Fennick McCredie Architecture

Taunton Municipal Airport – New Administration Building

Taunton, MA

City of Taunton

1098-06

Addendum No.08

December 1, 2020

Attention all bidders: All bidders are required to acknowledge receipt of this addendum on the general bid forms contained in the contract documents. All information included in this addendum is hereby included as part of the Contract Documents and is to be included in the bidder's scope of work and contract price at the time of bid. Failure to acknowledge this addendum may result in rejection of your bid.

General Information

See below for changes. Please note that in Addendum #3, Question 5 was answered in error - the parking lot is to be reclaimed as noted. Please also note that the substantial completion date has been revised. The 14 month project duration remains unchanged but shall be **substantially complete by April 15, 2022**, allowing more suitable weather for final site work. The project will begin one month later than previously defined. Please also note that the 01 45 29 Testing spec section is not intended as a complete list, but as a guide. More detailed testing language is noted within individual spec sections. This is the final Addendum.

Changes to the Specifications

00 01 10	Table of Contents; revisions noted
00 11 13	Invitation to Bid; Revise substantial completion date to **April 15, 2022**.
00 21 13	Instructions to Bidders – Article 19 – Liquidated Damages; Revise substantial completion date to **April 15, 2022**.
01 10 00	Summary, Part 1.2 B; Revise substantial completion date to **April 15, 2022**.
01 45 29	Testing Laboratory Service; see revisions attached
01 45 29	Testing Laboratory Service; Attachment added
32 11 00	Aggregate Base Course – Landscape; see revisions attached

Questions and Answers

Q1 Regarding Addendum 5 question and answer #2. Does this response assign the responsibility of touching up the factory finish fiber cement siding to the painting Filed sub-bidder?
A1. Touch-ups were referenced in error. The fiber cement siding is factory finished.

Q2 Regarding Specification change "09 91 00 Painting 1.2 B 7; Revise to read "Aluminum sheet metal at fiber cement panel joints." Does this assign painting of aluminum sheet metal at fiber cement panel to the painting filed sub bidder as it is currently specified to be factory finished?
A2. See Addendum 6 spec changes.

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Q3 Are file sub bidders responsible for the cost of their bonds if required?

A3. Refer to 00 11 13 Parts I and L and 00 21 13 Articles 7 and 17 and 00 41 14 Part D.

Q4 Are file sub-contractors responsible for their own scaffolding, staging and hoisting?

A4. Refer to spec section 01 50 00, Part 1.18 as well as individual trade spec sections.

Q5 Are file sub-contractors responsible for their own coring and fire stopping?

A5. Firestopping shall be performed by the Contractor and coordinated with trades unless stated otherwise within the filed sub contract documents. Refer to spec section 01 73 00 Part 1.8, G, 3 for coring responsibilities as well as individual trade specs.

Q6 Is spec section 33 71 21 the responsibility of the electrical file sub?

A6. Refer to the diagrams on sheets C-1 and E-011 for site scope responsibilities.

Q7 Addendum #3, Question 5 states no reclaiming is included in the project. Plan Sheet C-7 (ADD #1) calls out the parking lot to be reclaimed. On Plan Sheet C-14 parking lot paving typical section calls out 6" reclaim and 3" of new pavement. Plan sheet L-104 details 1 &5, call out 10" of compacted aggregate and 4" of pavement. Which is correct?

A7. The landscape asphalt/bituminous concrete details are for the walking paths and where patching the parking area near the new curbing. Yes, the parking lot is to be reclaimed as noted on the Civil drawings. Addendum #3, Question 5 was answered in error.

Q8 In light of the answers provided in Addendum #6, we feel the phasing needs to be clarified further. Per Spec Section 01 10 00 SUMMARY, Addendum #6, the project must be complete by March 15, 2022. Per C2, C3, C4 and C5 the project is phased. The first phase is the demolition of the existing building, construction of the new building, and a limited amount of grading and paving for the new parking area. Phase 2 consists of regrading and paving of the remaining parking lot area, approximately 33,000 SF. Due to the parking lot being phase 2 of the project, the parking lot will need to be paved at the end of the project, which would result in the parking lot being completed in February/March of 2022. Due to weather constraints, asphalt batching plants are not open during the winter. Additionally, no exterior landscaping or site finishes as part of Phase 1 or Phase 2 can be completed due to the weather constraints and cannot feasibly be completed until April of 2022. In light of this, there is no feasible way to complete the project within the time frame noted in the documents. Please confirm if an extension for the completion of phase 2 can be extended into April 2022 or if the project start date can be changed, therefore adjusting the completion date into April of 2022, to account for the weather constraints.

A8. Refer to the general information and spec changes of this Addendum. Please note that the phasing plan shown on C-3, C-4, and C-5 is the general concept. A more detailed phasing and construction plan is to be submitted by the awarded GC as soon as possible.

End of Addendum No. 08

TABLE OF CONTENTS

VOLUME 1 *(DIVISIONS 00 THROUGH 12)*

**** = Filed Sub-Bid Required***

DIVISION 07 — THERMAL AND MOISTURE PROTECTION

DIVISION 08 — OPENINGS

DIVISION 09 — FINISHES

***** = *Filed Sub-Bid Required***

***** = *Filed Sub-Bid Required***

***** = *Filed Sub-Bid Required***

***** = *Filed Sub-Bid Required***

*** = *Filed Sub-Bid Required***

End - Table of Contents

***** = *Filed Sub-Bid Required***

Section 01 45 29

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section consists of the following:

1. Quality assurance.
2. Laboratory responsibilities.
3. Laboratory reports.
4. Limits on testing laboratory authority.
5. Contractor responsibilities.
6. Contractor submittals.
7. Schedule of inspections and tests.
8. Concrete in situ relative humidity, calcium chloride and acidity/alkalinity testing.

