed in conjunction with the Moisture/Density Relationship.	Obtain sample from the contractor that represents the QC sample tested. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	AASHTO T 90-16 (Plastic Limit), AASHTO T 89(Liquid Limit)
3) Particle Analysis (Hydrometer Method)	Quality	A minimum of one Atterberg Limits test must be performed in conjunction with the Moisture/Density Relationship.	Obtain material samples from the contractor that represents the QC sample. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	ASTM 152H (Hydrometer Method)

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MATERIAL	TYPE OF TEST	Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
LABORATORY SOIL TESTING			QA LABORATORY	INDEPENDENT LABORATORY	
4) Gradation	Quality	A minimum of one gradation must be performed for each soil type used on the project. Contractor must obtain an additional sample consisting of 60 pounds for possible QA testing.	Obtain material samples from the contractor that represents the QC sample. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	AASHTO T27

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TESTING DURING CONSTRUCTION

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements			
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN	LOCATION OF ADDITIONAL INFORMATION	
Soil Testing During Construction			QA LABORATORY	INDEPENDENT LABORATORY	
1) Compaction Testing	Quality	At elevations of least every 12-inches of fill placed and at the rate of one test for each 200 linear feet of two-lane pavement or 300 linear feet of utility trench, not to exceed 300 cubic yards of material placed, and with a minimum of one test per day to represent the work. Additional testing within smaller areas of construction may be required at the direction of the Construction Manager.	Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 2

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SECTION 3 – PORTLAND CEMENT CONCRETE

PORTLAND CEMENT CONCRETE

1. Concrete materials must meet all requirements of City of Lincoln Standard Specifications.
2. Make a minimum of one set of three, 4" by 8" test cylinders for each concrete mix to represent each day's construction. Additional sets may be required at the direction of the Engineer. Cylinders will be stored as near the structure as possible and protected in a like manner. (e.g. if structure will be insulated to maintain heat then the cylinders will be treated likewise). Cylinders will not be placed in cooling boxes, as this is not representative of the environmental conditions of the structure. Each set of cylinders will be tested for compressive strength at 7 days and the average of two 28-day cylinders. Additional cylinders may be required depending on the strength requirements of the concrete mix specifications or for early access by the Contractor.
3. Prior to the start of each concrete placement of 100 cubic yards or more, an inspection of the concrete plant will be performed by the QC, and a cement certification shall be obtained. Aggregate samples for moisture and gradation testing will be required per every 1,000 cubic yards of concrete or a minimum of one per week per plant used while the Contractor is working. QC/QA verification requirements shall apply to the sampling and testing of the aggregate samples.
4. Each concrete placement of 100 cubic yards or more shall require air, slump (if specified) and concrete temperature tests in addition to one set of three, 4" by 8" cylinders for the first 100 cubic yards and subsequent tests to represent every 500 cubic yards thereafter, or a test for each one-third day's operation, whichever is greater. Tests should be run after any adjustments to the mix at the project site, and cylinders should be made after the tests, to be representative of concrete incorporated into the structure.
5. If concrete is pumped, tests must be run, and cylinders fabricated from concrete sampled after the pump with the hose at approximately the same angle as required for the structure, and not from the hose lying horizontal along the ground.
6. The QC representative should notify the Contractor and Construction Manager as soon as possible after testing so the Contractor can contact and direct the concrete plant personnel to allow for adjustments to the mix.

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7. If field tests indicate a need for a plant adjustment, additional tests should be run, and additional cylinders fabricated after adjustment.
8. If the air content of the concrete at the job site is less than the minimum specified, only one addition of air-entraining admixtures to a load is allowed. If the air content is then outside the limits specified, the load of concrete shall be rejected.
9. Admixtures which are not incorporated into the mix at the plant shall not be added to individual loads of concrete at the job site to enhance work-ability or pump-ability without permission from the Construction Manager.
10. QA/QC personnel will deliver their set of test cylinders to the testing lab for compression testing on the next business day following fabrication.
11. Test cylinders delivered to the testing lab shall be accompanied by a cylinder identification tag containing the following information: date and time of fabrication, project number and location, test location within project, structure, method of cure of both structure and test cylinders, method of placement, weather conditions at the time of testing, type of concrete mix, concrete plant, truck number, air, slump, and temperature tests if ran, any additional water in gals., added to the sample load represented by the tests, and quantity of any further addition of admixtures.
12. Truck delivery tickets indicating mix, plant, batch size, aggregate moisture, material weights, and admixtures must accompany every load delivered to the project site on City of Lincoln concrete pours and a copy of this ticket representing the load tested must accompany the test cylinders delivered to the testing lab.

