CITY OF LINCOLN
CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)

GENERAL.

Quality is more than test results. Quality is the combination of proper materials, testing, workmanship, equipment, inspection, and documentation of the project. Establishing and maintaining a culture of quality is key to achieving a quality project. The Contractor shall establish, provide, and maintain an effective Contractor Quality Control Program (CQCP) that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified here and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The Contractor shall establish a CQCP that will:

- Provide qualified personnel to develop and implement the CQCP.
- Provide for the production of acceptable quality materials.
- Provide sufficient information to assure that the specification requirements can be met.
- Document the CQCP process.

The Contractor shall describe the CQCP in a written document that shall be submitted to the City Engineer ***within 30 days after award of the contract*** for review and approval.

The CQCP shall be organized to address, as a minimum, the following:

- QC organization and resumes of key staff
- Project progress schedule
- Submittals schedule
- Inspection requirements
- QC testing plan
- Documentation of QC activities and distribution of QC reports
- Requirements for corrective action when QC and/or QA acceptance criteria are not met
- Material quality and construction means and methods. Address all elements applicable to the project that affect the quality of the pavement structure including subgrade, subbase, base, and surface course. Some elements that must be addressed include, but is not limited to mix design, aggregate grading, stockpile management, mixing and transporting, placing and finishing, quality control testing and inspection, smoothness, laydown plan, equipment, and temperature management plan.

The Contractor must add any additional elements to the CQCP that is necessary to adequately control all production and/or construction processes required by this contract.

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The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the CQCP has been reviewed and approved by the City Construction Engineer. No partial payment will be made for materials subject to specific quality control (QC) requirements until the CQCP has been reviewed and approved.

The QC requirements contained in this section and elsewhere in the contract technical specifications are in addition to and separate from the quality assurance (QA) testing requirements. QA testing requirements are the responsibility of the City Project Manager (CPM) or Contractor as specified in the specifications.

A Quality Control (QC)/Quality Assurance (QA) meeting with the Engineer, Project Manager (PM), Contractor, subcontractors, testing laboratories, and consultant must be held ***at least 15 business days prior*** to start of construction. ***The QC/QA meeting will be facilitated by the Contractor at the City of Lincoln's Office.*** The Contractor shall coordinate with the with the Engineer and Project Manager on time of the QC/QA meeting. Items to be addressed, at a minimum, will include:

- Review of the CQCP including submittals, QC Testing, Action & Suspension Limits for Production, Corrective Action Plans, Distribution of QC reports, and Control Charts.
- Discussion of the QA program.
- Discussion of the QC and QA Organization and authority including coordination and information exchange between QC and QA.
- Establish regular meetings to discuss control of materials, methods and testing.
- Establishment of the overall QC culture.

DESCRPITION OF PROGRAM.
The Contractor shall establish a CQCP to perform QC inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. The CQCP shall ensure conformance to applicable specifications and plans with respect to materials, off-site fabrication, workmanship, construction, finish, and functional performance. The CQCP shall be effective for control of all construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of QC.

CQCP ORGANIZATION.
The CQCP shall be implemented by the establishment of a QC organization. An organizational chart shall be developed to show all QC personnel, their authority, and how these personnel integrate with other management/production and construction functions and personnel.

The organizational chart shall identify all QC staff by name and function, and shall indicate the total staff required to implement all elements of the CQCP, including inspection and testing for

each item of work. If necessary, different technicians can be used for specific inspection and testing functions for different items of work. If an outside organization or independent testing laboratory is used for implementation of all or part of the CQCP, the personnel assigned shall be subject to the qualification requirements of paragraphs below. The organizational chart shall indicate which personnel are Contractor employees and which are provided by an outside organization.

The QC organization shall, as a minimum, consist of the following personnel:

a. Program Administrator. The Contractor Quality Control Program Administrator (CQCPA) must be a full-time employee of the Contractor, or a consultant engaged by the Contractor. The CQCPA must have a minimum of five (5) years of experience in QC construction materials testing and/or five 5 years of experience providing construction project management experience on a project of comparable size and scope as the contract.

