

REQUEST FOR QUALIFICATIONS
For
GREENVILLE TRANSPORTATION ACTIVITY
CENTER
SPECIAL INSPECTIONS/TESTING



Greenville
NORTH CAROLINA

Find yourself in good company

CITY OF GREENVILLE, NC
PUBLIC WORKS DEPARTMENT
1500 BEATTY STREET
GREENVILLE, NC 27834
252-329-4480

REQUEST FOR QUALIFICATIONS (RFQ)
(Advertisement)

The City of Greenville, NC, is seeking proposals from qualified engineering/testing firms interested in providing special inspection services for the Greenville Transportation Activity Center project. Services will include inspections and verification of cast-in-place concrete, precast concrete, masonry construction, structural steel, asphaltic concrete paving, exterior enclosure, soils, and roofing and waterproofing. The special inspection services are required by the NC building code for this type of structure. The special inspector shall keep records of inspections and shall furnish inspection reports to the building official, owner and to the registered design professional in responsible charge.

The intent of this RFQ is to select an engineering/testing firm to provide special inspection services for the Greenville Transportation Activity Center project.

The complete RFQ can be obtained from the City's website at www.greenvillenc.gov.

Interested firms are invited to submit proposals (in the required quantity and format) by 2:00 p.m., Thursday, September 8, 2016, to the following address:

Mr. Kenneth Jackson
Operations Manager
City of Greenville
Public Works Department
1500 Beatty Street
Greenville, NC 27834

REQUEST FOR QUALIFICATIONS (RFQ) FOR SPECIAL INSPECTION SERVICES

**Public Works Department
City of Greenville, North Carolina
August 2016**

I. Overview and Purpose

The City of Greenville is planning to construct the Greenville Transportation Activity Center, beginning in October or November of 2016. The NC Building Code requires special inspections for buildings of this type. At this time, the City is looking for firms with specific and proven expertise and experience in the following areas of special inspections/testing.

- Cast-in-place concrete
- Pre-cast concrete
- Masonry
- Structural steel
- Asphaltic concrete paving
- Exterior Enclosure
- Soils
- Roofing and waterproofing

The intent of this RFQ is to select the most qualified Engineering/Testing Firm to provide special inspection services for the Greenville Transportation Activity Center project.

Special inspection services will be required throughout the duration of the construction phase of the project, which is expected to commence in October or November of 2016 and be completed in November of 2017.

II. Background Information

The Greenville Transportation Activity Center will be a centrally located transfer facility where all local and regional transportation services will connect. The

Greenville Area Transit system (GREAT bus system), Pitt Area Transit (PATs), ECU Transit, and Greyhound will all utilize the facility for connections along with taxis and the new Amtrak Connector. Airport, medical, and hotel shuttles could locate there with future rail service also a possibility. The Center will also provide a covered transfer facility with seating, restrooms and more, giving people a choice of transportation options to fit their needs and meet the needs of our growing population for the next 20-30 years.

This project is bounded by Bonners Lane on the North, Clark Street on the West, and S. Pitt Street on the East.

III. Scope of Work

- The special inspector shall provide all of the inspection services listed in the Required Special Inspections section of the contract documents. (Attachment B)
- The special inspector shall be available to the project within 24 hour notice from either the Contractor or Owner.
- The special inspector shall keep records of inspections and shall furnish inspection reports to the building official, owner and to the registered design professional in responsible charge.
- Reports shall indicate that work inspected was done in conformance to approved construction documents. Discrepancies shall be brought to the immediate attention of the contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the building official and to the registered design professional in responsible charge prior to the completion of that phase of work.
- Attend mandatory pre-construction meeting and any other meetings where special inspector is required.

IV. Schedule for Consultant/s Selection

The tentative schedule for selecting a Firm for special inspections is outlined below. The actual schedules may vary.

Submit Qualifications	September 8, 2016 by 2 p.m.
Selection of Firm	September 20, 2016
Contract Negotiations Complete	September 26 2016
Contract Awarded	October 10, 2016

V. RFQ Requirements

The following information should be included in the qualifications package:

- Brief Corporate Profile
- Corporate/Team Experience on Similar Projects
- Project Management – experience and availability
- Field Personnel – experience in each testing area required and availability

Rates for services will be established during contract negotiations with the selected firm. Cost estimates are not required for submission of RFQ.

VI. Selection Criteria

Criteria for the selection of the Engineering/Testing Firm will include, but not necessarily be limited to, the following:

- Quality of response to the RFQ (10%);
- Applicable experience of firm and/or team proposed by the firm (30%);
- Qualifications of individual(s) proposed for the duties (30%); and
- Availability of key personnel (30%)

The selection team will consist of the Public Works Director, the Public Works Operations Manager, the Transit Manager, and the City Engineer. The team will evaluate the RFQ's based on the aforementioned items and corresponding percentages. The City intends to select one Firm based on qualifications and begin contract negotiations.

VII. Supervision of Consultant

The Engineering/Testing Firm will be under the supervision of the Public Works Operations Manager, or his designee.

VIII. Proposal Submission and Deadline

Interested firms are invited to submit four (4) paper copies and one digital copy of its response to this RFQ no later than 2:00 pm, September 8, 2016, to the following address:

Mr. Kenneth Jackson
Operations Manager
City of Greenville
Public Works Department
1500 Beatty Street
Greenville, NC 27834

For questions regarding this Request for Qualifications, contact Kenneth Jackson at (252) 329-4480 or kjackson@greenvillenc.gov

IX. State Requirements

E-VERIFY COMPLIANCE: The Contractor shall comply with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes. Further, if the Contractor utilizes a Subcontractor, the Contractor shall require the Subcontractor to comply with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes. By submitting a proposal, The Proposer represents that their firm and its Subcontractors are in compliance with the requirements of Article 2 Chapter 64 of the North Carolina General Statutes.

IRAN DIVESTMENT ACT: Vendor certifies that; (i) it is not identified on the Final Divestment List or any other list of prohibited investments created by the NC State Treasurer pursuant to N.C.G.S. 143-6A-4; (ii) it will not take any actions causing it to appear on any such list during the term of this Purchase Order, and (iii) it will not utilize any subcontractor to provide goods and services hereunder that is identified on any list.

Vendors are to complete certification on the next page and submit it as part of the proposal submitted.

**IRAN DIVESTMENT ACT CERTIFICATION REQUIRED BY N.C.G.S.
147-86.59(a)**

Name of Contractor, Vendor or Bidder: _____

The contractor, vendor, or bidder listed above hereby certifies that it is not on the Iran Final Divestment List created by the North Carolina State Treasurer pursuant to N.C.G.S. 147-86.58. The contractor, vendor, or bidder listed above will not utilize on the contract with the City Of Greenville any subcontractor that is listed on the Iran Final Divestment List created by the North Carolina State Treasurer pursuant to N.C.G.S. 147-86.58.

The undersigned hereby certifies that he or she is authorized by the contractor, vendor or bidder listed above to make the foregoing statement.

Signature _____ Date _____

Printed Name _____ Title _____

Notes to persons signing this form:

N.C.G.S. 147-86.59(a) requires this certification for bids or contracts with the State of North Carolina, a North Carolina local government, or any other political subdivision of the State of North Carolina. The certification is required at the following times:

- When a bid is submitted
- When a contract is entered into (if the certification was not already made when the vendor made its bid)
- When a contract is renewed or assigned

N.C.G.S. 147-86.59(b) requires that contractors with the State, a North Carolina local government, or any other political subdivision of the State of North Carolina must not utilize any subcontractor found on the State Treasurer's Final Divestment List. The State Treasurer's Final Divestment List can be found on the State Treasurer's website at the address www.nctreasurer.com/Iran and will be updated every 180 days.