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TESTING PRIOR PLACEMENT

Minimum Material Certificate, Sample and Inspection Requirements					
MATERIAL	TYPE OF TEST	Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
TESTING PRIOR TO PLACEMENT			QA LABORATORY	INDEPENDENT LABORATORY	
1) Plant Inspection	Quality	Contractor must provide daily documentation indicating that the material meets requirements of 2017 City of Lincoln Standard Specifications	Contractor to provide documentation to the City Project Manager.	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 3.
2) Cement	Quality	Contractor must provide daily documentation indicating that the material meets requirements of 2017 City of Lincoln Standard Specifications.	Contractor to provide documentation to the City Project Manager.	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 3.
3) Aggregates	Quality	Contractor must provide documentation indicating that the material meets requirements of 2017 City of Lincoln Standard Specifications. If document is not available, contractor will sample and test per 2017 City of Lincoln Standard Specifications.	Contractor to provide documentation to the City Project Manager.	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 3, Section 3.01C.
4) Aggregate Moisture and Gradation	Quality	Aggregate samples for moisture and gradation testing will be required per every 1,000 cubic yards of concrete or a minimum of one per week per plant used while the Contractor is working. Contractor must retain an additional sample of each lot for possible QA testing.	Obtain sample from the contractor that represents the QC sample. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 3.

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Minimum Material Certificate, Sample and Inspection Requirements					
MATERIAL	TYPE OF TEST	Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
TESTING PRIOR TO PLACEMENT			QA LABORATORY	INDEPENDENT LABORATORY	
5) Water / Mortar	Quality	Contractor must provide documentation indicating that the material meets requirements of 2017 City of Lincoln Standard Specifications. If document is not available, contractor will sample and test per 2017 City of Lincoln Standard Specifications	Contractor to provide documentation to the City Project Manager.	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 3, Section 3.01D.

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TESTING DURING PLACEMENT

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements			
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
TESTING DURING PLACEMENT			QA LABORATORY	INDEPENDENT LABORATORY	
1) Slump, air, temperature and cylinders	Quality	Contractor shall test concrete of 100 cubic yards or more for air, slump (if specified) and concrete temperature tests in addition to one set of three, 4" by 8" cylinders for the first 100 cubic yards and subsequent tests to represent every 500 cubic yards thereafter, or a test for each one-third day's operation, whichever is greater.	Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution	QC/QA Materials Sampling Guide and 2017 City of Lincoln Standard Specifications, Chapter 3.
2) Portland Concrete Pavement	Surface Smoothness	Contractor performs all QC pavement smoothness testing specified in the 2017 City of Lincoln Standard Specifications. Contractor personnel will submit pavement smoothness results to the City Project	Approximately 10 percent of contractor's results may be randomly verified.	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 4 of Subsection 405.C

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SECTION 4 – PORTLAND CEMENT CONCRETE PAVEMENT CORING

PORTLAND CEMENT CONCRETE PAVEMENT CORING

1. Before acceptance of new pavement construction, drilled cores shall be obtained by the QC to verify compliance with pavement design thickness and when necessary concrete compressive strength specifications.
2. The QC will provide the method of randomly selected core location determination to the City Project Manager for method approval prior to obtaining the cores. Cores for thickness measurements shall be taken at randomly selected stationing and offset, with a minimum 2" diameter core bit, at the QC rate of one core for each 300 linear feet of two-lane pavement. Additional cores shall be taken to represent turn lanes, intersections, and other areas as directed by the Engineer. If any ~~depth~~-core indicates insufficient pavement thickness, additional cores shall be taken to determine the limits of the area of thin pavement. Additional investigation using properly calibrated ground penetrating radar may be permitted as approved by the Engineer.
3. If test cylinders indicate questionable compressive strength, cores shall be taken by the QC using a 4" diameter core bit to represent the concrete in question and shall be delivered to the City Project Manager for compressive strength testing.
4. All core holes shall be filled immediately after cores are removed with a commercially produced concrete mix product approved by the Engineer.