Included in the five (5) years of experience, the CQCPA must meet at least one of the following requirements:

(1) Professional Engineer with one (1) year of field construction experience.
(2) Engineer-in-training with two (2) years of field experience.
(3) National Institute for Certification in Engineering Technologies (NICET) Civil Engineering Technology Level IV or an equivalent certification with three (3) years of field construction experience.
(4) An individual with four (4) years of field construction experience, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.
(5) An individual with eight (8) years of field construction experience.

The CQCPA must have full authority to institute any and all actions necessary for the successful implementation of the CQCP to ensure compliance with the contract plans and technical specifications. The CQCPA authority must include the ability to immediately stop production until materials and/or processes are in compliance with contract specifications. The CQCPA must report directly to a principal officer of the construction firm. The CQCPA may supervise the Quality Control Program on more than one project provided that person can be at the job site within two (2) hours after being notified of a problem.

b. QC technicians. A sufficient number of QC technicians necessary to adequately implement the CQCP must be provided. These personnel must be either Engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II in Civil Engineering Technology or higher, and shall have a minimum of two (2) years of field construction experience in their area of expertise.

The QC technicians must report directly to the CQCPA and shall perform the following functions:

(1) Inspection of all materials, construction, plant, and equipment for conformance to the technical specifications, and as required in the following Section – Inspection Requirements.
(2) Performance of all QC tests as required by the technical specifications and in the following Section – QC Testing Requirements.
(3) Performance of tests for the City Project Manager when required by the technical specifications.

Certification at an equivalent level of qualification and experience by a state or nationally recognized organization will be acceptable in lieu of NICET certification.

c. Staffing levels. The Contractor shall provide sufficient qualified QC personnel to monitor each work activity at all times. Where material is being produced in a plant for incorporation into the work, separate plant and field technicians shall be provided at each plant and field placement location. The scheduling and coordinating of all inspection and testing must match the type and pace of work activity. The CQCP shall state where different technicians will be required for different work elements.

PROJECT PROGRESS SCHEDULE.
Critical QC activities must be shown on the project schedule.

SUBMITTALS SCHEDULE.
Submittals shall be in accordance with the requirements of the City of Lincoln 2020 Standard Specifications, General Conditions, Section V Control of Work, Item I. Shop Drawing.

INSPECTION REQUIREMENTS.
QC inspection functions shall be organized to provide inspections for all definable features of work, as detailed below. All inspections shall be documented by the Contractor as specified in the following Section- Documentation.

Inspections shall be performed as needed to ensure continuing compliance with contract requirements until completion of the particular feature of work. Inspections shall include the following minimum requirements:

a. During plant operations for material production, QC test results and periodic inspections shall be used to ensure the quality of aggregates and other mix components, and to adjust and control mix proportioning to meet the approved mix design and other requirements of the technical specifications. All equipment used in proportioning and mixing shall be inspected to ensure its proper operating condition. The CQCP shall detail how these and other QC functions will be accomplished and used.

b. During field operations, QC test results and periodic inspections shall be used to ensure the quality of all materials and workmanship. All equipment used in placing, finishing, and compacting shall be inspected to ensure its proper operating condition and to ensure that all such operations are in conformance to the technical specifications and are within the plan dimensions, lines, grades, and tolerances specified. The CQCP shall document how these and other QC functions will be accomplished and used.

CONTRACTOR TESTING FACILITY.

The Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM D3666, *Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials*:

- 8.1.3 Equipment Calibration and Checks;
- 8.1.9 Equipment Calibration, Standardization, and Check Records;
- 8.1.12 Test Methods and Procedures

QC TESTING PLAN.

As a part of the overall CQCP, the Contractor shall implement a QC testing plan. The testing plan shall include the minimum tests and test frequencies required by each technical specification Item, as well as any additional QC tests that the Contractor deems necessary to adequately control production and/or construction processes.

The QC testing plan shall, as a minimum, include the following:

a. Specification item number (e.g., City of Lincoln, Nebraska, Standard Specifications, Chapter 6, Section 6.02 C)
b. Test type (e.g., gradation, grade, asphalt content)
d. Test standard (e.g., ASTM or American Association of State Highway and Transportation Officials (AASHTO) test number, as applicable)
e. Test frequency (e.g., as required by technical specifications or minimum frequency when requirements are not stated)
f. Responsibility (e.g., plant technician)
g. Control requirements (e.g., target, permissible deviations)

The QC testing plan shall contain a statistically-based procedure of random sampling for acquiring test samples in accordance with ASTM D3665. The City Project Manager shall be provided the opportunity to witness QC sampling and testing.