1.2 REFERENCES

A. Comply with applicable requirements of the following standards and those others referenced in this Section, under the provisions of Section 01 42 00 - REFERENCES. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

1. ANSI/ASTM D 3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the. Testing and/or Inspection of Soil and Rock
2. ANSI/ASTM E 329 - Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
3. ASTM F 1869 – Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
4. ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes
5. ASTM F 710 – Standard Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.
6. **NFPA 13 – Standard for the Installation of Sprinkler Systems. [ADD08]**
7. **NFPA 14 – Standard for the Installation of Standpipe and Hose Systems. [ADD08]**
8. ~~5.~~**NFPA 101 – Life Safety Code. [ADD08]**

1.3 QUALITY ASSURANCE

A. Comply with requirements of ANSI/ASTM D 3740 and ANSI/ASTM E 329.

B. Laboratory: Authorized to operate in state in which Project is located.

C. Laboratory staff: Maintain a full time specialist on staff to review services. Provide registered Engineer on staff for all review of services related to structural testing.

D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either the National Bureau of Standards (NBS) Standards or accepted values of natural physical constraints.

1.4 LABORATORY RESPONSIBILITIES

A. Cooperate with Architect and Contractor in performance of services; provide qualified personnel promptly on notice.
   1. Attend preconstruction conferences and progress meetings, as requested.

B. Acquaint Owner, Architect, and Contractor's superintendent with testing procedures and with all special conditions encountered at the site.

C. Perform specified Inspection, sampling, and testing of products and construction methods in accordance with specified standards as specified in individual technical specification sections:
   1. Comply with specified standards, ASTM, ANSI, and other recognized authorities.
   2. Conduct and interpret the tests and state in each report whether the test specimens comply with the requirements, and specifically state any deviations therefrom.
   3. Obtain Contractor's written acknowledgment of each inspection, sampling, and test made. Test samples of mixes submitted by Contractor.
   4. Ascertain compliance of materials and mixes with requirements of Contract Documents.

D. Promptly notify Architect and Contractor of irregularities, deficiencies, or non-conformance of Work or Products which are observed during performance of services.

E. Promptly submit written report of each test and inspection; one copy each to Architect, Owner, Contractor, and one copy to Project Record Documents File.

F. Perform additional inspections and tests required by Architect/Engineer.

1.5 LABORATORY REPORTS

A. After each test, promptly distribute directly from the testing laboratory, copies of laboratory report to:
   1. Owner’s Project Representative.
   2. Architect's office.
   3. Consulting engineer's office.
   4. Contractor's office.
   5. Municipal Inspectional Services Department, if required.

B. Include in report the following information:
   1. Date issued,
   2. Project title and number,
   3. Testing laboratory name, address, and telephone number.

4. Name and signature of laboratory inspector.
5. Date and time of sampling,
6. Record of temperature and weather conditions (as appropriate to test).
7. Identification of product and Specifications Section,
8. Location of sample or test in the Project.
9. Type of inspection or test.
10. Results of tests and compliance with Contract Documents.
11. Interpretation of test results, when requested by Architect.
12. Observations regarding compliance with Contract Documents

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.

B. Laboratory may not approve or accept any portion of Work.

C. Laboratory may not assume any duties for Contractor.

D. Laboratory has no authority to stop the Work.

1.7 CONTRACTOR RESPONSIBILITIES

A. Coordinate and cooperate with laboratory personnel, provide access to Work.
1. Monitor each inspection, sampling, and test.
2. Provide Laboratory or Agency with written acknowledgment of each Inspection, sampling, and test.
3. Within 24 hours notify Architect and Owner in writing of reasons for not acknowledging Laboratory results.

B. Secure and deliver to the Laboratory or designated location, adequate quantities of representational samples of materials proposed to be used and which require testing, along with proposed mix designs.

C. Furnish incidental labor and facilities:
1. To provide access to Work to be tested.
2. To obtain and handle samples at the Project site or at the source of the Product to be tested.
3. To facilitate inspections and tests.
4. For storage and curing of test samples.

D. Furnish verification of materials and equipment compliance with Contract Documents.

E. Notify Architect/Engineer and laboratory 72 hours (3 calendar days) prior to expected time for operations requiring inspection and testing services.

F. Identify materials to be tested or inspected by Testing Laboratory or Agency.

G. After determination of need for testing or inspecting by Owner, notify Laboratory sufficiently in advance, minimum five days, of operations to allow for its assignment of personnel and scheduling of tests.

1. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to Contractors negligence.

H. Make arrangements with laboratory and pay for additional samples and tests required for the following conditions:

1. Initial testing indicates Work does not comply with Contract Documents.
2. Contractor requested testing for additional testing and laboratory services beyond specified requirements.

1.8 CONDUCT OF INSPECTIONS AND TESTS

A. The General Contractor shall notify the Owner, Architect, and Testing Laboratory a minimum of 72 hours (3 calendar days) before the performance of work to permit the proper conduct of Owner-authorized inspections and tests.

B. Representatives of Testing Laboratory will inspect the manufacture, assembly, and placement of materials as required and as authorized by the Owner, and report their findings to the Architect, Owner, and Contractor.

C. Work shall be checked as it progresses, but failure to detect any defective work or materials shall in no way prevent later rejection when such defect is discovered nor shall it obligate the Owner to accept such work.

1.9 SCHEDULE OF TESTING AND LABORATORIES BY OWNER

A. Except as otherwise specified, Owner will appoint, employ, and pay services of **qualified** independent firm(s) to perform inspection and testing and other services specified herein, in individual specification Sections, and as additionally required by the Owner or Architect. **[ADD06]**

B. Requirements for testing, observations, and inspections are described in individual specification sections; the schedule provided below is not intended to completely describe all of the inspection and testing Work required for this Contract, and is only furnished as a guide.