ATTACHMENT A
(Required Federal Clauses)

No Obligation by the Federal Government.

1. The City and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying Contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this Contract and shall not be subject to any obligations or liabilities to the City, Contractor, or any other party (whether or not a party to that Contract) pertaining to any matter resulting from the underlying Contract.

2. The Contractor agrees to include the above clause in each subContract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the sub-Contractor who will be subject to its provisions.

Program Fraud and False or Fraudulent Statements or Related Acts.

1. The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. § 3801 *et seq.* and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 C.F.R. Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying Contract, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying Contract or the FTA assisted project for which this Contract work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the Federal Government deems appropriate.

2. The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a Contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. § 5307, the Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5307(n)(1) on the Contractor, to the extent the Federal Government deems appropriate.

3. The Contractor agrees to include the above two clauses in each subContract financed in whole or in part with Federal assistance provided by FTA. It is further

agreed that the clauses shall not be modified, except to identify the sub-Contractor who will be subject to the provisions.

Access to Records

The following access to records requirements apply to this Contract:

1. The Contractor agrees to provide the City, the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives access to any books, documents, papers and records of the Contractor which are directly pertinent to this Contract for the purposes of making audits, examinations, excerpts and transcriptions. Contractor also agrees, pursuant to 49 C.F.R. 633.17 to provide the FTA Administrator or his authorized representatives including any PMO Contractor access to Contractor's records and construction sites pertaining to a major capital project, defined at 49 U.S.C. 5302(a)1, which is receiving federal financial assistance through the programs described at 49 U.S.C. 5307, 5309 or 5311.
2. The Contractor shall make available records related to the Contract to the City, the Secretary of Transportation and the Comptroller General or any authorized officer or employee of any of them for the purposes of conducting an audit and inspection.
3. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.
4. The Contractor agrees to maintain all books, records, accounts and reports required under this Contract for a period of not less than three years after the date of termination or expiration of this Contract, except in the event of litigation or settlement of claims arising from the performance of this Contract, in which case Contractor agrees to maintain same until the City, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto. Reference 49 CFR 18.39(i)(11).

Federal Changes

Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between City and FTA, as they may be

amended or promulgated from time to time during the term of this Contract. Contractor's failure to so comply shall constitute a material breach of this Contract.

Termination for Convenience or Default (Architect and Engineering)

The City may terminate this Contract in whole or in part, for the City's convenience or because of the failure of the Contractor to fulfill the Contract obligations. The City shall terminate by delivering to the Contractor a Notice of Termination specifying the nature, extent, and effective date of the termination. Upon receipt of the notice, the Contractor shall (1) immediately discontinue all services affected (unless the notice directs otherwise), and (2) deliver to the City all data, drawings, specifications, reports, estimates, summaries, and other information and materials accumulated in performing this Contract, whether completed or in process.

If the termination is for the convenience of the City, the City shall make an equitable adjustment in the Contract price but shall allow no anticipated profit on unperformed services.

If the termination is for failure of the Contractor to fulfill the Contract obligations, the City may complete the work by contract or otherwise and the Contractor shall be liable for any additional cost incurred by the City.

If, after termination for failure to fulfill Contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the City.

Civil Rights

The following requirements apply to the underlying Contract:

(1) Nondiscrimination - In accordance with Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

(2) Equal Employment Opportunity - The following equal employment opportunity requirements apply to the underlying Contract:

(a) Race, Color, Creed, National Origin, Sex - In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, and Federal transit laws at 49 U.S.C. § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. Parts 60 et seq., (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e note), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect construction activities undertaken in the course of the Project. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(b) Age - In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. § § 623 and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(c) Disabilities - In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act," 29 C.F.R. Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(3) The Contractor also agrees to include these requirements in each sub Contract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.

Disadvantaged Business Enterprises

This Contract is subject to the requirements of Title 49, Code of Federal Regulations, Part 26, Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs. The agency's overall goal for DBE participation is 8.39%. A separate Contract goal this procurement has not been established.

The Contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of this DOT-assisted Contract. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the City deems appropriate. Each sub Contract the Contractor signs with a sub-Contractor must include the assurance in this paragraph (*see* 49 CFR 26.13(b)).

Incorporation of Federal Transit Administration (FTA) Terms

The preceding provisions include, in part, certain Standard Terms and Conditions required by DOT, whether or not expressly set forth in the preceding Contract provisions. All Contractual provisions required by DOT, as set forth in FTA Circular 4220.1E, are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Agreement. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any City requests which would cause the City to be in violation of the FTA terms and conditions.

Suspension and Debarment

This Contract is a covered transaction for purposes of 49 CFR Part 29. As such, the Contractor is required to verify that none of the Contractor, its principals, as defined at 49 CFR 29.995, or affiliates, as defined at 49 CFR 29.905, are excluded or disqualified as defined at 49 CFR 29.940 and 29.945. The Contractor is required to comply with 49 CFR 29, Subpart C and must include the requirement to comply with 49 CFR 29, Subpart C in any lower tier covered transaction it enters into.

By signing and submitting its bid or proposal, the bidder or proposer certifies as follows:

The certification in this clause is a material representation of fact relied upon by the City. If it is later determined that the bidder or proposer knowingly rendered an erroneous certification, in addition to remedies available to the City, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

The bidder or proposer agrees to comply with the requirements of 49 CFR 29, Subpart C while this offer is valid and throughout the period of any Contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

Disputes

Disputes arising in the performance of this Contract which are not resolved by agreement of the parties shall be decided in writing by the authorized representative of City's Public Works Director. This decision shall be final and conclusive unless within ten (10) days from the date of receipt of its copy, the Contractor mails or otherwise furnishes a written appeal to the City's City Manager. In connection with any such appeal, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its position. The decision of the City Manager shall be binding upon the Contractor and the Contractor shall abide by the decision.

Performance During Dispute

Unless otherwise directed by the City, Contractor shall continue performance under this Contract while matters in dispute are being resolved.

Claims for Damages

Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the party or of any of his employees, agents or others for whose acts he is legally liable, a claim for damages therefor shall be made in writing to such other party within a reasonable time after the first observance of such injury or damage.

Remedies

Unless this Contract provides otherwise, all claims, counterclaims, disputes and other matters in question between the City and the Contractor arising out of or relating to this agreement or its breach will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the State of North Carolina.

Rights and Remedies

The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law. No action or failure to act by the City, or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

Byrd Anti-Lobbying Amendment, 31 U.S.C. 1352, as amended by the Lobbying Disclosure Act of 1995, P.L. 104-65 [to be codified at 2 U.S.C. § 1601, et seq.]

Contractors who apply or bid for an award of \$100,000 or more shall file the certification required by 49 CFR part 20, "New Restrictions on Lobbying." Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal Contract, grant or any other award covered by 31 U.S.C. 1352. Each tier shall also disclose the name of any registrant under the Lobbying Disclosure Act of 1995 who has made lobbying contacts on its behalf with non-Federal funds with respect to that Federal Contract, grant or award covered by 31 U.S.C. 1352. Such disclosures are forwarded from tier to tier up to the recipient.

Clean Air

(1) The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 et seq. The Contractor agrees to report each violation to the City and understands and

agrees that the City will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.

