



science +
technology
park
at johns hopkins

**Forest City – New East Baltimore Partnership
Science and Technology Park at Johns Hopkins**

**Maryland Public Health Laboratory Project
Baltimore, Maryland**

**Request for Proposal
Material Testing and Inspection Services**

Issued: 20-JAN-2012

Due Date as of Issuance:06-FEB-2012

NOTE: The most up-to-date RFP documents are available from the web site described herein.

1. INTRODUCTION – PROJECT DESCRIPTION

Forest City – New East Baltimore Partnership (FC-NEBP) is seeking a qualified Testing and Inspection Agency to perform Independent Testing and Inspections for the State of Maryland Public Health Laboratory (MPHL) construction project in Baltimore, Maryland.

The project under this RFP, the State of Maryland Public Health Laboratory (MPHL), is a key part of the Science + Technology Park at Johns Hopkins in New East Baltimore. The Maryland Economic Development Corporation (MEDCO), the “Owner” on the Project, has provided bond financing for the Project and shall own the Project improvements. The State of Maryland Department of Health and Mental Hygiene (DHMH) is the entity anticipated to occupy the completed project. As the project developer, FC-NEBP manages the design and construction of the project, and is the agent for the Owner, MEDCO.

The Project is an approximately 230,000 gross square feet (GSF) fit-up laboratory building. The project is a 7 story building, consisting of a lower level, first through fifth floors and a penthouse, with a floor plate of approximately 40,000-50,000 GSF. Space types include building support, offices, conference rooms, library, lab training, BSL-2 and a significant complement of BSL-3 space. The project will be located within the 31 acre East Baltimore development area wherein FC-NEBP is the master developer.

The Science + Technology Park at Johns Hopkins and The New East Baltimore Community is a life science and residential campus located immediately north of the Johns Hopkins Medical Campus. The campus is bounded north – south by E Chase Street and E Madison St and bounded east – west by N Broadway and N. Washington Street.

The first phase of development encompasses about 31 acres and is projected to cost around \$1.0 billion. It consists of approximately 1.1 million square feet of life sciences/office space; 850 residential units; up to 80,000 square feet of retail space, a hotel of at least 180 rooms, two parking garages, three acres of community parks and open space and other amenities. The residential units will offer a range of options from single family row-homes to condominiums, apartments and graduate student housing.

When complete, it will be a vibrant mixed-use 24/7 community. (See “Current Master Site Plan” at the end of this section for details on the development mix and layout for the 31 acres). The life sciences buildings are labeled as “L- #”, the residential buildings/units are labeled as “R- #” and the parking garages are labeled as “P- #”. The parcel labeled “L- 4” is the location of the building that is the subject of this RFP.

MEDCO has independent procurement authority. The procurement process that is the subject of this RFP will be administered by FC-NEBP and MEDCO in accordance with MEDCO procurement procedures.

