

SECTION 01 45 23 - TESTING AND INSPECTING SERVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Administrative and procedural requirements for quality assurance services.
 - 1. Quality assurance services include inspections and tests and related actions including reports, performed by independent agencies, and governing authorities. They do not include Contract enforcement activities performed by the Trustees or Architect.
 - 2. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.

1.3 RELATED SECTIONS

- A. Section 01 45 00 - Quality Control: General requirements for inspections and tests.
- B. Individual Product Specifications Sections: Specific requirements for inspections and tests.

1.4 RESPONSIBILITIES

- A. Testing Agency: For the purpose of this specification "Testing Agency" shall include any persons designated by the University to ensure the work is conforms to the contract documents. This definition shall include the Inspector of Record and Special Inspector. Trustees will engage and pay for the services of an independent agency to perform inspections and tests specified as the Trustees' responsibility for both on-site and off-site testing and inspecting. Refer to paragraph E for travel restrictions.
 - 1. Where the Trustees have engaged a testing agency or other entity for testing and inspection of a part of the Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Trustees, unless otherwise agreed in writing with the Trustees.
- B. Retesting: The Contractor is responsible for the cost of retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.
 - 1. Cost of retesting construction revised or replaced by the Contractor is the Contractor's

responsibility, where required tests were performed on original construction.

- C. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested.
- D. Coordination: The Contractor, Project Manager/Inspector, and each agency engaged to perform inspections, testing and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
 - 1. The Contractor is responsible for communicating to the Project Manager/Inspector the scheduling times for inspections, tests, taking samples and similar activities. The contractor shall formally request all inspections.
- E. Payment for Testing Agency Services:
 - 1. Unless otherwise specified, Trustees will pay for tests and inspections performed by Testing Agency, as specified in individual product Sections of the Specifications. Overtime costs due to scheduling for the convenience of the Contractor or to make up for Work behind schedule shall be deducted by Change Order from Contract Sum.
 - 2. When tests and inspections are required on an overtime basis, initial payment will be made by the Trustees. All costs for overtime testing and inspections shall be deducted by Change Order from Contract Sum.
 - a. The deducted cost will be for the full amount and shall not include any mark-up factor.
 - 3. Unless otherwise specified, Contractor shall be back-charged for mileage and travel time for inspection services requiring more than 100 miles from Project site to test products purchased or fabricated by Contractor.
 - a. Testing Agency shall forward all billings and records of such costs to University's Representative for approval.
 - b. Such costs, if determined by University's Representative to be attributable to the Contractor under this provision, shall be deducted by Change Order from Contract Sum.
 - 4. Contractor shall pay all costs for repeated observations, re-inspection or retesting by Testing Agency due to non-conforming Work. Costs shall be deducted by Change Order from Contract Sum.
 - a. The deducted cost will be for the full amount and shall not include any mark-up factor.
 - 5. Additional Tests, Inspections and Related Services: Contractor shall be charged costs for additional tests, inspections and related services, due to the following. Such costs shall be deducted by Change Order from Contract Sum.
 - a. Work is not ready to inspect when inspectors arrive.
 - b. Failure to properly schedule or notify testing and inspection agency or authorities having jurisdiction.
 - c. Changes in sources, lots or suppliers of products after original tests or inspections.
 - d. Changes in means methods, techniques, sequences and procedures of construction that