(2) The Contractor also agrees to include these requirements in each sub Contract exceeding \$100,000 financed in whole or in part with Federal assistance provided by FTA.

Clean Water

(1) The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq. The Contractor agrees to report each violation to the City and understands and agrees that the City will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.

(2) The Contractor also agrees to include these requirements in each sub Contract exceeding \$100,000 financed in whole or in part with Federal assistance provided by FTA.

Seismic Safety

The Contractor agrees that any new building or addition to an existing building will be designed and constructed in accordance with the standards for Seismic Safety required in Department of Transportation Seismic Safety Regulations 49 CFR Part 41 and will certify to compliance to the extent required by the regulation. The Contractor also agrees to ensure that all work performed under this Contract including work performed by a sub-Contractor is in compliance with the standards required by the Seismic Safety Regulations and the certification of compliance issued on the project.

Energy Conservation

The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act.

ADA Access

The Contractor agrees to comply with: 49 U.S.C 5301(d), which states the Federal policy that elderly individuals and individuals with disabilities have the same right

as other individuals to use public transportation services and facilities, and that special efforts shall be made in planning and designing those services and facilities to implement transportation accessibility rights for elderly individuals and individuals with disabilities; all applicable provisions of section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. 794, which prohibits discrimination on the basis of disability; the Americans with Disabilities Act of 1990 (ADA), as amended, which requires that accessible facilities and services be made available to individuals with disabilities; and the Architectural Barriers Act of 1968, as amended, which requires that buildings and public accommodations be accessible to individuals with disabilities.

All deliverables items provided by the Contractor to the City under this Contract shall comply with the above-referenced laws as well as all other applicable federal, state and local regulations and directives and any subsequent amendments thereto.

ATTACHMENT B

(Required Special Inspection Services)

Part 1 General

1.1 Summary (Non-inclusive)

- A. Section Includes: Contractual and procedural requirements related to independent Inspection and Testing Agencies including:
 - 1. Contractual requirements for retaining Agencies.
 - 2. Contractor's responsibilities for coordinating and cooperating with Agencies.
 - 3. Procedural requirements for Agencies.

1.2 Related Work Specified Elsewhere (Non-inclusive)

- A. Applicable Sections: Division 01.
- B. Cutting and Patching: Division 01.
- C. Inspection and Testing Services are specified in the following locations:
 - 1. Inspection and Testing of Earthwork: Division 01.
 - 2. Inspection and Testing of Cast-In-Place Concrete: Division 01.
 - 3. Inspection and Testing of Asphaltic Concrete: Division 01.
 - 4. Inspection and Testing of Masonry: Division 01.
 - 5. Inspection and Testing of Roofing and Waterproofing: Division 01.
 - 6. Inspection and Testing of Exterior Enclosure: Division 01.
- D. Methods and Means Engineering: Division 01.
- E. Testing and Balancing of Mechanical Systems: Division 01.

1.3 Submittals

- A. Submit per the requirements of Division 01.
- B. Quality Control Procedures:
 - 1. Test Facility Inspection Reports: As indicated.

2. Field Inspection Reports: No later than one week after inspection or test, unless otherwise indicated.
3. Field Test Reports: As indicated.

C. Certifications: As indicated.

1.4 Definitions

A. Agency: An independent Inspection and Testing Agency qualified for work as indicated.

1.5 Quality Assurance

A. Agency's Qualifications:

1. Agency shall have been in business for a minimum of five years. Agency shall have successfully completed five projects of scope and complexity similar to this Project in last three years. Submit certification.
2. Comply with basic requirements of ASTM E329, "Standard Specification for Agencies Engaged in Construction Inspection and/or Testing".
3. Authorized to operate in the state of North Carolina.
4. Confirm objectivity by disclosing possible conflicts of interest.
5. Maintain adequate equipment to perform required tests that has been periodically calibrated.
6. Employ experienced personnel educated in conducting, supervising and evaluation tests and/or inspections.

1.6 Contractual Requirements

A. Owner will directly retain services of independent Inspection and Testing Agency required in individual Inspection and Testing Sections of Division 01. Individual Inspection and Testing Sections are included in Project Manual for Contractor's coordination with Agency.

1.7 Inspection And Testing Agency's Responsibilities

- A. Cooperate with Owner's Representative, Design Professional, and Contractor, and furnish services of qualified personnel after due notice.
- B. Perform indicated inspections, sampling and testing of materials and methods of construction:
 1. Comply with specified standards.
 2. Verify compliance of materials with requirements of Contract Documents.
- C. Keep records of inspections.

- D. Promptly notify Design Professional, and Contractor of observed irregularities or deficiencies of Work or Products.
- E. Submit written report of each field inspection and test. Each report shall include:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Testing laboratory name, address and telephone number.
 - 4. Name and signature of laboratory or field inspector.
 - 5. Date and time of sampling or inspection.
 - 6. Record of temperature and weather conditions.
 - 7. Date of test.
 - 8. Identification of product and Specification Section.
 - 9. Location of Sample or Test in the Project.
 - 10. Type of inspection or test.
 - 11. Results of tests and compliance with Contract Documents.
 - 12. Interpretation of test results, when requested.
- F. When reinspection or retesting at Contractor's expense is required, perform reinspection and retesting in conformance with requirements for original inspection and testing.
- G. Submit final report documenting required inspections and correction of any discrepancies noted in the inspections.

1.8 Limitations Of Authority Of Inspection And Testing Agency

- A. Agency is not authorized to:
 - 1. Release, revoke, alter or enlarge on requirements of Contract Documents.
 - 2. Approve or accept any portion of Work.
 - 3. Perform Contractor's work.

1.9 Contractor's Responsibilities

- A. Cooperate with Agency, and enable access to Work and to manufacturers' operations.
- B. Furnish Agency mix design(s) and material Samples proposed to be used which require control by Inspection and Testing Agency.

- C. Furnish copies of Product Test Reports as required.
- D. Furnish incidental labor and facilities:
 - 1. To enable access to Work to be tested.
 - 2. To facilitate inspection and tests.
 - 3. For storage and curing of test Samples.
- E. Notify Agency in advance of operations to allow for Agency assignment of personnel and scheduling of tests. When inspections or tests cannot be performed after such notice, reimburse Owner for Agency personnel and travel expenses incurred.
- F. If initial inspections and tests indicate Work does not comply with Contract Documents, pay Construction Manager for such additional inspection and testing services as may be required until Work conforms with Contract Documents.
- G. Employ and pay for services of a separate, equally qualified independent Agency to perform additional inspections, testing and sampling for Contractor's convenience.

Part 2 Products

Not used.

Part 3 Execution

3.1 Repair And Protection

- A. General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction, and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with requirements in Cutting and Patching: Division 01.

END

Part 1 General

1.1 Summary (Non-inclusive)

A. Section Includes: Inspection and Testing Agency shall perform inspection and testing of earthwork and related construction to ascertain conformance with Contract Documents and as follows:

1. By Soils Engineer:
 - a. Inspect subgrade intended for support of structures, slab-on-ground and pavements.
 - b. Review equipment and methods used in placement and compaction of fill materials.
 - c. Notify Design Professional immediately if footings or slab-on-ground are placed on unfinished soil or frozen ground or when footings and slabs-on-grade are not protected from frost damage.
 - d. Notify Design Professional when subgrade with allowable bearing noted is encountered at elevation above bearing elevation indicated.
 - e. Notify Design Professional and Contractor if subgrade with required allowable bearing capacity is not encountered at bearing elevation indicated. Foundation shall be adjusted as recommended in writing by Soils Engineer and approved in writing by Design Professional.
 - f. Review rock excavation techniques. Monitor extent of rock removal so as to preclude overexcavation. Verify that specified definition of rock is being used. Monitor blasting-induced ground motions.
 - g. Monitor settlements and lateral movements of existing adjacent construction.
2. By Soils Technician:
 - a. Inspection of filling, backfilling of structures and trenchwork.
 - b. Testing work.
 - c. Monitoring of temporary drainage, pumping and dewatering systems.
 - d. Inspection of installation of perimeter subdrainage system.