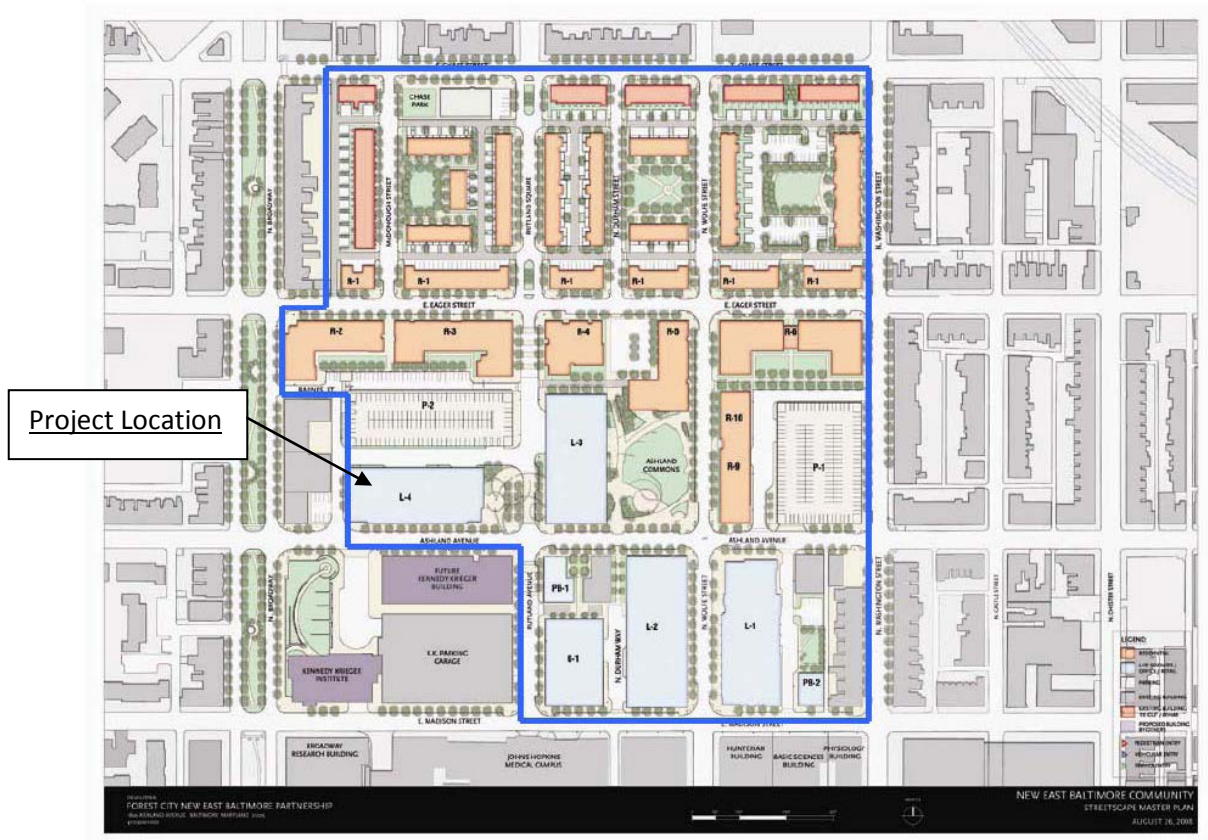
This project and the offeror proposals in response hereto are subject to Maryland Prevailing and Living Wage laws and applicable portions of State Finance and Procurement Article Titles 16, 17, 18, and 19.

The Science + Technology Park at Johns Hopkins is an exciting and highly visible development project with strong support from the local community, Johns Hopkins University, Kennedy Krieger Institute, City of Baltimore, State of Maryland and many other constituents and stakeholders.

The information herein is intended to assist in offerors' proposal preparation and to help ensure such proposals are responsive to the submission requirements.

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After conclusion of negotiations with the selected awardee, the Owner, at its option, may make Owner-selected portions of awardees proposal an exhibit to a contract that will obligate the Agency to perform as promised in its proposal.



1. SCOPE OF WORK

1.1 Exclusions from Scope of Work:

- 1.1.1 Schnabel Engineering was employed by the Project to provide the geotechnical services and report that formed the basis of the structural and other design elements of the Project. Consequently, Schnabel Engineering will be employed by the Project to also perform the work that flows from its role as the author of the Project geotechnical report. In particular, this shall include examination of sub-grades exposed in readiness for placement of footings and road beds, and recommendations for action. Such scope shall be excluded from this contract.
- 1.1.2 Other than work directly related to testing (e.g. transporting cylinders), there shall be no payment under this contract for mileage, travel, lodging and expenses of a similar nature, unless expressly approved in advance by Owner, for activities in the Baltimore-Washington area.