- necessitate additional testing, inspection and related services.
- e. Changes in mix designs for concrete and mortar after review and acceptance of submitted mix design.
 - f. Multiple off-site fabrication sites.
 - g. Fabrication and installation errors.
 - h. Inefficient, sporadic, or poorly organized manufacturing that causes additional testing costs to be incurred.
- F. Segregation in Billing of Overtime Services: Billings for overtime services shall have straight time and overtime costs segregated and shall have substantiation by detailed explanations justifying necessity of services on overtime basis.
- G. Obligation to Perform Work According to Contract Documents: Employment of Testing Agency shall in no way relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents and applicable Codes.
- H. Limits on Testing Agency's Authority:
- 1. Testing Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Testing Agency may not approve or accept any portion of the Work. Inspection includes only a confirmation that the installation meets the details in the plans and specifications.
 - 3. Testing Agency may not assume any duties of Contractor and will not assist or direct work in any way nor will testing agency coordinate work of other contractors.
 - 4. Testing Agency shall have the authority to stop work when it in direct conflict with contract documents, code or when work poses a risk to the safety of personnel.
- I. Contractor shall make the Work in all stages of progress available for University personal and continuous observation by the Testing Agency.
- 1. Testing Agency shall have free access to any and all parts of the Work at all times.
 - 2. Contractor shall provide the Testing Agency with reasonable facilities for Testing Agency to obtain such information as Testing Agency determines is necessary for Testing Agency to be kept fully informed of the progress and manner of performance of the Work and character of products, according to Testing Agency's duties and responsibilities.
 - 3. Observation and inspection of the Work by Testing Agency shall not relieve Contractor from any obligation to fulfill the requirements of the Contract.
- J. Retesting: When materials tested fail to meet requirements herein specified, they shall be promptly corrected or removed and replaced at the expense of the Contractor and retested in a manner required by University's Representative. Costs involved in retesting shall be deducted by Change Order from Contract Sum.

1.5 TESTS AND INSPECTIONS

- A. Tests and Inspections, General: All construction work shall be subject to inspection by the Trustees and the Architect and all such construction or work shall remain accessible and exposed for inspection purposes until approved by the Trustees.
1. The Trustees will provide project personnel, including inspectors, to be available at the project site.
 2. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of the building code or of other ordinances of the jurisdiction, including plans and specifications. Inspections presuming to give authority to violate or cancel the provisions of code, or of plans and specifications shall not be valid.
 3. It shall be the duty of the contractor to cause the work to remain accessible and exposed for inspection purposes. Neither the Inspector nor the Trustees or Architect shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.
- B. Inspection Requests: It shall be the duty of the Contractor doing the work to notify the Inspector that such work is ready for inspection. The Trustees require that such work is ready for inspection. The Trustees require that every request for inspection be filed at least two business days before such inspection is desired. Such requests shall be in writing.
- C. Approval Required: Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the Inspector. The Inspector, upon notification, shall make the requested inspections and shall either indicate in writing that portion of the construction is satisfactory as completed, or shall notify the Contractor that same fails to comply with plans and specifications. Any portions of Work that do not comply shall be corrected by the Contractor, and such portion shall not be covered or concealed until authorized by the Inspector.
1. There shall be a final inspection and approval of all buildings and structures when completed and ready for occupancy and use.
- D. Inspection Coordination: Contractor shall provide, on a weekly basis, an anticipated Inspection Requirements Schedule, coordinated with the three-week look ahead schedule, showing the anticipated inspection needs for the following three weeks to facilitate appropriate campus coordination and interface as well as mobilization of required inspection staffing.
- E. Required Inspections: Reinforcing steel, structural framework, or interior wall and/or ceiling support framing of any part of any building or structure shall not be covered or concealed without first obtaining the approval of the Inspector.
1. Listed below are the minimum inspection requirements:

Sect #	Section Name	Test	Inspection	Paid By
01 45 0 0	Quality Control		• Final Inspection	University