1.2 Related Work Specified Elsewhere (Non-inclusive)

- A. Applicable Sections: Division 01.
- B. Inspection and Testing Services: Division 01, refer to for contractual requirements to retain Agency.
- C. Earth Moving: Division 31.

1.3 Submittals

- A. Submit per the requirements of Division 01.
- B. Quality Control Procedures:
 1. Field Inspection Reports: As indicated.

2. Field Test Reports: Reports to include the following:
 - a. Type and condition of subgrade at foundation bearing.
 - b. Level of water table in excavated areas.
 - c. Grain size distribution of fill materials (average of three tests.)
 - d. Moisture and density test results.
 - e. Field density test results with moisture content and relative density of each layer of compacted fill. Include, with field density test results, a plan indicating location of each test.
 - f. Notify Design Professional by telephone within one hour of discovery of the following conditions, and follow up telephone notification with written report:
 - 1) Materials used, existing conditions found, or degree of soil compaction not meeting specified requirements.
 - 2) Frost and freeze protection requirements for excavation bottoms not being complied with.

- C. Certifications: Based on results of inspections and tests performed, certify that Work has been performed in conformance with Contract Documents. Certification shall be signed and sealed by a Professional Engineer trained and specializing in field of geotechnical engineering and licensed in North Carolina.

1.4 Quality Assurance

- A. Inspection and testing work shall be by a Soils Engineer, trained and specializing in field of geotechnical engineering.
- B. Soils Technician shall have a minimum of five years experience on similar type work.
- C. Work of the Soils Technician shall be under direct supervision of Soils Engineer.
- D. Inspection and Testing shall be under supervision of Professional Engineer in responsible charge of Inspection and Testing.
- E. Referenced Codes and Standards: Comply with the following in accordance with Division 01.
 1. ASTM International (ASTM)

C 136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
D 1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
D 1557	Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³)
D 6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil- Aggregate by Nuclear Methods (Shallow Depth)
D 4318	Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
 2. U.S. Army Corps of Engineers

EM 1110-2-1906	Modified Providence Vibrated Density Test
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Part 2 Products

Not used.

Part 3 Execution

3.1 Repair and Protection

- A. Inspect subgrade at each foundation bearing and at all pavement and fill conditions for conformance to specified requirements.
- B. Inspect installation of perimeter drainage system for conformance to specified materials and detail requirements.
- C. When temporary drainage and dewatering systems are used to keep excavation dry, monitor the systems for adequacy.
- D. Inspect materials and methods used for placement and compaction of fills in general earthwork and also in backfilling around structures and in utility trenches.
- E. Inspect prepared subgrades under slabs-on-grade and pavements.

3.2 Testing

- A. Perform sieve analysis according to ASTM C 136, prior to initiation of and every other week during filling operations, to develop grain-size distribution curves for materials used for subgrade, fill under slabs-on-grade and backfill.
- B. Establish moisture-density relation of soils to be used as fill according to ASTM D 1557 by Method A, B, C or D, using method best suited to type of fill material.
- C. Perform field density tests according to ASTM D 1556 at each layer of compacted fill at locations adequate to evaluate degree of compaction of all fill areas. There shall be at least one test at each layer for each 1000 square feet with a maximum spacing of 50 feet between test locations.
- D. Perform field density tests according to EM 1110-2-1906 at compacted porous fill under slabs-on-grade. There shall be at least one test for each 2000 square feet of slab area.

3.3 Inspection

- A. Periodically verify materials below footings are adequate to achieve the design bearing capacity.
- B. Periodically verify excavations are extended to proper depth and have reached proper material.
- C. Periodically perform classification and testing of controlled fill materials.
- D. Continuously verify use of proper materials, densities and lift thicknesses during placement and compaction of controlled fill.

- E. Periodically, prior to placement of controlled fill, observe subgrade and verify that site has been prepared properly.

END

Section 014533**Inspection And Testing Of Cast-In-Place
Concrete****Part 1 General****1.1 Summary (Non-inclusive)**

- A. Section Includes: Inspection and Testing Agency shall perform inspection of batch plant concrete, field cast-in-place concrete, concrete formwork, reinforcement, accessories, and concrete placement to verify conformance with Contract Documents.

1.2 Related Work Specified Elsewhere (Non-inclusive)

- A. Applicable Sections: Division 01.
- B. Inspection and Testing Services: Division 01, refer to for contractual requirements to retain Agency.
- C. Concrete Formwork: Division 03.
- D. Concrete Reinforcement: Division 03.
- E. Concrete Accessories: Division 03.
- F. Cast-In-Place Concrete: Division 03.
- G. Polished Concrete Finishing: Division 03.

1.3 Submittals

- A. Submit per the requirements of Division 01.
- B. Quality Control Procedures:
 - 1. Field Test Reports to include the following:
 - a. Specific element(s) being inspected such as floor, roof, wall or column. Designate by floor level, structural bay or other appropriate means.
 - b. Concrete test reports shall include the following:
 - 1) Specific place of deposit of concrete being tested as to floor, roof, wall or column. Designate by floor level, structural bay or other appropriate means.
 - 2) Specified 28 day strength, unit weight, slump, air content, and water-cement ratio of concrete being tested.
 - 3) Minimum air temperature and average daily air temperature on day of placement.
 - 4) Concrete and subgrade temperatures prior to, during and after placement. Describe methods and procedures used for protecting subgrade and concrete.
 - 5) Volume of concrete represented by test.

- 6) Results of slump test, air content test and unit weight test.
- 7) Name of concrete supplier, and time of batching, delivery and placement.
- c. Historical reports of concrete strength performance weekly as specified herein.
- d. Reports shall clearly indicate compliance/non-compliance of inspected element(s) with respect to Contract Documents. "Non-compliance" reports shall be rectified and superseded by a "compliance" report to satisfaction of Design Professional.

C. Certifications: Separate certification stating that, based on results of inspection and testing performed, cast-in-place concrete work has been constructed in conformance with Contract Documents. Certification shall be signed and sealed by a Professional Engineer trained and specializing in field of structural engineering and registered in North Carolina.

1.4 Quality Assurance

A. Referenced Codes and Standards: Comply with the following in accordance with Division 01.

1. American Concrete Institute (ACI)

311.4R Guide for Concrete Inspection

318 Building Code Requirements for Structural Concrete

B. Perform inspection work specified under direct supervision of Professional Engineer submitting Certification.

C. Inspection Work indicated shall be performed by a graduate engineer, educated and specializing in field of Structural Engineering.

D. Field and laboratory testing technicians shall be ACI-certified for level of Work being performed.

E. Laboratory Qualifications:

1. Submit copy of report of inspection of facilities made by Construction Materials Reference Laboratory (CMRL) during most recent tour of inspection, with memorandum of remedies of deficiencies reported by inspection.