All QC test results shall be documented by the Contractor as required by Section – Documentation.

DOCUMENTATION.

The Contractor shall maintain current QC records of all inspections and tests performed. These records shall include factual evidence that the required QC inspections or tests have been

performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

These records must cover both conforming and defective or deficient features, and must include a statement that all supplies and materials incorporated in the work are in full compliance with the terms of the contract. Legible copies of these records shall be furnished to the RPR daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the CQCPA.

Contractor QC records required for the contract shall include, but are not necessarily limited to, the following records:

a. Daily inspection reports. Each Contractor QC technician shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations. These technician's daily reports shall provide factual evidence that continuous QC inspections have been performed and shall, as a minimum, include the following:

(1) Technical specification item number and description
(2) Compliance with approved submittals
(3) Proper storage of materials and equipment
(4) Proper operation of all equipment
(5) Adherence to plans and technical specifications
(6) Summary of any necessary corrective actions
(7) Safety inspection.
(8) Photographs

The daily inspection reports shall identify all QC inspections and QC tests conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed.

The daily inspection reports shall be signed by the responsible QC technician and the CQCPA. The City Project Manager shall be provided at least one copy of each daily inspection report on the work day following the day of record. When QC inspection and test results are recorded and transmitted electronically, the contractor must retain the test results until the final project payment.

b. Daily test reports. The Contractor shall be responsible for establishing a system that will record all QC test results. Daily test reports shall document the following information:

(1) Technical specification item number and description
(2) Test designation
(3) Location
(4) Date of test
(5) Control requirements
(6) Test results
(7) Causes for rejection

(8) Recommended remedial actions
(9) Retests

Test results from each day's work period shall be submitted to the CPM prior to the start of the next day's work period. When QC daily test results are recorded and transmitted electronically, the contractor must retain the test results until the final project payment.

CORRECTIVE ACTION REQUIREMENTS.
The CQCP shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of control (out of tolerance) and detail what action will be taken to bring the process into control. The requirements for corrective action shall include both general requirements for operation of the CQCP as a whole, and for individual items of work contained in the technical specifications.

The CQCP shall detail how the results of QC inspections and tests will be used for determining the need for corrective action and shall contain clear rules to gauge when a process is out of control and the type of correction to be taken to regain process control.

When applicable, the Contractor may establish and use statistical QC charts for individual QC tests. The requirements for corrective action shall be linked to the control charts.

INSPECTION BY THE CITY PROJECT MANAGER.
Inspections by City Project Manager (CPM) or other public authorities having jurisdiction shall inspect work in accordance with City of Lincoln Standard Specifications.

Inspection by the CPM does not relieve the Contractor of performing QC inspections of either on-site or off-site Contractor's or subcontractor's work.

NONCOMPLIANCE.
a. The City Project Manager (CPM) will provide written notice to the Contractor of any noncompliance with their CQCP. After receipt of such notice, the Contractor must take corrective action.

b. When QC activities do not comply with either the CQCP or the contract provisions or when the Contractor fails to properly operate and maintain an effective CQCP, and no effective corrective actions have been taken after notification of non-compliance, the CPM will recommend the following actions:

(1) Order the Contractor to replace ineffective or unqualified QC personnel or subcontractors and/or

(2) Order the Contractor to stop operations until appropriate corrective actions are taken.

BASIS OF MEASUREMENT AND PAYMENT.

Contractor Quality Control Program (CQCP) is for the personnel, tests, facilities and documentation required to implement the CQCP. The CQCP will be paid as a lump sum with the following schedule of partial payments:]

a. With the first pay estimate, 25% with approval of CQCP and completion of the Quality Control (QC)/Quality Assurance (QA) meeting.

b. When 25% or more of the value of Work has been completed, an additional 25%.

c. When 50% or more of the value of Work has been completed, an additional 20%.

d. When 75% or more of the value of Work has been completed, an additional 20%

e. After final inspection and acceptance of the Work per City of Lincoln Standard Specifications for Municipal Construction Section VIII.C, the final 10%.