1. Section 02 41 20 – ASBESTOS REMEDIATION: [ADD06]

a. Air testing. *{Reference Art.1.2, ¶H, Art.3.4, ¶C.10 and Art.3.6}*.[ADD08]

b. Smoke testing *{Reference Art.3.4, ¶A.6}*.[ADD08]

~~1.~~**2.** Section 03 30 00 - CAST-IN-PLACE CONCRETE: Concrete test cylinders

3. Section 03 30 53 – Miscellaneous Cast-in-Place Concrete: Concrete mix in accordance with ACI 301: [ADD06]

a. Testing Frequency: One composite sample shall be obtained for each day's pour of each concrete mix exceeding 5 cu. yd. but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

~~2.~~**b. Testing Frequency: One composite sample shall be obtained for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.**

~~3. Section 04 43 13 - GRANITE: grout and mortar testing.~~ **[ADD06]**

4. Section 05 12 00 - STRUCTURAL STEEL FRAMING: Testing of welds of field and shop fabricated components. Testing of bolting.
   a. Bolt torque testing.
   b. Welding visual, magnetic particle, ex-ray and ultrasonic tests as specified.
   c. Coating thickness of primer coats.
5. Section 07 92 00 - JOINT SEALANTS: Chemical analysis; adhesive strength; compatibility with adjacent materials; elasticity.
6. Section 08 43 13 - ALUMINUM-FRAMED STOREFRONTS: In-place testing of specified limits of air infiltration and water resistance according to AAMA 502-08 -Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
7. Section 08 44 13 - GLAZED ALUMINUM CURTAINWALL: In-place testing of specified limits of air infiltration and water resistance according to AAMA 502-08 -Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
8. Section 09 91 00 - PAINTING: Chemical analysis; coating thickness
9. Division 21 - FIRE SUPPRESSION: Pressure and leakage testing.
10. Division 22 - PLUMBING: Perform pressure, leakage and disinfection testing.
11. Division 23 - HEATING, VENTILATING AND AIR CONDITIONING: Performance testing. Balancing and leakage testing ~~for LEED Certification~~. **[ADD08]**
12. **General testing and observations for Divisions 31, 32, 33 - Earthwork, Exterior Improvements, and Utilities sections: [ADD06] [ADD08]**
    a. Continuous observations basis during the installation of the foundation, footings, structural slab, and during backfilling and grading of the site.
    b. Testing bearing surfaces prior to the installation of the backfill and foundations.
    c. Sampling and compaction testing of fill materials as specified ~~herein for~~ in individual Specification Sections, and as specified herein. [ADD06] [ADD08]
13. ~~**Section 32 11 00 – AGGREGATE BASE COURSE – LANDSCAPE: [ADD06]**~~ **[ADD08]**
    ~~**a. Moisture Content and Laboratory Maximum Density Testing, tested in accordance with ASTM D 1557 for each type of material to be used on Project to determine optimum moisture content and laboratory maximum density values.**~~
14. **Section 31 20 00 – Earthwork: [ADD06] [ADD08]**
    a. ~~Testing and anaylysis of fill materials, including reused excavated materials. [~~ADD08]
    b. In~~-~~place compaction testing.~~ [ADD08]

c. Perform on-site observation and testing. *{Reference Art. 2.03, Art. 3.08, Art.3.12 ¶A}* [ADD08]

1) Observation of subgrades for footings and slabs.

2) Observation of proof compaction and deep densification.

3) Performing water content and compaction tests.

15. Section 31 20 01 – Earth Moving: [ADD06]

a. Inspect and test subgrades and each fill or backfill layer *{Reference Art.3.17 ¶C}* [ADD08]

b. In-place compaction testing. *{Reference Art. 3.17,¶D}* [ADD06]

16. Section 32 12 16 - ASPHALT PAVING and Section 32 12 17 – ASPHALT PAVING – LANDSCAPE: [ADD06] [ADD08]

a. Smoothness Tolerance testing for each course and finished surface asphalt.

b. Density testing in conformance with M3.11.09 of the *"STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES CONSTRUCTION"*

17. Section 32 13 14 – CONCRETE PAVING – LANDSCAPE: [ADD06]

a. Composite sample testing, as specified herein for:

1) Slump testing.

2) Air Content testing.

3) Concrete temperature testing.

4) Compression test specimen.

5) Compressive-Strength testing.

b. Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:

1) Testing Frequency: Obtain at least one composite sample for each concrete mixture placed each day.

a) When frequency of testing will provide fewer than five compressive strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2) Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3) Air Content: ASTM C 231/C 231M, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

4) Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.

5) Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.

~~6)~~ Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days

18. Section 32 91 13 – SOIL PREPARATION and Section 32 91 14 – SOIL PREPARATION – LANDSCAPE: [ADD06] [ADD08]

a. Physical testing as followws:

1) Soil Texture: Soil-particle, size-distribution analysis by one of the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":

a) Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.

b) Hydrometer Method: Report percentages of sand, silt, and clay.

2) Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."

3) Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1- Physical and Mineralogical Methods."

4) Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods"; at 85% compaction according to ASTM D 698 (Standard Proctor).

b. Chemical Testing:

1) CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."

2) Clay Mineralogy: Analysis and estimated percentage of expandable clay minerals using CEC by ammonium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."

3) Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present, include recommendations for corrective action.

4) Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.

c. Fertility Testing: Soil-fertility analysis according to standard laboratory protocol of SSSA NAPT NCR-13, including the following:

1) Percentage of organic matter.

2) CEC, calcium percent of CEC, and magnesium percent of CEC.

3) Soil reaction (acidity/alkalinity pH value).

4) Buffered acidity or alkalinity.

5) Nitrogen ppm.

6) Phosphorous ppm.
7) Potassium ppm.
8) Manganese ppm.
9) Manganese-availability ppm.
10) Zinc ppm.
11) Zinc availability ppm.
12) Copper ppm.
13) Sodium ppm and sodium absorption ratio.
14) Soluble-salts ppm.
15) Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
16) Other deleterious materials, including their characteristics and content of each.

d. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."