2. Testing equipment shall be calibrated at NIST or manufacturer's written recommended intervals by devices of accuracy traceable to either:

- a. National Institute of Standards and Technology (NIST).
- b. Accepted values of natural physical constants.

Part 2 Products

Not used.

Part 3 Execution

3.1 Batch Plant Inspection

- A. Upon submittal of mix designs for approval, test materials sampled from batch plant for compliance with Reference Standards and conformance with materials listed in concrete mix design. Perform the following minimum testing:
 - 1. Cement (ASTM C 150):
 - a. Fineness: ASTM C 204.
 - b. Compressive Strength (7 day and 28 day): ASTM C 109/109M and ASTM C 917.
 - 2. Aggregate (ASTM C 33, ASTM C 330):
 - a. Grading and Fineness: ASTM C 136.
 - b. Organic Impurities (fine aggregate only): ASTM C 40.
- B. On first day's batching of each Class of concrete and monthly through course of Work, inspect and test materials, batch weights, moisture content, and gradation of fine and coarse aggregate. Sample materials directly from supplier's stockpiles and test for uniformity as above specified.

3.2 Field Inspection

- A. Inspect formwork for ties, finishes and general tightness of joints. Contractor shall design, construct and brace formwork.
- B. Inspect concrete reinforcing for quantity, size, type, spacing, splices and placement. Inspect reinforcing using Design Professional approved Shop Drawings.
- C. Inspect concrete accessories and inserts for quantity, size, manufacture, type, spacing and placement.
- D. Inspect method of placing, vibrating and curing of concrete.
- E. Inspect cold-weather protection methods.
- F. Inspect grouting under base plates to verify material, method and timing of placement.

3.3 Field And Laboratory Testing

- A. Slump Tests: ASTM C 143/143M; one test shall be performed for each sampling for strength tests. Slump shall be considered acceptable if field test is within range of design slump plus or minus 1 inch. For concrete placed by pumping, test shall be performed at pump or truck discharge. Slump measured shall be evaluated for acceptance relative to design slump in accordance with criteria previously specified.
- B. Air Content Tests: ASTM C 173/173M; test air-entrained concrete only, one test performed for each sampling for strength tests. Air content shall be considered acceptable if field test is within range of design air content plus or minus 1.5 percent.

- C. Unit Weight Tests: ASTM C 138; test each Sample of lightweight concrete taken for strength tests. Unit weight shall be considered acceptable if field test shows a plastic unit weight equal to design unit weight plus or minus 2 pcf.
- D. Compression Test Cylinders:
1. Make, transport, cure and test 6 inch diameter by 12 inch long test specimens taken from concrete being cast. Produce test cylinders in accordance with ASTM C 31/31M at rate of four cylinders minimum for each 50 cubic yards or fraction thereof of each class of concrete placed in any one day.
 2. Handle newly-made cylinders carefully to avoid damaging green concrete. Store these cylinders in a box at temperature not lower than 60 degrees F during first 24 hours. Construct a suitable box and provide heat if necessary to maintain cylinders at proper temperatures.
 3. Place cylinders in laboratory storage, with molds removed, under moist curing conditions and temperature of 65 to 75 degrees F, 24 hours after casting. Maintain these moist curing conditions until specimens are tested.
 4. Compressive Strength Tests: Test in accordance with ASTM C 39/39M, one specimen tested at seven days, two specimens tested at 28 days, and one specimen retained in reserve at laboratory for later testing as directed by Design Professional. Include sketch showing nature of fracture of each cylinder. Compliance with 28 day compressive strength requirements specified shall be evaluated in accordance with ACI 318.
 5. Each 28 day compression test report shall clearly indicate, as of report date and for class of concrete being reported, the following:
 - a. Average of latest three test results.
 - b. Lowest average of three consecutive test results recorded to date.
 - c. Average of all sets of three consecutive test results.
 - d. Percentage of tests falling below specified strength.
 - e. Lowest single test result.
- E. Verify subgrade, formwork and concrete temperatures for each concrete placement, when winter-concreting procedures are required, as follows:
1. Prior to concrete placement, verify that contact surfaces of subgrade and formwork are maintained at 35 degrees F.
 2. Ambient and concrete temperatures shall be recorded at placement and every six hours thereafter for first 24 hours. Thereafter, record concrete temperatures twice per 24 hour period for the following three days.

3. Temperatures shall be taken at multiple locations, including internal, surface, corners and edges. Use expendable thermistors or thermocouples cast in the concrete in addition to surface thermometers as appropriate.
- F. Levelness and Flatness of Flatwork: Survey levelness (F_L) and flatness (F_F) of test slabs and floor slabs in accordance with ASTM E 1155. Testing shall be performed at times indicated in Polished Concrete Finishing: Division 03.

END

Section 014537

Inspection And Testing Of Asphaltic Concrete

Part 1 General

1.1 Summary (Non-inclusive)

- A. Section Includes: Inspection and Testing Agency shall perform inspection and testing of asphaltic concrete paving to ascertain conformance with Contract Documents.

1.2 Related Work Specified Elsewhere (Non-inclusive)

- A. Applicable Sections: Division 01.
- B. Inspection and Testing Services: Division 01, refer to for contractual requirements to retain Agency.
- C. Inspection and Testing of Earthwork: Division 01.
- D. Asphaltic Paving: Division 32.

1.3 Submittals

- A. Submit per the requirements of Division 01.
- B. Samples: As indicated.
- C. Quality Control Procedures: Test reports as detailed in Inspection and Testing Services: Division 01, including the following:
 - 1. Field density test results with moisture content and relative density of each Sample. Include, with field density test results, a plan indicating location of each test.
 - 2. Notify Design Professional by telephone within one hour of discovery that materials used, or degree of soil compaction do not conform to indicated requirements. Follow up telephone notification with written report.
 - 3. Test Reports for In-Place Pavement: Contractor shall submit results of tests performed on in-place pavement within thirty (30) days of day's production. Tests shall include those of mix design and attained density.

- D. Certifications: Within two weeks after completion of Work to be tested, submit certification, signed and sealed by a Professional Engineer trained and specializing in field of civil engineering and licensed in State of North Carolina, that asphaltic concrete and related work has been performed in conformance with Contract Documents.

1.4 Quality Assurance

- A. All Inspection and Testing shall be under supervision of Professional Engineer.
- B. Referenced Codes and Standards: Comply with the following in accordance with Division 01.
 - 1. ASTM International (ASTM)
 - D 6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil- Aggregate by Nuclear Methods (Shallow Depth)

Part 2 Products

Not used.

Part 3 Execution

3.1 Inspection

- A. Inspect prepared subgrades under pavements for conformance to specified requirements.
- B. Surface Tolerance: Surface shall be finished with final elevation and slope indicated. No point shall be more than 3/4 inch in deviation from elevation indicated. Local irregularities shall not be more than 1/4 inch in any 10 foot length. For irregularities that develop before completion of rolling, correct by loosening surface mixture and removing or adding material as required. If irregularities or defects that cannot be corrected remain after final compaction, affected area will be considered defective work and shall be designated for repair.

3.2 Testing

- A. Samples: Test Samples of subbase and base courses shall be submitted by Contractor to determine quality of materials and their conformance to Specification. Submit Samples in time to avoid delaying construction.
- B. Density: Density may be measured by nuclear gauge in accordance with ASTM D 6938, or testing of cores cut in pavement, as determined by Inspection and Testing Agency. If test cores are requested, take one 6 inch diameter core per 9,000 square feet or less of day's production, but no less than four cores. Do not compress or distort Samples during cutting, handling, transporting, or storing. Identify Samples and deliver to Inspection and Testing Agency for testing.