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SECTION 4 – PORTLAND CEMENT CONCRETE PAVEMENT CORING

Minimum Material Certificate, Sample and Inspection Requirements					
MATERIAL	TYPE OF TEST	Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
PAVEMENT CORING			QA LABORATORY	INDEPENDENT LABORATORY	
1) Thickness Cores	Quality	Cores for thickness measurements depth shall be taken at randomly selected stationing and offset, with a minimum 2" diameter core bit, at the rate of one core for each 300 linear feet of two-lane pavement. Additional cores shall be taken to represent turn lanes, intersections, and other areas as directed by the Engineer.	Obtain sample from the contractor that represents the QC sample.	Testing and sampling only for dispute resolution.	-----
2) Compressive Strength Cores	Quality	Contractor must obtain two 4" diameter cores from the location in question and shall be delivered to the City Project Manager.	Obtain sample from the contractor that represents the QC sample.	Testing and sampling only for dispute resolution.	-----

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SECTION 5 – ASPHALTIC CONCRETE

ASPHALTIC CONCRETE

1. Asphalt shall be an approved mix design conforming to City of Lincoln Standard Specifications for Municipal Construction.
2. On the day of production testing lab personnel shall visit the asphalt plant and obtain the latest copy of the delivery ticket for the required asphaltic cement, plant settings, and for every 500 tons of asphaltic concrete or portion thereof of individual aggregate samples shall be obtained for sieve analysis.
3. Plants supplying asphalt for City projects shall submit mix designs and aggregate samples to the Quality Assurance testing lab, for all mix types to be used, at the beginning of each construction season and at least 14 days prior to production.
4. The City's Project Manager shall be notified by the Contractor 24 hours in advance of asphaltic concrete placement to allow time for scheduling of the Quality Assurance testing lab and to allow for plant material sampling. A QC/QA sample will be sampled by QC personnel under direct supervision and direction of the QA personnel, sample split and custody of split samples taken into each entities ownership.
5. Field sampling of asphaltic concrete shall be done by the QC testing lab on a lot basis, at the rate of one sample for each 500 tons placed or fraction thereof per day per mix type. Any placement smaller than 100 tons will be evaluated by the Engineer to determine if testing is required. A random sampling schedule for the QC sample ton will be generated by the QA personnel. This schedule will not be shared with the Contractor. If the amount of asphalt to be placed will not exceed 100 tons into the next lot, it will be represented by the previous lot's sample.
6. Sample asphalt from the mat immediately behind the paver prior to rolling. Follow the sampling schedule as close as possible for the sample ton, but do not sample in a return radius, or hand work area that is not representative of the bulk of the asphalt placed in the lot. The sample shall be representative of the required test load.
7. Sample is obtained by extracting a minimum of three full scoops from the mat with a square-nosed shovel (approx. 40 lb. – 45 lb.) and placing in a large double layered, paper grocery bag or in insulated container suitable for hot asphalt. Penetrate the mat as completely as possible, but do not get into the tack oil or sub-grade below the mat.
8. Measure the mat temperature at the sample location at time of sampling.

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9. Record the following information on the bag:
 - a. Project name and number
 - b. Date
 - c. Sample number
 - d. Sample ton
 - e. Mat temperature
 - f. Lift (e.g. Top, Middle, Bottom)
 - g. Lane (e.g. WB-O, West Bound Outside or NB-RT, North Bound Right Turn)
 - h. General Location (e.g. Pioneers Blvd., 150' East of 56th)
 - i. Stationing and Offset Left or Right from Centerline is required.

10. To maintain the sample temperature, testing personnel shall transport the sample as soon as possible to the testing lab.

11. After the rolling process is complete and within 2 calendar days of placement, and prior to allowing traffic, a density core shall be taken to represent each lot. The core shall be taken by the Contractor, in the presence of and located by the Construction Inspector, the core shall be cut completely through and into the original layer of material. Make sure that this location does not fall in a return radius or hand-work area that is not representative of the bulk of the asphalt placed in the lot. The QA testing lab Engineer shall take immediate custody of each density core after removal from the mat and deliver it to the Testing Lab.

12. If the density core does not meet the required density for 100% pay, two additional check cores shall be obtained by the Contractor within 7 days of placement. Check cores shall be taken within the same lot as the original core at locations designated by and in the presence of the Construction Inspector is described above. The average density of the original core and the two check cores shall be used to compute % pay. Cores will also be measured and reported to verify the thickness of the individual lifts.

13. If density core testing indicates pay deductions for any lot, the tonnage of that lot shall be obtained from the placement records and the deduct amount calculated from the bid price per ton as per City of Lincoln Standard Specifications.