~~12. Division 31, 32, 33 - Earthwork, Exterior Improvements, Utilities sections: Continuous observations basis during the installation of the foundation, footings, structural slab, and during backfilling and grading of the site. Testing bearing surfaces prior to the installation of the backfill and foundations. Sampling and compaction testing of fill materials.~~ **[ADD06]**

~~a. Chemical testing of fill materials.~~

~~b. Proctor tests for compaction.~~

C. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

1. Testing agency will notify Architect, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Architect[, through Construction Manager,] with copy to Contractor and to authorities having jurisdiction.
3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Testing agency will retest and re-inspect corrected work.

1.10 SCHEDULE OF TESTING AND LABORATORIES BY CONTRACTOR

A. General Contractor shall employ and pay for services of an approved independent testing laboratory to perform inspection and testing specified under this Article **1.10** and as additionally in individual specification sections**; THE SCHEDULE PROVIDED BELOW IS NOT INTENDED TO COMPLETELY DESCRIBE ALL OF**

THE INSPECTION AND TESTING WORK REQUIRED FOR THIS CONTRACT, AND IS ONLY FURNISHED AS A GUIDE. [ADD06]

1. **Submit to Architect/Engineer a minimum of three independent testing laboratories for each type of testing specified by individual specification sections and those required by the referenced applicable codes, regulations and standards. [ADD08]**
2. **Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents. [ADD08]**
3. **Owner reserves the right to retain and pay for its own testing for quality assurance checking purposes. [ADD08]**

B. Section 02 41 20 – ASBESTOS REMEDIATION: [ADD06]

1. **Respirator fit tests.**
2. **Analytical results.**

C. Section 02 41 21 – HAZARDOUS MATERIAL REMEDIATION: [ADD06]

1. **Hazardous material / waste characterization.**
2. **Respirator fit tests.**
3. **Personal sampling.**
4. **Waste classification and characterization testing.**

D. Section 02 41 22 – Waste Management and Disposal: [ADD06]

1. **Characterization testing.**
2. **Scrap steel characterization.**

E. Section 03 30 00 - CAST-IN-PLACE CONCRETE, Section 03 30 01 - CONCRETE FOR SITE WORK, Section 03 30 53 - MISCELLANEOUS CAST-IN-PLACE CONCRETE – LANDSCAPE, Section 03 45 00 - PRECAST ARCHITECTURAL CONCRETE, and Section 32 13 14 - CONCRETE PAVING – LANDSCAPE: [ADD08]

1. **All concrete mix design testing shall be paid for by Contractor**

F. Section 09 91 00 - Painting: Moisture content testing of interior and exterior wood prior to application of field painted coatings.

G. Section 32 11 00 – Aggregate Base Course – Landscape: [ADD08]

1. **Moisture Content and Laboratory Maximum Density Testing, tested in accordance with ASTM D 1557 for each type of material to be used on Project to determine optimum moisture content and laboratory maximum density values.**

H. Section 31 20 00 – EARTHWORK [ADD06] and Section 31 20 01 – Earth Moving: [ADD08]

1. **Lab tests to determine suitability of all fill materials. Testing and anaylysis of fill materials, including reused excavated materials. *{*Section 31 20 01 *Reference Art. 3.12 ¶B}***
2. **Fill grain size and moisture-density (Proctor) testing.**

3. **Environmental Off-site fill environment anc charcterization testing.**
4. **In-place compaction testing. *{Section 31 20 01 Reference Art 3.12,¶C}***
5. **Reuse of Excavated Material: Lab tests to determine suitability of re-used excavated material for fill be paid for by Contractor. *{Reference Section 31 20 00, Art.2.03, ¶A}* [ADD08]**

I. Section 32 92 00 – Turf and Section 32 92 01 – Lawn: Lab tests to determine composition of fertilizers. *{Reference Section 32 92 01, Art. 2.2}* [ADD08].

J. Section 33 10 00 – Water Utilities: [ADD08]

1. **Piping pressure testing, *{Reference Art. 3.11,¶A}.***
2. **Hydrostatic pressure testing, *{Reference Art. 3.11,¶B}*.**

K. Section 33 30 00 – Sanitary Sewer: [ADD08]

1. **Start-up and testing of pump system, *{Reference Art. 3.11¶D}*.**
2. **Vacuum testing of completed precast concrete manholes, *{Reference Art. 3.14}***
3. **Testing of completed system by vacuum or by water exfiltration, *{Reference Art. 3.14}, testing includes:***
   a. **Leakage testing of system, including grease trap, sewer pump chamber,**
   b. **Pressure testing of the force main.**
4. **Alarm testing for all pumps.**

L. Section 33 71 19 - Electrical Underground Ducts and Manholes: [ADD08]

1. **Coordination Drawings, confirmation of layouts, inspection of ducts and utility structures, and grounding testing *{Reference Art. 1.5, Art. 2.5 and Art. 3.8}*.**

M. Section 33 71 21 - Grounding and Bonding for Exterior Systems: [ADD08]

1. **System and component grounding testing *{Reference Art. 3.5}***

~~1. Submit to Architect/Engineer a minimum of three independent testing laboratories for each type of testing specified by individual specification sections and those required by the referenced applicable codes, regulations and standards.~~ **[ADD08]**

~~2~~**1.** ~~Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.~~ **[ADD08]**

~~B. Earthwork: Lab tests to determine suitability of all fill materials shall be paid for by Contractor.~~ **[ADD08]**

~~1. Owner reserves the right to retain and pay for his own testing for checking purposes~~

~~C. Concrete Paving and General Concrete Work: Concrete mix design testing shall be paid for by Contractor. Owner reserves the right to retain and pay for his own testing for checking purposes.~~ **[ADD08]**

~~D.~~**N.** ~~Moisture content testing of interior and exterior wood prior to application of field painted coatings~~. **[ADD08]**

~~E.~~**O.** **Required Testing of** Concrete Slabs and Floors **to Receive Finish Flooring and Concrete Sealers**: Relative Humidity, Moisture Vapor Emission and acidity/alkalinity (pH)Testing:

1. General Contractor shall employ and pay for services of an independent testing laboratory to perform relative humidity, moisture vapor emission, and pH tests on concrete slabs as follows. The test shall be witnessed by the Contractor, flooring subcontractors and Owner's Project Representative.
    a. Relative Humidity, Moisture Vapor Emission and pH Testing on all concrete slabs over-which a finished floor is to be installed. This includes, but is not limited to:
        1) Resilient flooring.
        2) Concrete sealers.
        3) Carpet.
    b. Perform moisture and pH tests on all concrete floors over-which stone flooring is to be applied.
2. Requirements: As specified under Part 3 of this Section **01 45 29**.**[ADD08]**
    a. Submit 1 copy of test data to the installers of all flooring materials or coating materials scheduled to be installed.
    b. Provide additional testing in the event test results indicate higher moisture content than recommended by the flooring material and coating material manufacturers for the installation of their products. Perform such additional testing, at no additional cost to the Owner, after procedures have been performed to reduce moisture content to ratings acceptable to the various flooring and coating manufacturers.

~~F.~~**P.** Local Authority Inspections: The Contractor is also responsible for coordinating and cooperating with local requirements for inspections by local Authorities.

1.11 SCHEDULE OF TESTING AND LABORATORIES BY FILED SUBCONTRACTORS

A. Respective Filed-subcontractors shall employ and pay for services of an approved independent testing laboratory to perform inspection and testing specified under this Article and as additionally in individual specification sections
    1. Submit to Architect a minimum of three independent testing laboratories for each type of testing specified by individual specification sections and those required by the referenced applicable codes, regulations and standards.
    2. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

B. Fire Protection System: At least the following tests shall be performed. Conform to requirements specified in individual Division 21 Specification Sections. The test shall be performed and paid for by the subcontractor and witnessed by the Contractor, Owner's Project Manager and authorities having jurisdiction:
    1. Fire protection system flushed and ~~pressure~~ tested **according to NFPA 13 and NFPA 14**. **[ADD08]**

C. Plumbing: At least the following tests shall be performed. Conform to requirements specified in individual Division 22 Specification Sections. The test shall be performed and paid for by the subcontractor and witnessed by the Contractor, Owner's Project Manager and authorities having jurisdiction:

1. Water supply piping hydrostatic pressure test.
2. Sanitary piping test before fixture installation: Cap pipes and fill to highest point in system.
3. Plumbing fixture operation.
4. Gas pipe testing according to NFPA 54.

D. HVAC Testing: All HVAC work shall be tested by an independent testing and balancing agency, approved by Owner. Conform to requirements specified in individual Division 23 Specification Sections. The tests shall be performed and paid for by the subcontractor and witnessed by the Contractor, Owner's Project Manager and authorities having jurisdiction. Adjustments shall be made by the subcontractors directed by the Owner. At least the following tests shall be performed:

1. Piping hydrostatic tests.
2. Air and water balancing.
3. Refrigerant lines leak test.
4. Thermostat control monitoring and testing.
5. Energy Management System operation.

E. Electrical Power System Testing: At least the following tests shall be performed. Conform to requirements specified in individual Division 26 Specification Sections. The tests shall be performed and paid for by the subcontractor and witnessed by the Contractor, Owner's Project Manager and authorities having jurisdiction:

1. Polarity tests.
2. Operation of all circuits.
3. Testing of emergency system.
4. Security systems.
5. Generation system.
6. Grounding systems.
7. Voice/Video/Data networking testing.

F. Emergency Lighting System Testing: Conform to requirements specified in Section 26 51 00 - INTERIOR LIGHTING, and as follows: [ADD08]

1. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

2. Verify that self-luminous exit signs are installed according to their listing and the requirements in NFPA 101.

3. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

~~F.~~ **G.** Electrical Lighting System Testing: Conform to requirements specified in individual Division 26 Specification Sections. At least the following tests shall be performed and paid for by the Filed subcontractor:

1. Operation of every component of entire system.

~~G.~~**H.** Fire Alarm System Testing: At least the following tests will be performed. Conform to requirements specified in individual Division 26 Specification Sections. The test shall be performed and paid for by the subcontractor and witnessed by the Contractor, and Owner's Project Manager:

1. All smoke and heat detectors.
2. Proper operation as required by authorities having jurisdiction.

~~H.~~**I.** Where no testing requirements are described but the Owner or Architect/Engineer decides that testing is required, testing will be performed under current pertinent standards for testing.

1.12 FOLLOW-UP AND CORRECTIVE ACTION

A. The Contractor and the Owner will note the test record on the Testing Log to acknowledge test procedures and results. If follow-up or corrective action is needed, the Contractor shall submit to the Owner two written copies of proposed follow-up or corrective plans and obtain the Owner's written approval before proceeding.

1. Cost of Testing: If tests indicate that materials or work do not comply with requirements, the Contractor shall pay for all retesting, and shall remove and replace non-complying work at no additional cost to the Owner.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONCRETE IN SITU RELATIVE HUMIDITY, CALCIUM CHLORIDE AND ACIDITY/ALKALINITY TESTING

A. Scope:

1. Provide in situ concrete relative humidity and surface pH testing to all concrete slabs specified to be covered with floor coverings or resinous coatings. Includes concrete placed as part of this Work which occurs below grade, above grade (suspended slabs), and slabs on grade.
   a. Existing building suspended slabs may be excluded from this requirement.

B. Scheduling:

1. Testing shall take place after allowing concrete to dry for a minimum of 90 days. Testing to be scheduled no less than one, nor more than three weeks prior to scheduled flooring installation.
   a. DO NOT conduct testing unless the slab environment is identical to that In which the finished flooring Is to be installed.
2. In the event new flooring is to be installed over existing resilient flooring, remove the portion of the existing flooring and adhesive directly under the

area where testing will be conducted. Patch flooring to match existing construction after completion of testing.