1. Compute and report field density of in-place pavement as a percentage of maximum theoretical or Marshall plant mix density obtained during corresponding day's production. At least 96 percent is required for acceptance. If field density does not meet this requirement, instruct Contractor to apply additional compaction, when permitted, to attain required density. If satisfactory density cannot be attained, affected area will be considered defective work, and shall be designated for repair.

- C. Test for Depth: After final compaction of base course, drill one 6 inch diameter test hole per 9,000 square feet or less of day's production. Measure thickness of base course. If thickness is 1/2 inch more or less than specified, area will be considered defective work, and shall be designated for repair. Drill additional test holes to determine extent of defective areas.

END

Part 1 General**1.1 Summary (Non-inclusive)**

- A. Section Includes: Inspection and Testing Agency shall perform inspection and testing of masonry concrete masonry units components to verify conformance with Contract Documents. Services shall include:
1. Inspection of installation of masonry reinforcing and grouting.
 2. Testing of face brick for efflorescence.
 3. Testing of mortar.

1.2 Related Work Specified Elsewhere (Non-inclusive)

- A. Applicable Sections: Division 01.
- B. Inspection and Testing Services: Division 01, refer to for contractual requirements to retain Agency.
- C. Unit Masonry: Division 04.

1.3 Submittals

- A. Submit per the requirements of Division 01.
- B. Quality Control Procedures:
1. Reports: Two copies of each test report and daily inspection reports as detailed in Inspection and Testing Services: Division 01.
 2. Daily Reports: As indicated.
- C. Certifications: Within two weeks after completion of Work to be tested, submit certification, signed and sealed by a Professional Engineer trained and specializing in field of structural engineering and licensed in North Carolina, that masonry and related work has been performed in conformance with Contract Documents.

1.4 Quality Assurance

- A. Inspection and testing work shall be by an engineer, trained and specializing in field of structural engineering.
- B. Inspector: Minimum of ten years inspecting masonry and worked on a minimum of five projects of scope and size of this Project in last three years.
- C. Work of inspecting engineer shall be under direct supervision of Professional Engineer.
- D. Referenced Codes and Standards: Comply with the following in accordance with Division 01.
 - 1. ASTM International (ASTM)
 - C 67 Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile
 - C 140 Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
 - C 476 Standard Specification for Grout for Masonry
 - C 780 Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
 - C 1019 Standard Test Method for Sampling and Testing Grout
 - C 1314 Standard Test Method for Compressive Strength of Masonry Prisms
 - 2. American Concrete Institute (ACI)/American Society of Civil Engineers (ASCE)
 - ACI 530/530.1 Building Code Requirements and Specification for Masonry Structures and Related Commentaries

1.5 Test Procedures

- A. Testing of Face Brick: Perform the following tests in accordance with ASTM C 67.
 - 1. Efflorescence.
- B. Testing of Concrete Masonry Units: Perform the following preconstruction tests in accordance with ASTM C 140.
 - 1. Compressive Strength.
 - 2. Weight.
 - 3. Dimensions.
- C. Mortar Tests: Perform the following preconstruction and construction tests in accordance with ASTM C 780 for each type of mortar mix specified.
 - 1. 28 Day Compressive Strength.
 - 2. Water Retention.

- D. Mortar Test: Perform the following test on face brick mortar for efflorescence.
 - 1. Use a test specimen consisting of two face bricks (previously tested successfully for efflorescence) with a layer of proposed mortar between.
 - 2. Allow specimen to stand for seven days, and test for efflorescence in accordance with ASTM C 67.
- E. Grout Test: Perform the following preconstruction and construction tests on each different type of grout mix in accordance with ASTM C 1019.
 - 1. Slump Test.
 - 2. 28 Day Compressive Strength.
- F. Prism Test: Perform 28 day compressive strength preconstruction test on concrete masonry walls in accordance with ASTM C 1314.

Part 2 Products

Not used.

Part 3 Execution

3.1 Inspection

- A. Report deficiencies immediately to Owner's Representative, Construction Manager and Design Professional.
- B. Daily Reports: Prepare a detailed report for each day Inspector is on Project Site, describing Work accomplished, number of workers, general progress of Work, any deficiencies which had to be corrected or still require correction and any deficiencies which have been corrected and are approved by Inspector.
- C. Construction Inspection
 - 1. Inspect placement of reinforcement, including condition, grade, size, location, spacing and lap splices.
 - 2. Inspect laying, mortaring and grouting of masonry units and elements.
- D. Level 1 Special Inspection:
 - 1. Periodically verify proportions of site-prepared mortar; construction of mortar joints; location of reinforcement, connectors, prestressing tendons, and anchorages; prestressing technique; and grade and size of prestressing tendons and anchorages.

2. Periodically verify size and location of structural elements; type, size and location of anchors and anchorage; size, grade and type of reinforcement, protection of masonry during cold or hot weather; and application and measurement of prestressing force. Continuously verify welding of reinforcing bars.
3. Periodically verify grout space is clean; placement of reinforcement and connectors and prestressing tendons and anchorages; proportions of site-prepared grout and prestressing grout for bonded tendons; and construction of mortar joints.
4. Continuously verify grout placement is in compliance with code and construction document provisions; and grouting of prestressing bonded tendons.
5. Continuously observe preparation of any required grout specimens, mortar specimens and/or prisms.
6. Periodically verify compliance with required inspection provisions of the construction documents and the approved submittals.

3.2 Preconstruction Testing

- A. Test Samples of face brick, concrete masonry units, mortars and grouts selected for Project prior to start of Construction.
- B. Daily Reports: Prepare a detailed report for each day Inspector is on Project Site, describing Work accomplished, number of workers, general progress of Work, any deficiencies which had to be corrected or still require correction and any deficiencies which have been corrected and are approved by Inspector.

3.3 Construction Testing

- A. Review and approve design mix(es).
- B. Test Samples of each different type of masonry mortar and grout for compressive strength at a rate of one test per 2000 square feet of masonry.
- C. Test face brick mortar Samples in accordance with ASTM C 780 and for efflorescence prior to start of Construction and subsequently as follows:
 1. Test Samples of mortar used in Sample Panels.
 2. Test Samples of mortar periodically during Construction.
 3. Test Samples of mortar whenever changes are made in sources of materials.

4. Daily Reports: Prepare a detailed report for each day Inspector is on Project Site, describing Work accomplished, number of workers, general progress of Work, any deficiencies which had to be corrected or still require correction and any deficiencies which have been corrected and are approved in writing by Inspector.

3.4 Deficiencies

- A. Report deficiencies immediately to Owner's Representative Construction Manager and Design Professional.

END

Section 014571

Inspection And Testing Of Roofing And Waterproofing

Part 1 General

1.1 Summary (Non-inclusive)

- A. Section Includes: Inspection and testing of roofing and waterproofing to verify conformance with Contract Documents.

1.2 Related Work Specified Elsewhere (Non-inclusive)

- A. Applicable Sections: Division 01.
- B. Inspection and Testing Services: Division 01, refer to for contractual requirements to retain Agency.
- C. Sections with Work required to be inspected and tested under this Section include the following:
 - 1. Modified Bituminous Sheet Waterproofing: Division 07.
 - 2. Membrane Roofing (Single Ply): Division 07.
 - 3. Flashing and Sheet Metal: Division 07.
 - 4. Roof Accessories: Division 07.