1.2 Included in Scope of Work:

- 1.2.1 The Testing and Inspection Agency, hereinafter referred to as the Agency, shall furnish all supervision, labor, transportation, materials, supplies, consumables and equipment necessary to perform the Scope of Work as described in this scope of work, Project Specification Section 01 45 00 and related Project Specification Sections listed herein in attachment B. Services shall be provided on an as-needed basis for a period of approximately 30 months (First Quarter 2012 through Second Quarter 2014).
- 1.2.2 The Agency shall perform laboratory and field tests and inspections for compliance with Project Contract Documents. Agency's Inspectors / Technicians shall also review and become familiar with relevant Contract Documents and attend Pre-Installation Meetings as requested by the Owner.
- 1.2.3 Agency shall furnish the following types of Field and Lab Testing and Inspection Services and prepare and submit test reports detailing contract compliance. Agency shall include all necessary equipment for field testing or gathering of samples for lab testing.
 - 1.2.3.1 Cast-in-Place Concrete
 - 1.2.3.1.1 Provide the services of a qualified Concrete Inspector / Technician to inspect placement and welding of reinforcement steel, formwork and monitor concrete design mixture, placement, vibration and curing procedures. Coordinate with construction contractor in its preparation and use of pre-pour sign-off form. The Concrete Inspector shall also field test concrete for slump and other specified requirements, and also collect / prepare specimens for concrete laboratory testing. Prior to removal of shores and forms from beams and slabs, Inspector will verify concrete strengths. The Concrete Inspector shall also perform Floor Flatness and Floor Levelness testing.
 - 1.2.3.1.2 Advise Owner's inspector on curing, cold weather protection and hot weather protection.
 - 1.2.3.2 Precast Architectural Concrete
 - 1.2.3.2.1 Provide the services of a qualified Concrete Inspector / Technician to review construction contractor submitted test reports and verify compliance with Product requirements as described in the project specification sections 01 45 00, 03 45 00 and ACI. This shall include plant inspection(s).
 - 1.2.3.3 Unit Masonry Assemblies
 - 1.2.3.3.1 Provide the services of a qualified Masonry Inspector / Technician to perform field tests for grout/mortar and prepare specimens for lab testing such as compressive strength of grout/mortar and masonry prisms.

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- 1.2.3.4 Structural Steel Framing and Miscellaneous Welding
 - 1.2.3.4.1 Provide the services of a qualified Structural Steel Inspector to observe erection of steel framework, inspect anchor bolts, erection tolerances, torque of bolted connections and inspect welded connections. Structural Steel Inspector shall also inspect the weld connections on metal deck installation. Implement a qualification procedure for all persons performing arc welding on site.
- 1.2.3.5 Baseplate Grout
 - 1.2.3.5.1 Provide the services of a qualified Technician to inspect the installation of baseplate grout. Technician shall also prepare samples and provide tests of baseplate grout as described in specification sections 01 45 00.
- 1.2.3.6 Earth Moving
 - 1.2.3.6.1 In coordination with Schnabel Engineering, provide the services of a qualified Technician to (a) perform compaction testing of areas to receive structural fill, backfill, paving, utilities, and/or slab-on-grade, (b) evaluate material below footings for suitable bearing capacity, and (c) test bearing stratum at footing subgrade levels.
- 1.2.3.7 Asphalt Paving
 - 1.2.3.7.1 Provide the services of a qualified Asphalt Inspector / Technician to observe placement of asphalt material, verify thickness, surface smoothness, and in-place density and prepare field samples for lab testing.
- 1.2.3.8 Laboratory Services
 - 1.2.3.8.1 Provide the services of a laboratory to:
 - 1.2.3.8.1.1 undertake soils tests to include Proctor tests, sieve analysis tests, Atterberg limits tests, and moisture content tests. Tests may apply to imported and borrowed fills and materials.
 - 1.2.3.8.1.2 store, cure, cap and test concrete cylinders.
 - 1.2.3.8.1.3 perform masonry materials testing to include compressive strength testing of mortar, grout and prism specimens.
 - 1.2.3.8.1.4 perform masonry unit testing to include compressive strength, moisture content, absorption, unit weight and efflorescence of CMU/brick units.
 - 1.2.3.8.1.5 perform testing of asphalt materials for density and sieve analysis.
 - 1.2.3.8.1.6 perform any other tests required by the referenced specifications and good practice.
 - 1.2.3.8.2 Results of all lab services shall be reviewed and certified by a registered Professional Engineer licensed in the State of Maryland. The PE shall upload PDF copies of formal reports (signed and certified) to Owner's Prolog site within five (5) work days after the time tests are performed. The cost of the PE and related support staff shall be billed at a percentage of the cost of the on-site and related testing/inspection services and activities. This percentage shall be indicated on the bid form and, if approved, shall be set out in the contract.