C. Test result submittals:

1. Report all test results in chart form listing test dates, time, depth of test well, in situ temperature, relative humidity, moisture vapor and pH levels.
2. List test locations on chart and show same on marked up Floor Plan Drawings.
3. Submit results In duplicate. Deliver copies directly to Architect, Owner's Project Representative and General Contractor.

D. Testing equipment: shall be equal to the following

1. For relative humidity testing:
   a. Digital Meter and Calibrated Humidity and Temperature probe kit as manufactured by Vaisala Inc. (Boston Office) 10D Gill Street, Woburn, MA, 01801 (telephone 781-933-4500).
      1) Minimum 2 point probe calibration.
2. For calcium chloride testing:
   a. Anhydrous calcium chloride testing in accordance with Rubber Manufacturer's Association (RMA) Test requirements.
   b. Test kits: Vaprecision, inc. 2941 West MacArthur Boulevard, Suite 135. Santa Ana, CA 92704 (telephone 800-449-6194).
3. For pH testing:
   a. pH test paper by Micro Essential Laboratory, Inc., P.O. Box 100824 4224 Avenue “H”, Brooklyn, NY 11210, (telephone 718-338-3618).
   b. Distilled or de ionized water.

E. Testing Procedures Quantification of Relative Humidity

1. The test site should be maintained at the same temperature and humidity conditions as those anticipated during normal occupancy. These temperature and humidity levels should be maintained for 48 hours prior and during test period. If meeting this criteria is not possible, then minimum conditions should be 75 degrees F (plus or minus 10 degrees F), and 50 percent (plus or minus 10 percent) relative humidity. When a building is not under HVAC control, a recording hygrometer or data logger shall be in place recording conditions during the test period. A transcript of this information must be Included with the test report.
2. The number of In situ relative humidity test sites is determined by the square footage of the facility. The minimum number of tests to be placed is equal to 3 in the first 1,000 square feet and 1 per each additional 1,000 square feet.
3. Drill test holes utilizing a roto hammer drill. Hole diameter shall not exceed outside diameter of the insertabie test sleeve by more than 0.04 inch. Drilling operation must be dry. Determine the thickness of the concrete slab from Construction Documents. Depths of test holes shall be as follows:
   a. For elevated slabs (not poured in pans): Drill test holes to a depth equal to 20 percent of the concrete thickness.

b. For slabs on grade and elevated slabs in pans: Drill test holes to a depth equal to 40 percent of the concrete thickness.

4. Vacuum all concrete dust from test hole.
5. Insert a hole liner, or sleeve, to the full depth of test hole, assuring that the liner is capped or plugged at the end protruding from the concrete surface.
6. Permit the test site to acclimate, or equilibrate, for 72 hours prior to taking relative humidity readings.
7. Remove the sleeve plug and place a probe into the sleeve assuring that it reaches the bottom of the test hole.
8. Allow the probe to sit in the test sleeve for 30 minutes before taking readings.
9. Read and record temperature and relative humidity at the test site.

F. Testing Procedures - Quantification of Concrete Moisture Vapor Emission through Calcium Chloride Testing.

1. The test site should be maintained at the same temperature and humidity conditions as those anticipated during normal occupancy. These temperature and humidity levels should be maintained for 48 hours prior and during test period. If meeting this criteria is not possible, then minimum conditions should be 75 degrees F (plus or minus 10 degrees F) and 50 percent relative humidity (plus or minus 10 percent). When a building is not under HVAC control, a recording hygrometer or data logger shall be in place recording conditions during the test period. A transcript of this information must be included with the test report.
2. The number of vapor emission test sites is determined by the square footage of the facility. The minimum number of tests to be placed is equal to 3 In the first 1.000 square feet and I per each additional 1,000 square feet.
3. Tests sites are to be cleaned of all adhesive residue, curing compounds, paints, sealers, floor coverings, and similar materials. 24 hours prior to the placement of test kits.
4. Weigh test dish on site prior to start of test. Scale must report weight to 0.1 grams. Record weight and start time.
5. Expose Calcium Chloride and set dish on concrete surface.
6. Install test containment dome and allow test to proceed for 60 to 72 hours.
7. Retrieve test dish by carefully cutting through containment dome. Close and reseal test dish.
8. Weigh test dish on site recording weight and stop time.
9. Calculate and report results as pounds of emission per 1,000 square feet per 24 hours."

G. Testing Procedures Quantification of Acidity/Alkalinity (pH) Level

1. At or near the relative humidity test site and each vapor emission (calcium chloride) test site, perform pH test.
   a. At each testing site, lay down a loose 2 foot by 2 foot sheet of rubber flooring or non perforated polyethelene sheet backed by plywood. Leave in place for 48 hours.

b. Remove rubber sheet/polyethelene and place several drops of distilled or de ionized water onto the concrete surface to form a puddle approximately 1 inches in diameter.

c. Allow the water to set for approximately 60 seconds.

d. Dip the pH paper into the water and remove immediately, compare color to chart provided by paper supplier to determine pH reading

2. Record and report results.

H. Testing Procedures:

1. Initial testing: Provide 3 tests for the first 1,000 square feet.
2. Add one test for each additional 1,000 square feet.
3. Concrete surface area to be tested shall be completely clean. Remove all adhesives, residue, debris and sealing compounds. Remove all dust by vacuum or other methods. Do not use chemicals of any kind to clean concrete.
4. Perform moisture tests in strict accordance with the kit manufacturer's Instructions. Moisture tests shall remain undisturbed for 60 to 72 hours.
5. Immediately after moisture test has been removed from test area, conduct pH test in area previously covered by plastic dome of moisture test kit.
6. After completion of tests submit 2 copies of test data to the Architect. Submit a copy of the test data to all installers of flooring materials and resinous flooring materials scheduled to be installed.
7. Provide additional testing in the event test results indicate higher moisture content than recommended by the flooring material and coating material manufacturers for the installation of their products. Perform such additional testing, at no additional cost to the Owner, after procedures have been performed to reduce moisture content to ratings acceptable to the various flooring and coating manufacturers.