1.3 Submittals

- A. Submit per the requirements of Division 01.
- B. Quality Control Procedures:
 - 1. Field Inspection Reports: As indicated.
 - 2. Field Test Reports: As detailed in Inspection and Testing Services: Division 01.
 - 3. Daily Reports: As indicated.
- C. Certifications:
 - 1. Certification of Substrates: As indicated.
 - 2. Certification of Compliance: As indicated.

1.4 Quality Assurance

- A. Inspector: Minimum of ten years in roofing and worked on a minimum of five (5) projects of scope and size of this Project in last three (3) years.

- B. Testing Agency: Minimum of ten years experience performing tests similar to those specified.
- C. Test Technician: Trained and qualified to administer specified tests with minimum three years experience.
- D. Approval: Agency, Inspectors and Technicians shall be approved in writing by Design Professional.

Part 2 Products

Not used.

Part 3 Execution

3.1 Inspection

- A. Inspector shall:
 - 1. Study requirements of Contract Documents, submittals and manufacturer's written instructions.
 - 2. Enforce indicated requirements.
 - 3. Attend Preconstruction Meeting required for each type of Work.
 - 4. Inspect and approve in writing substrates prior to start of Work. Submit certification of substrates.
 - 5. Inspect Work for conformance with Contract Documents, submittals and manufacturer's written instructions.
 - 6. Identify potential problem areas and establish method of resolving them.
 - 7. Inspect on Project Site condition of applicable stored materials.
 - a. Continuously throughout roofing and waterproofing Work.
 - 8. Notify Design Professional in matters relating to waterproofing, roofing, insulation and sheet metal work, including changes to proposed materials and claims for compensation for extra Work.
 - 9. Make an inspection immediately prior to Date of Substantial Completion and produce punchlist for Contractor's use.
 - 10. Make Final Inspection when Work is completed.
 - 11. Certification of Compliance: Certify in writing that Inspector has performed functions enumerated above and that Work has been performed in accordance with Contract Documents.
 - 12. Daily Reports: Prepare a detailed report for each day Inspector is on Project Site, describing Work accomplished, quantity of workers, general progress of Work, deficiencies corrected or still requiring correction and deficiencies which have been corrected and are approved in writing by Inspector.

3.2 Testing: Waterproofing And Low-Slope Roofing

- A. Flood Testing: Waterproofing shall be flood tested by Contractor as specified in individual Specification Sections. Inspector shall observe performance of test, and submit a report of his observations and test
- B. Non-Destructive Moisture Testing:
 - 1. Scan the entire roofing and waterproofing area using proven techniques and equipment and experienced operators to locate any wet materials below roof membrane.
 - 2. Contractor's option to use one or more of the following:
 - a. Infrared Testing: ASTM C 1153.
 - b. Electric Capacitance Impedance Testing.
 - c. Nuclear Detection Testing.
 - 3. Where flood testing is required, perform scanning not more than two weeks after flood test.
 - 4. Where flood testing is not required, do not perform scanning until rain of intensity sufficient to penetrate potential leaks has occurred.
- C. Pull-Out Testing of Roof Anchors: Initially test five Samples of each type of screw, nail or other anchor used to fasten blocking, insulation, membrane components or roof accessory. Test actual in-place anchors before being covered by subsequent layers as follows:
 - 1. Nails: One (1) test per each 50 lineal feet of blocking or nailers, or fraction thereof.
 - 2. Screws Securing Insulation or Roofing Membrane: One (1) test per 500 screws.
 - 3. Anchors into Concrete Securing Insulation or Roofing Membrane: One (1) test per 250 anchors.
 - 4. Anchors for Insulation or Roofing Membrane Other Than Screws: One (1) test per 250 anchors.
 - 5. All Other Anchors: One (1) test per 500 anchors.
- D. Retesting: For each failed test, whether it is an original test or a retest, employ original Inspection and Testing Agency to perform two (2) additional tests of same type at new locations selected at random by Design Professional. Contractor shall pay for cost of retesting.

END

Section 014570

**Inspection And Testing Of Exterior
Enclosure**

Part 1 General

1.1 Summary (Non-inclusive)

- A. Section Includes: Inspection and testing of exterior enclosure to verify conformance with Contract Documents.

1.2 Related Work Specified Elsewhere (Non-inclusive)

- A. Applicable Sections: Division 01.
- B. Inspection and Testing Services: Division 01.
- C. Exterior Enclosure, General: Division 07.

1.3 Submittals

- A. Submit per the requirements of Division 01.
- B. Qualifications: AAMA accreditation data.
- C. Quality Control Procedures:
 - 1. Testing Protocols: Submit on testing laboratory letterhead, a detailed list of the testing protocol indicated, including criteria for acceptance prior to testing.
 - 2. Test Reports: Include information required in referenced tests.
 - 3. Inspection Reports: As indicated.
 - 4. Daily Reports: As indicated.
- D. Certifications: Certification of Compliance, as indicated.

1.4 Quality Assurance

- A. Laboratory and On-site Testing Agency's Qualifications: Agency shall be AAMA accredited.
- B. Inspection Agency Qualifications: Agency shall have been in business of inspecting exterior enclosures for a minimum of five (5) years. Individual overseeing work required for this Section shall be a licensed architect or engineer and shall have a minimum of ten (10) years full time equivalent experience with systems similar to those required for this Project.

C. Inspector's Qualifications:

1. Minimum of five (5) years experience in inspecting and testing work and worked on a minimum of five (5) projects of scope and size of this Project in last three (3) years.
2. Not Allowed: Experience involved in Inspection and Testing of structural steel, concrete, soils or similar work is not applicable towards minimum qualifications.

D. Certifications:

1. Preliminary Certification: Prior to indicated Coordination Meeting specified in Exterior Enclosure, General: Division 01, Agency shall submit a certification letter outlining services to be provided by Agency, indicating compliance with this Section. Exterior Enclosure submittals will not be reviewed Design Professional without Preliminary Certification.
2. Final Certification: Immediately prior to Substantial Completion, Agency shall submit a letter certifying that inspection and testing services have been carried out in compliance with this Section and that construction complies with Contract Documents, submittals and manufacturer's written instructions. Substantial Completion will not be processed without Final Certification.

Part 2 Products

Not used.

Part 3 Execution

3.1 Field Testing

A. General:

1. Perform field testing at earliest possible date.
2. Do not cover interior or exterior portions of Work to be field tested until testing is completed and assembly has been approved.

B. AAMA 503, "Voluntary Specification for Field Testing of Storefronts, Curtainwalls and Sloped Glazing Systems".

1. Test shall be performed on indicated field mock-up by applying positive pressure to exterior of system unless Agency and Contractor can document satisfactory methods to seal air paths which would otherwise compromise testing of system, and especially perimeter seals.
2. In addition to initial tests, test one (1) additional Sample Panel matching size of original, selected at random by Agency, at 50 percent and 90 percent completion.
3. Testing and performance values shall be minimums required by referenced test.