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SAMPLING & TESTING PRIOR TO CONSTRUCTION

Minimum Material Certificate, Sample and Inspection Requirements					
MATERIAL	TYPE OF TEST	Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
PROVIDED 30 DAYS PRIOR TO CONSTRUCTION			QA LABORATORY	INDEPENDENT LABORATORY	
1) Asphalt Binder	Quality	Contractor must provide documentation indicating that the supplier is certified by NDOT to supply Performance Graded Binder in Nebraska.	Review contractor provided certification.	-----	2017 City of Lincoln Standard Specifications, Chapter 6Section 6.01
2) Tack Coats: Rapid-Curing Cut-Back Asphalts, Emulsified Asphalts	Quality	Contractor must provide documentation indicating that the supplier is certified by NDOT to supply Performance Graded Binder in Nebraska.	Review contractor provided certification.	-----	2017 City of Lincoln Standard Specifications, Chapter 6Section 6.01
3) Mineral Aggregates	Quality	Contractor must provide documentation indicating that the material meets requirements of 2017 City of Lincoln Standard Specifications. Contractor must retain an additional sample of each lot for possible QA testing.	Obtain sample from the contractor that represents the QC sample. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 6 Section 6.01C
4) Reclaimed Asphalt Pavement (RAP)	Quality	Contractor must provide documentation indicating that the material meets requirements of 2017 City of Lincoln Standard Specifications. Contractor must retain an additional sample of each lot for possible QA testing	Obtain material samples from the contractor that represents the QC sample. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 6 Section 6.01D

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Minimum Material Certificate, Sample and Inspection Requirements					
MATERIAL	TYPE OF TEST	Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
PROVIDE 30 DAYS PRIOR TO CONSTRUCTION			QA LABORATORY	INDEPENDENT LABORATORY	
5) Recycled Asphalt Shingles (RAS)	Quality	Contractor must provide documentation indicating that the material meets requirements of 2017 City of Lincoln Standard Specifications. Contractor must retain an additional sample of each lot for possible QA testing	Obtain material samples from the contractor that represents the QC sample. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 6 Section 6.01E.
6) Mix Design	Quality	Contractor must provide documentation indicating that the material meets requirements of 2017 City of Lincoln Standard Specifications. Contractor must retain an additional sample of each lot for possible QA testing.	Obtain material samples from the contractor that represents the QC sample. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	See 2017 City of Lincoln Standard Specifications, Chapter 6 Section 6.02.

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SAMPLING & TESTING DURING CONSTRUCTION

MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements			
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
Asphaltic Concrete Production Sampling and Testing			QA LABORATORY	INDEPENDENT LABORATORY	
1) Asphaltic Concrete Type SPH, SPR, SPX	Specific Gravity, Density, Bulk Specific Gravity, AC Binder Content, % Air Voids	A minimum of one sample for each lot. A lot is defined as each 500 tons or fraction thereof of each day's production Contractor must retain an additional sample of each lot for possible QA testing.	Obtain sample from the contractor that represents the QC sample. Frequency of test to be determined by City Project Manager	Testing and sampling for verification testing and dispute resolution as needed.	2017 City of Lincoln Standard Specifications, Chapter 6 Section 6.02
2) Asphaltic Concrete	Compaction Testing (Nuclear Gauge)	A minimum of four tests for each lot. A lot is defined as each 500 tons or fraction thereof of each day's production Contractor must provide test location to the City Project Manager immediately. for possible QA testing.	Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 6 Section 6.05B
3) Asphaltic Concrete (Cores)	CORE: Density, Air Voids	A minimum of one 4-inch core sample for each lot shall be taken no later than two days after the of placement in the presents of the City Inspector. A lot is defined as each 500 tons or fraction thereof of each day's production Contractor must retain an additional core sample of each lot for possible QA testing.	Obtain sample from the contractor that represents the QC sample. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 6 Section 6.05

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MATERIAL	TYPE OF TEST	Minimum Material Certificate, Sample and Inspection Requirements			
		Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
Asphaltic Concrete Production Sampling and Testing			FIELD PERSONNEL	INDEPENDENT LABORATORY	
4) Asphaltic Concrete Pavement	Surface Smoothness	Contractor performs all QC pavement smoothness testing specified in the 2017 City of Lincoln Standard Specifications and/or project special provisions. Contractor personnel will submit pavement smoothness results to the City Project Manager within 24 hours after final compacting	Approximately 10 percent of contractor's results may be randomly verified.	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 6, Subsection 6.04J. And contour irregularities shall not exceed 1/8-inch when tested with a 10-foot straightedge.

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SECTION 6 – GRANULAR MATERIALS

GRANULAR MATERIALS (Surfacing, Bedding, Foundation)

1. Granular materials shall meet all quality, physical, and chemical tests required by the project specifications. The Contractor shall be required to submit certifications of compliance to the City Project Manager.
2. These materials shall be sampled and tested by the QC Testing Lab for project specification compliance for gradation at the rate of one sample for every 250 tons or fraction thereof of material delivered to the project site. Samples shall conform to ASTM C 136 for size.
3. When required, moisture-density testing shall be done at the rate of one test for each 12-inch lift and at least 300 linear feet of pipe or two-lane pavement, or fraction thereof, per day. In cases of short sections or structure backfills, the number of tests is to be increased at the direction of the Engineer, to adequately represent the material in the fill. The material will be compacted to not less than 100% maximum dry density as determined by AASHTO Standard Method T-99.