3.2 ATTACHMENTS

A. Attachment A – Statement of Special Inspections [ADD08]

End of Section

Schedule of Inspection and Testing Agencies

This Statement of Special Inspections / Quality Assurance Plan includes the following building systems:

- ☒ Soils and Foundations
- ☒ Cast-in-Place Concrete
- ☐ Precast Concrete
- ☐ Masonry
- ☒ Structural Steel
- ☐ Cold-Formed Steel Framing
- ☐ Spray Fire Resistant Material
- ☐ Wood Construction
- ☐ Exterior Insulation and Finish System
- ☐ Mechanical & Electrical Systems
- ☐ Architectural Systems
- ☐ Special Cases

Special Inspection Agencies	Firm	Address, Telephone, e-mail
1. **Special Inspection Coordinator**	*TBD*	
2. Inspector	*TBD*	
3. Inspector	*TBD*	
4. Testing Agency	*TBD*	
5. Testing Agency	*TBD*	
6. Other	*TBD*	

Note: The inspectors and testing agencies shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official, prior to commencing work.

Qualifications of Inspectors and Testing Technicians

The qualifications of all personnel performing Special Inspection and testing activities are subject to the approval of the Building Official. The credentials of all Inspectors and testing technicians shall be provided if requested.

Key for Minimum Qualifications of Inspection Agents:

When the Registered Design Professional in Responsible Charge deems it appropriate that the individual performing a stipulated test or inspection have a specific certification or license as indicated below, such designation shall appear below the *Agency Number* on the Schedule.

PE/SE	Structural Engineer – a licensed SE or PE specializing in the design of building structures
PE/GE	Geotechnical Engineer – a licensed PE specializing in soil mechanics and foundations
EIT	Engineer-In-Training – a graduate engineer who has passed the Fundamentals of Engineering examination

American Concrete Institute (ACI) Certification

ACI-CFTT	Concrete Field Testing Technician – Grade 1
ACI-CCI	Concrete Construction Inspector
ACI-LTT	Laboratory Testing Technician – Grade 1&2
ACI-STT	Strength Testing Technician

American Welding Society (AWS) Certification

AWS-CWI	Certified Welding Inspector
AWS/AISC-SSI	Certified Structural Steel Inspector

American Society of Non-Destructive Testing (ASNT) Certification

ASNT	Non-Destructive Testing Technician – Level II or III.

International Code Council (ICC) Certification

ICC-SMSI	Structural Masonry Special Inspector
ICC-SWSI	Structural Steel and Welding Special Inspector
ICC-SFSI	Spray-Applied Fireproofing Special Inspector
ICC-PCSI	Prestressed Concrete Special Inspector
ICC-RCSI	Reinforced Concrete Special Inspector

National Institute for Certification in Engineering Technologies (NICET)

NICET-CT	Concrete Technician – Levels I, II, III & IV
NICET-ST	Soils Technician - Levels I, II, III & IV
NICET-GET	Geotechnical Engineering Technician - Levels I, II, III & IV

Exterior Design Institute (EDI) Certification

EDI-EIFS	EIFS Third Party Inspector

Other

Soils and Foundations

Item	Agency # (Qualif.)	Scope
1. Shallow Foundations	PE/GE	Inspect soils below footings for adequate bearing capacity and consistency with geotechnical report. Inspect removal of unsuitable material and preparation of subgrade prior to placement of controlled fill

Cast-in-Place Concrete

Item	Agency # (Qualif.)	Scope
1. Mix Design	ACI-CCI ICC-RCSI	PERIODIC INSPECTIONS: Review concrete batch tickets and verify compliance with approved mix design. Verify that water added at the site does not exceed that allowed by the mix design.
2. Reinforcement Installation	ACI-CCI ICC-RCSI	PERIODIC INSPECTIONS: Inspect reinforcement and verify placement
3. Concrete Placement	ACI-CCI ICC-RCSI	CONTINUOUS INSPECTIONS: Inspect placement of concrete. Verify that concrete conveyance and depositing avoids segregation or contamination. Verify that concrete is properly consolidated.
4. Sampling and Testing of Concrete	ACI-CFTT ACI-STT	CONTINUOUS INSPECTIONS: Test concrete compressive strength, slump, air-content and temperature as per specifications.
5. Curing and Protection	ACI-CCI ICC-RCSI	PERIODIC INSPECTIONS: Inspect curing, cold weather protection and hot weather protection procedures as per specifications.
6. Formwork	PE/SE or EIT	PERIODIC INSPECTIONS: Inspect formwork for shape, location and dimensions of concrete member to be formed.
7. Cast in Place Anchors	PE/SE or EIT	PERIODIC INSPECTIONS: Inspect anchors cast in concrete.

Structural Steel

Item	Agency # (Qualif.)	Scope
1. Fabricator Certification/ Quality Control Procedures ☐ Fabricator Exempt	AWS/AIS C-SSI ICC-SWSI	SUBMITTALS: Review shop fabrication and quality control procedures. Review current AWS D1.1 welder certificate for all field welders on the project. Review certificate of compliance at completion of fabrication.
2. Material Certification	AWS/AIS C-SSI ICC-SWSI	SUBMITTALS: Review certified mill test reports and identification markings on wide-flange shapes, high-strength bolts, nuts and welding electrodes.
3. Bolting	AWS/AIS C-SSI ICC-SWSI	PERIODIC INSPECTIONS: Inspect installation and tightening of high-strength bolts in both bearing and slip-critical connections. Verify that splines have separated from tension control bolts. Verify proper tightening sequence. Verify connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements.
4. Welding	AWS-CWI ASNT	Visually inspect all welds. Inspect pre-heat, post-heat and surface preparation between passes. Verify size and length of fillet welds. PERIODIC INSPECTIONS: Single-pass fillet welds less than or equal to 5/16” CONTINUOUS INSPECTIONS: Complete and partial penetration groove welds, multi-pass fillet welds, and single-pass fillet welds greater than 5/16”. Provide ultrasonic testing of all complete penetration welds.
5. Structural Details	PE/SE	PERIODIC INSPECTIONS: Inspect steel frame for compliance with structural drawings, including bracing, member configuration and connection details.