4. Air infiltration and water penetration load requirements shall be as listed in Specification Section for each assembly and in Exterior Enclosure, General: Division 07. If value is not given, comply with minimum values contained in referenced test standard.
- C. Perform the following test on approximately 10 percent of total lineal footage of horizontal mullions of installed storefront framing and curtainwall:
1. AAMA 501.2 Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems.
 2. If any portion of indicated area fails test, additional tests equal in size to original will be tested until no portion of area specified fails test. Additional testing will be at Contractor's expense.
- D. Perform destructive and non-destructive testing of installed exterior sealant joints in compliance with ASTM C 1521.
1. Single Line of Sealant: Test at frequency recommended in ASTM C 1521.
 2. Double Line of Sealant: Test inner line of sealant prior to installation of outer line at frequency recommended in ASTM C 1521. Test outer line of sealant at 25 percent of the recommended frequency.
 3. Water Exposure Test: Provide ten (10) water exposure tests on sealant randomly selected as approved by Design Professional.

3.2 Retesting

- A. All retesting shall be at expense of Contractor and shall employ Inspection and Testing Agency who performed original tests.
- B. Laboratory testing shall be repeated until compliance is demonstrated.
- C. Field testing shall be repeated at original location of failed test until compliance is demonstrated.
- D. In addition to retesting of original failed test, one additional test at a new location selected by Design Professional of similar scope as original field test shall be provided.
- E. Continue field retesting and adding new field tests until compliance is achieved on first attempt of additional test.

3.3 Inspection

- A. Inspector shall:
 1. Study requirements of Contract Documents, submittals, manufacturer's written instructions and related materials in order to have an in depth knowledge of Project.
 2. Enforce indicated Contract requirements.

3. Attend Preconstruction Meeting required for each type of Work.
4. Inspect and approve in writing substrates prior to start of Work. Submit certification of substrates.
5. Inspect Work for conformance with Contract Documents, submittals and manufacturer's written instructions.
6. Identify potential problem areas and establish method of resolving them.
7. Inspect on Project Site condition of applicable stored materials.
8. Attend Preinstallation Conferences related to exterior enclosure, not including roofs or waterproofing.
9. Provide continuous inspection of construction of mock-ups and field Sample Panels. Submit daily reports.
10. Inspect each area of vapor retarder and air barrier before they are covered by subsequent construction.
11. Provide inspection of every Section of sill flashing below storefronts and base of curtainwall.
12. Provide continuous inspection of testing procedures indicated in this Section. Include observations in test report.
13. Advise Design Professional in matters relating to exterior enclosures, including changes to approved submittals for field conditions and claims for compensation for extra work.
14. Make an inspection immediately prior to Date of Substantial Completion and produce punchlist for Contractor's use.
15. Make Final Inspection when Work is completed.
16. Certify in writing that Work has been performed in conformance with Contract Documents and that inspector has performed required functions.
17. Daily Reports: Prepare a detailed report for each day Inspector is on Project Site, describing Work accomplished, number of workers, general progress of Work, any deficiencies which had to be corrected or still require correction and deficiencies which have been corrected and are approved in writing by Inspector.

END

Part 1 General**1.1 Summary (Non-inclusive)**

- A. Section Includes: Inspection and Testing Agency shall perform inspection and testing of structural steel to ascertain conformance with Contract Documents.

1.2 Related Work Specified Elsewhere (Non-inclusive)

- A. Applicable Sections: Division 01.
- B. Inspection and Testing Services: Division 01, refer to for contractual requirements to retain Agency.
- C. Structural Steel Framing: Division 05.

1.3 Submittals

- A. Submit per the requirements of Division 01.
- B. Quality Control Procedures:
 - 1. Field Inspection Reports: As indicated.
 - 2. Field Test Reports: As detailed in Inspection and Testing Services: Division 01.
 - 3. Daily Reports: Prepare a detailed report for each day Inspector is on Project Site, describing Work accomplished, number of workers, general progress of Work, any deficiencies which had to be corrected or still require correction and any deficiencies which have been corrected and are approved in writing by Inspector.
- C. Certifications: Within two weeks after completion of Work to be tested, submit certification, signed and sealed by a Professional Engineer trained and specializing in field of structural engineering and licensed in North Carolina, that structural steel and related work has been performed in conformance with Contract Documents.

1.4 Quality Assurance

- A. Inspector: Minimum of ten years in inspection of structural steel systems and worked on a minimum of five projects of scope and size of this Project in last three years.
1. Qualifications for welding inspector shall be according to AWS D1.1
- B. Referenced Codes and Standards: Comply with the following in accordance with Division 01.
1. American Institute of Steel Construction (AISC)
 - Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts
 2. ASTM International (ASTM)
 - A 6/6M Standard Specification for General Requirements for Rolled Steel Bars, Plates, Shapes, and Sheet Piling
 - A 325 Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
 - A 490 Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
 3. American Welding Society (AWS)
 - D1.1 Structural Welding Code, Steel
 - D1.3 Structural Welding Code, Sheet Steel

Part 2 Products

Not used.

Part 3 Execution

3.1 Structural Steel Inspection

- A. Review approved submittals from steel fabricator.
- B. Shop-inspect members for defects, such as cracks, excessive camber, deformation and specified surface preparation, prior to shop painting.
- C. Inspect shop painting for coverage and measure Dry Film Thickness (DFT).
- D. Perform visual inspection of welds; measure 30 percent of welds.
- E. Inspect size and placement of anchor bolts in concrete and masonry.
- F. Verify that erected steel frame is surveyed per Specifications.
- G. Verify that erector inspects alignment of beams, shelf angles, lintels, and any other similar supporting member.

- H. Perform visual inspection of bolted connections. When bolted connections utilize load indicator washers, check a minimum of two bolts per connection with an appropriate feeler gauge. When bolts are tightened by turn-of-the-nut method or when torque control bolts are used, verify that all bolts have been tightened.

3.2 Special Inspection

- A. Periodically verify identification markings and manufacturer's certificate of compliance for bolts, nuts and washers.
- B. Periodically inspect bearing-type high-strength bolted connections. Continuously inspect slip-critical high-strength bolted connections.
- C. Verify identification markings and manufacturer's certified mill test reports for structural steel.
- D. Verify identification markings and manufacturer's certificate of compliance for weld filler materials.
- E. Continuously inspect complete and partial penetration groove welds; multipass fillet welds; single-pass fillet welds greater than 5/16 inch; reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls and shear reinforcement; and shear reinforcement. Periodically inspect single-pass fillet welds less than or equal to 5/16 inch, floor and roof deck welds; weldability of reinforcing steel other than ASTM A 706/706M; and other reinforcing steel.
- F. Periodically inspect steel frames for compliance with approved construction documents, including bracing and stiffening details, member locations, and application of joint details at each connection.

3.3 Structural Steel Testing

- A. Perform tests as required by Structural Welding Code.
- B. Fillet welds for shear connections (15 percent at random) shall be tested by magnetic particle method for final pass only.
- C. Ultrasonically test 100 percent of full penetration and partial penetration welds.
- D. Edges of material greater than 1 1/2 inches in thickness, that is to be welded, shall be ultrasonically tested for evidence of laminations, inclusions or other discontinuities. Extent to which such defects will be permitted and extent of repair permitted shall be in accordance with ASTM A 6/A 6M.
- E. Root layer of multiple pass welds and backside of groove welds made from both sides, after back gouging or chipping, shall be tested by magnetic particle method, or dye penetration method if magnetic particle method is not feasible.
- F. Test 100 percent of continuity plate fillet welds by magnetic particle for final pass.

- G. Perform equipment calibrations and production tests of high-strength bolt connections as required by AISC Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts.
- H. When bolts are tightened by "turn-of-the-nut" method, check by calibrated torque wrench 25 percent of bolts in each shear connection, but not less than two bolts per connection.

END