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MATERIAL	TYPE OF TEST	Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
ROCK SURFACING			QA LABORATORY	INDEPENDENT LABORATORY	
1) Crushed Rock & Gravel	Quality	Contractor shall provide documentation indicating that the sources for crushed rock and gravel are be on the latest edition of the Nebraska Department of Transportation “Gravel and Rock Producers” list unless otherwise approved by the City’s Project Manager.	Review contractor provided documentation	-----	-----
2) Crushed Rock: Soundness, Abrasion	Quality	Contractor must provide documentation indicating that the supplied material is certified by NDOT to supply. Contractor must obtain an additional sample consisting of 60 pounds for possible QA testing.	Obtain sample from the contractor that represents the QC sample tested. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	AASHTO Method T-103; AASHTO Method T-96, Grade B
3) Moisture / Density Relationship	Quality	A minimum of one moisture/density relationship must be performed for each material type used on the project. Contractor must obtain an additional sample consisting of 60 pounds for possible QA testing.	Obtain sample from the contractor that represents the QC sample tested. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	AASHTO Standard Method T-99
4) Compaction	Quality	At elevations of least every 12-inches of fill placed and at the rate of one test for each 300 linear feet of two-lane pavement or 300 linear feet of utility trench, not to exceed 300 cubic yards of material placed, and with a minimum of one test per day to represent the work. Additional testing within smaller areas of construction may be required at the direction of the Construction Manager.	Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 2

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Minimum Material Certificate, Sample and Inspection Requirements					
MATERIAL	TYPE OF TEST	Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
BEDDING			QA LABORATORY	INDEPENDENT LABORATORY	
1) Crusher Run: Crushed Rock or Crushed Concrete	Quality	Contractor must provide documentation indicating the supplier and gradation of the material to be approved by the City Project Manager. Contractor must obtain an additional sample consisting of 60 pounds for possible QA testing.	Obtain sample from the contractor that represents the QC sample tested. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 20; Section 20.01D
2) Moisture / Density Relationship	Quality	A minimum of one moisture/density relationship must be performed for each material type used on the project. Contractor must obtain an additional sample consisting of 60 pounds for possible QA testing.	Obtain sample from the contractor that represents the QC sample tested. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	AASHTO Standard Method T-99
3) Compaction	Quality	At elevations of least every 12-inches of fill placed and at the rate of one test for each 300 linear feet of two-lane pavement or 300 linear feet of utility trench, not to exceed 300 cubic yards of material placed, and with a minimum of one test per day to represent the work. Additional testing within smaller areas of construction may be required at the direction of the Construction Manager.	Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 2

**CITY OF LINCOLN
QC/QA MATERIALS SAMPLING GUIDE
SECTION 6 – GRANULAR MATERIALS**

Minimum Material Certificate, Sample and Inspection Requirements					
MATERIAL	TYPE OF TEST	Q.C. SAMPLING AND TESTING BY CONTRACTOR	VERIFICATION SAMPLING AND TESTING BY QA LAB/CITY OF LINCOLN		LOCATION OF ADDITIONAL INFORMATION
FOUNDATION			QA LABORATORY	INDEPENDENT LABORATORY	
1) Aggregate	Quality	Contractor must provide documentation indicating the supplier and gradation of the material to be approved by the City Project Manager. Contractor must obtain an additional sample consisting of 60 pounds for possible QA testing.	Obtain sample from the contractor that represents the QC sample tested. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 20; Section 20.01C
2) Moisture / Density Relationship	Quality	A minimum of one moisture/density relationship must be performed for each material type used on the project. Contractor must obtain an additional sample consisting of 60 pounds for possible QA testing.	Obtain sample from the contractor that represents the QC sample tested. Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	AASHTO Standard Method T-99
3) Compaction	Quality	At elevations of least every 12-inches of fill placed and at the rate of one test for each 300 linear feet of two-lane pavement or 300 linear feet of utility trench, not to exceed 300 cubic yards of material placed, and with a minimum of one test per day to represent the work. Additional testing within smaller areas of construction may be required at the direction of the Construction Manager.	Frequency of test to be determined by City Project Manager	Testing and sampling only for dispute resolution.	2017 City of Lincoln Standard Specifications, Chapter 2