Section 32 11 00

AGGREGATE BASE COURSE - LANDSCAPE

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Provide labor, materials, equipment and supervision necessary to furnish and install crushed stone base course. Extent of base course is for areas indicated as shown on the drawings.

1.2 SUMMARY

A. Section includes aggregate base course material and installation.

B. Related Sections:

1. Section 033053 “Miscellaneous Cast-in-Place Concrete.”
2. Section 310000 “Earthwork” for related excavation and fill material.
3. Section 321217 “Asphalt Paving – Landscape”.
4. Section 321314 “Concrete Paving – Landscape”.
5. Section 329119 “Soil Preparation – Landscape.”

1.3 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):

1. D 422 Particle-Size Analysis of Soils.

2. D 1556 Density of Soil in Place by the Sand Cone Method.

3. D 1557 Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb. Rammer and 18-in. Drop.

B. Commonwealth of Massachusetts, Massachusetts Department of Transportation (MassDOT): Standard Specifications for Highways and Bridges (Latest Edition).

1.4 QUALITY ASSURANCE

A. The services of qualified inspection and testing agencies shall be used for this work.

B. General: Contractor shall establish and maintain quality control for operations under this section to assure compliance with contract requirements and maintain records of his quality control for all materials, equipment, and construction operations.

C. ~~Testing: Contractor shall arrange and pay for services of a commercial laboratory for material and compaction testing. Contractor shall coordinate and cooperate with testing lab to insure timely completion of required tests.~~

C. Testing Agency: Owner will engage a qualified testing agency to perform Quality Assurance tests and inspections. The contractor shall be responsible for Quality Control.

D. Laboratory Maximum Density: Tests shall be made in accordance with ASTM D 1557 for each type of material to be used on Project to determine optimum moisture content and laboratory maximum density values.

E. Materials Analysis: Aggregate base material shall be tested per ASTM D 422.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aggregate Base Course shall be aggregate conforming to the requirements of Section 400 of MassDOT.

B. Filter fabric: Provide filter fabric where indicated on Drawings.

PART 3 - INSTALLATION

3.1 SUBGRADE PREPARATION

A. Subgrade shall conform to the requirements of Section 400 of MassDOT.

3.2 INSTALLATION

A. General Requirements: aggregate base shall be constructed to lines and grades indicated on Drawings. When constructed in more than one layer, first layer shall be cleaned of loose and foreign matter by sweeping with power sweepers or power brooms, except that hand Brooms may be used in areas where power cleaning is not practicable. Adequate drainage shall be provided during entire period of construction to prevent water from collecting or standing on the area to receive aggregate base. Line and grade stakes shall be provided as necessary for control. Grade stakes shall be in lines parallel to centerline of area under construction and suitably spaced for string lining.

B. Weather limitations: Base shall not be constructed when atmospheric temperature is less than 35°F. Base shall not be constructed on frozen subgrades or subgrade containing frost. If temperature falls below 35° F, completed areas shall be protected against any detrimental effects of freezing.

C. Compaction: Each layer of aggregate base course shall be compacted. Water content shall be maintained at optimum. Density of compacted mixture shall be at least 95 percent of laboratory maximum density. Rolling shall begin at outside edge of surface and proceed to center, overlapping on successive trips at least one-half width of roller. Alternate trips of roller shall be slightly different lengths. Speed of roller shall be such that displacement of

aggregate does not occur. Areas inaccessible to rollers shall be compacted with a hand tamper.

D. Finishing: Surface of top layer shall be finished to grade and cross section shown. Finished surface shall be of uniform texture. Light blading during compaction may be necessary for finished surface to conform to lines, grades, and cross sections. If surface for any reason become rough, corrugated, uneven in texture, or traffic marked prior to completion, such unsatisfactory portion shall be scarified, reworked, recompacted, or replaced as directed.

3.3 FIELD TESTING AND PROTECTION

A. In-Place Density: Field in-place density shall be determined in accordance with ASTM D 1556. Areas not meeting specified compaction requirements shall be reworked as recommended by testing lab and retested until specified compaction is obtained.

Tests shall be performed as follows: Aggregate Base - Two (2) tests per lift.

B. Samples: Samples of all materials imported to site for use on Project shall be submitted to or taken by testing lab for testing as specified herein. Copies of all test reports shall be approved by Architect prior to importing any materials to site.

C. Defects: Settlement is considered to be among defects to be corrected. Contractor shall repair all defects and replace any permanent construction items disturbed by corrective measures at no additional cost to Owner.

D. Smoothness: Surface of each layer shall show no deviations in excess of 3/8 inch when tested with 10-foot straightedge. Deviations exceeding this amount shall be corrected by removing material and replacing with new material, or by reworking existing material and compacting, as directed.

E. Thickness: Compacted thickness of the aggregate base course shall be within l/2 inch of the thickness indicated. Where measured thickness is more than l/2 inch deficient, such areas shall be corrected by scarifying, adding new material of proper gradation, reblading, and recompacting as directed. Where thickness measures more than l/2 inch thicker than indicated, course shall be considered as conforming to specified thickness requirements. Average job thickness shall be average of all thickness measurements taken for the job, but shall be within l/4 inch of thickness indicated.

F. Traffic: Completed portions of base course area may be opened to traffic provided there is no marring or distorting of the surface. Heavy equipment shall not be permitted except when necessary to construction, and then area shall be protected against marring or damage to completed work.

G. Protection: Aggregate base course shall be maintained in satisfactory condition until accepted. Maintenance shall include immediate repairs to any defects and shall be repeated as often as necessary to keep area intact.

END OF SECTION 32 11 00