Sect #	Section Name	Test	Inspection	Paid By
03 30 0 0	Cast-In-Place Concrete	<ul style="list-style-type: none"> • Molded Cylinder Test • Concrete Consistency 	<ul style="list-style-type: none"> • Welding Continuous Inspection • Structural Concrete • Special Inspection • Epoxy Anchor Concrete • Embeds 	University
05 12 0 0	Structural Steel Framing	<ul style="list-style-type: none"> • Bolt Connection Test • Welding • Lamellar Tearing • Prior Testing of Base Material 	<ul style="list-style-type: none"> • Bolt torque • Welding 	University
05 30 0 0	Metal Decking	<ul style="list-style-type: none"> • Mill Analysis & Test Reports 	<ul style="list-style-type: none"> • Welding • Crimping • Closures 	University
05 41 0 0	Structural Metal Stud Framing		<ul style="list-style-type: none"> • Field Welds • Material & Equipment • Screws and spans 	University
07 11 1 3	Bituminous Dampproofing	<ul style="list-style-type: none"> • Site Flood Test 	<ul style="list-style-type: none"> • Periodic Inspection 	University
07 53 2 3	EPDM Roofing	<ul style="list-style-type: none"> • Defect Testing 	<ul style="list-style-type: none"> • Periodic Inspection • Manufactures Rep 	University
07 84 0 0	Firestopping		<ul style="list-style-type: none"> • General Inspection 	University
07 95 1 3	Expansion Joint Cover Assemblies	<ul style="list-style-type: none"> • Exterior Joint Covers • Water Test 	<ul style="list-style-type: none"> • Manufacturer's Field Inspection • Mill Certification 	University
08 51 1 3	Aluminum Windows	<ul style="list-style-type: none"> • Air Infiltration • Water Infiltration 	<ul style="list-style-type: none"> • Fenestration • Solar Gain 	University
09 29 0 0	Gypsum Board		<ul style="list-style-type: none"> • Rough Gypsum Board Inspection • Screws 	University
14 21 0 0	Electric Traction Elevators		<ul style="list-style-type: none"> • Inspections & Permits 	Contractor
14 24 0 0	Hydraulic Elevators		<ul style="list-style-type: none"> • Inspections & Permits 	Contractor

Sect #	Section Name	Test	Inspection	Paid By
22 05 00	Common Work Results for Plumbing		<ul style="list-style-type: none"> • Rough Plumbing Inspection • General Pipe Testing • Pressure testing on supply • DWV stack test • Gas line pressure testing • 	University Contractor
23 05 00	Common Work Results for HVAC		<ul style="list-style-type: none"> • Rough Mechanical Inspection 	University
23 08 00	Commissioning of HVAC	<ul style="list-style-type: none"> • Commissioning 		Contractor & University
26 05 00	Common Work Results for Electrical	<ul style="list-style-type: none"> • Electrical Testing 	<ul style="list-style-type: none"> • Rough Electrical Inspection • 	University Contractor
26 08 00	Commissioning of Electrical Systems	<ul style="list-style-type: none"> • Commissioning 		Contractor & University
27 05 00	Common Work Results for Communications		<ul style="list-style-type: none"> • Rough Telecom Inspection 	University
27 30 00	Voice Communications			Contractor
31 23 00	Excavation and Fill	<ul style="list-style-type: none"> • Soils Density Tests • Field Density Tests 		University
31 23 13	Subgrade Preparation	<ul style="list-style-type: none"> • Backfilling & Compaction 		University
32 11 23	Aggregate Base Courses	<ul style="list-style-type: none"> • Compaction 		University
32 12 16	Asphalt Paving	<ul style="list-style-type: none"> • Compaction 	<ul style="list-style-type: none"> • Slope and flow 	University
32 13 13	Concrete Paving	<ul style="list-style-type: none"> • Slump Test/ Compression Test 	<ul style="list-style-type: none"> • Slope and flow 	University
32 16 13	Concrete Curbs and Gutters	<ul style="list-style-type: none"> • Slump Test/ Compression Test 	<ul style="list-style-type: none"> • Slope and flow 	University

Sect #	Section Name	Test	Inspection	Paid By
32 84 0 0	Planting Irrigation	<ul style="list-style-type: none"> • Hydrostatic Test • Operational Testing 		University
32 93 0 0	Planting		<ul style="list-style-type: none"> • Preliminary Inspection • Field Inspection 	University
33 11 0 0	Water Utility Distribution Piping	<ul style="list-style-type: none"> • Hydrostatic Tests • Pressure Tests • Leakage Tests 		University
33 41 0 0	Storm Utility Drainage Piping	<ul style="list-style-type: none"> • Hydrostatic Test on Watertight Joints 		University

(ARCHITECT TO REVISE/ ADD TO LIST AS REQUIRED BY PROJECT TECHNICAL DETAILS)

- a. Footings
- b. Underground utilities
- c. Rebar
- d. Fire sprinklers.
- e. Ceiling above t-bar
- f. Welding
- g. Roof/metal deck
- h. Roofing
- i. Insulation
- j. Rated wall penetrations
- k. Rated doors and access panels
- l. High voltage cable installation
- m. High pot high voltage cables

2. The Contractor shall be responsible for reviewing all of the Contract Documents for any additional inspection requirements.