1.3 L/M/WBE REQUIREMENTS

- 1.3.1 In accordance with the attached Section 01 35 01 specification, the Agency shall involve local, small, women owned and minority owned businesses in completion of the work necessary to satisfy the project's business requirements and goals, which include building capacity for such firms to grow and compete effectively with their mainstream counterparts. In addition, the RFP evaluation panel will look favorably on offeror's proposed approach to enhance workforce development (again, as called out in the attached Section 01 35 01 specification).

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- 1.3.2 The Project goals for this type of contract are 17% MBE + 9% WBE = 26% of total contract value.
- 1.3.3 Offeror's proposal shall present details of Offeror's proposed approach to inclusion and the Contract shall include provisions obligating awardee to fulfill its approved LBE/MBE/WBE plan, which shall satisfy the minimum requirements and reporting obligations required by the attached Section 01 35 01 specification. Offeror shall submit a participation plan satisfying or exceeding the specified requirements; this plan shall outline roles and responsibilities for Offeror's LBE/MBE/WBE business partner(s), consultants, and subcontractors as well as the Offeror's capacity-building strategies.
- 1.3.4 The attached Section 01 35 01 specification contains the inclusion requirements and procedures for the New East Baltimore Project.
- 1.3.5 In its evaluation of proposals, the evaluation team shall give a favorable review to offerors' innovative proposals to employ certified (by City of Baltimore or State of Maryland DoT) firms and/or personnel who reside within the eleven ZIP codes listed in the attached Section 01 35 01 specification.
- 1.3.6 MDOT and MWBOO web sites are provided for convenience of offerors: www.mdot.state.md.us and <http://cityservices.baltimorecity.gov/mwboo/>

2. SUBMISSION REQUIREMENTS

- A.** Please provide response to this Request for Proposal in accordance with the requirements set forth in this section, both for content and sequence.
- B.** Submit an electronic PDF copy of the proposal and related information to:

Peter Roy, peterroy@forestcity.net
Vice President, Engineering and Construction
Forest City – New East Baltimore Partnership (FC-NEBP)
Suite 102, 855 North Wolfe Street
Baltimore, MD 21205
- C.** Proposals are due by 11:00 AM on February 6, 2012.
- D.** Award of contract is anticipated to be made on or before February 14, 2012
- E.** Proposal shall be 8-1/2 x 11 inch format PDF.
- F.** Required Proposal Submittals: Content and Sequence of Proposal -
 - 1.1.1 Cover Letter and Introduction: Stating the name and address of firm, whether the Offeror is an individual, partnership, corporation or joint venture. Letter shall also contain the contact telephone number and name of a person or persons authorized to make representations for the Offeror, and a statement indicating a commitment to the project should the Offeror be awarded the subcontract.
 - 1.1.2 Table of Contents: Material included in the Proposal.
 - 1.1.3 Corporate History: A brief narrative describing the Offeror's corporate history, corporate resources, and the capabilities of the branch office proposed to service this project.
 - 1.1.4 Management Plan: Provide a written management plan designed to address the following factors, and including the following minimum requirements:
 - 1.1.4.1 Work Plan: Narrative work plan identifying the location of the office proposed to service this project, a project specific organization chart, and the Offeror's plan

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for delivering consistently high quality and prompt service to this project. This narrative shall briefly address each area in the Scope of Work. This section shall also include examples of standard report formats for field inspections, field tests and sampling reports, lab test results, etc.