1.6 SUBMITTALS

- A. Reports: Trustees' independent testing agency shall submit a certified written report of each inspection, test or similar service, to the Architect, the Trustees, the Contractor, and the Project Manager/ Inspector.
- B. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:

Date of issue
 Project title and number
 Name, address and telephone number of testing agency
 Dates and locations of samples and tests or inspections
 Names of individuals making the inspection or test
 Designation of the Work and test method

Identification of product and Specification Section
Complete inspection or test data
Test results and an interpretation of test results
Ambient conditions at the time of sample-taking and testing
Comments or professional opinion as to whether inspected or tested
Work complies with Contract Document requirements
Name and signature of laboratory inspector
Recommendations on retesting.

1.7 SCHEDULES FOR TESTING

- A. Testing and Inspection Schedule: After discussion with University's Representative and Testing Agency in advance of performance of testing and inspection services, Contractor shall determine dates and times necessary for Testing Agency to schedule performance of required tests and inspections and determine due dates for issuance of reports.
1. Integrate Testing and Inspection Schedule with the Weekly Project Meetings specified in Section 01 31 19 – Project Meetings
 2. Determine and indicate in Testing and Inspection Schedule necessary time for preparation and submission of reports of tests and inspections.
- B. Revising Testing and Inspection Schedule: When changes of the construction schedule are necessary during construction, coordinate all such changes of schedule with the testing Agency as required.
- C. Adherence to Testing and Inspection Schedule: When the Testing Agency is ready to test according to the determined schedule but is prevented from testing or taking specimens due to incompleteness of the work, all extra costs for testing attributed to the delay may be back-charged to the Contractor and shall not be borne by the University.

1.8 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor's Responsibilities for Inspections and Tests:
1. Notify Project Inspector and Testing Agency formally with an Inspection Request form a minimum of two (2) business days in advance of expected time for operations requiring inspection and testing services.
 - a. State Fire Marshal Inspections - Notify Project Inspector a minimum of three (3) business days in advance of expected State Fire Marshal Inspections.
 - b. Architect/Engineer Review – Notify Project Inspector, University Project Manager and Architect/Engineer a min of five (5) business days in advance of all quality assurance reviews.
 2. Deliver to Testing Agency or designated location, adequate samples of materials proposed to be used which require advance testing, together with proposed mix designs or other approved submittal documentation.
 3. Cooperate with University's Representative, Testing Agency, Project Inspector, Architect, Architect's consultants and other responsible design professionals. Provide access to Work areas and off-site fabrication and assembly locations, including during weekends and after normal

work hours.

4. Provide incidental labor and facilities to provide safe access to Work to be inspected and tested, to obtain and handle samples at the Work site or at source of products to be tested, and to store and cure test samples.
5. Provide at least 14 days in advance of first inspection or test of each type, a schedule of tests or inspections indicating types of tests or inspections and their scheduled dates.

1.9 INSPECTIONS AND TESTS BY OTHERS

- A. Inspections by Others: Refer to Section 01 45 00 - Quality Control for requirements regarding observations and inspections by University's Representative, Architect and Project Inspector.
- B. Tests by Others: Refer to Section 01 45 00 - Quality Control and individual product Specifications Sections for requirements regarding tests and inspections by product manufacturers and others, including serving utilities.

PART 2 - PRODUCTS

Not Applicable to this Section.

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. Repair and Protection: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate all deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for "Cutting and Patching."
 1. Protect construction exposed by or for quality control and quality assurance service activities, and protect repaired construction.
 2. Repair and protection of all installed and stored materials is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION

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