- 1.1.4.2 Staffing Plan / Key Personnel: Provide a staffing chart showing the names and required information for each position. Provide resumes for each of the proposed personnel (Project Engineer / Project Manager, Field Technician, and licensed Professional Engineer, at a minimum). The Offeror shall demonstrate that it has sufficient capacity to timely provide Field Technicians for each area (i.e., concrete, masonry, structural steel, earthwork and asphalt) on an as-needed basis.
 - 1.1.4.2.1 The same technician may be proposed for several areas provided their qualifications are presented. All proposed personnel must meet their minimum mandatory requirements and be qualified to perform the inspections and/or field testing required for a particular area. Certifications may include ACI, AWS, ASNT, ICC, NICET and EDI. The Field Technician resumes shall identify years experience with the present employer as well as overall experience in the Materials Testing and Inspection industry. The Field Technician resumes shall also identify qualifications and any applicable certifications, registrations and education. The resumes for the Project Engineer / Project Manager and the Professional Engineer shall indicate education, certifications and years experience, both with the Testing Agency and with other firms.
- 1.1.5 Schedule of Required Services: A completed Attachment A, Schedule of Required Services, and a copy of the Offeror's current standard publicized or posted best-available fee schedule.

3. REVIEW OF CONSTRUCTION DOCUMENTS:

The drawings, specifications and final geotechnical report are available for viewing by offerors by contacting Karen Brice at 410-900-1006 or KarenBrice@forestcity.net.

4. QUESTIONS:

Please submit all questions, requests for clarification electronically to the following email address: peterroy@forestcity.net

5. EVALUATION CRITERIA

- A.** Offerors shall provide competitive fee proposals. The proposals shall be subjected to a "best value" evaluation under which technical factors shall be given more weight than price. The "evaluation factors" listed below shall be considered by the evaluators, as well as price. We encourage offerors to be particularly responsive to the evaluation criteria.
- B.** Owner will award the contract to the responsible Offeror whose proposal satisfies the requirements of this RFP and represents the best value to the project.
- C.** Minimum requirements for proposed personnel must be met prior to evaluation of the proposed rates. Failure to demonstrate minimum qualifications shall result in disqualification.
- D.** After determination of minimum mandatory requirements, award will be based upon evaluation team's analysis of the required information, work plan, and proposed personnel. The non-price information will be evaluated against the non-price evaluation factors.

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- E.** The non-price evaluation factors are team qualifications (which shall also focus on relevance of experience), plan to satisfy L/M/WBE and workforce requirements, demonstrated local capacity of offeror, and other incidental factors the evaluation team deems appropriate.
- F.** Owner will evaluate price offers by comparing the completed Attachment A – Schedule of Required Services.
- G.** If the offeror with the best non-price proposal also offers the lowest cost proposal, that offeror shall be the apparent awardee. If the best non-price offeror does not offer the lowest cost proposal, the evaluation team will analyze whether the differential in bid price is commensurate with the value of the differential in qualifications, and shall make a selection of awardee based on such business judgment analysis.
- H.** It is Owner's intention to promptly award the resulting contract and issue the notice to proceed to the Agency.

6. OTHER REQUIREMENTS AND INFORMATION

- A.** Owner may require whatever evidence is deemed necessary to Owner relative to the Offeror's financial responsibility.
- B.** Owner reserves the right to request further information from the Offeror, either in writing or orally. Such requests will be addressed to that person authorized to represent the Offeror.
- C.** Owner reserves the right to cancel the project at any time up to the award of contract.
- D.** This RFP does not commit Owner to award any contract or to pay any costs incurred in the submission of a proposal.
- E.** Owner reserves the right to reject any and all proposals and to waive any irregularities in any proposal received.

7. CONTRACT DOCUMENTS

- A.** An industry-standard form of contract shall be utilized in the contract resulting from this RFP.

ATTACHMENT A

SCHEDULE OF REQUIRED SERVICES

The Offeror shall set forth (in clearly legible figures) the cost for identified items in the spaces below. Said prices constitute total compensation in accordance with Paragraph 2.0 – Basis of Payment. Offeror is required to provide a cost for each item. The number of tests shown below is a generalized estimate; actual numbers of tests required may vary and will depend on field conditions encountered at the site. However, a bid of zero is acceptable and indicates that the item will be provided as often as required at no expense to Owner.

I. LABORATORY TESTS / FIELD TESTS

Type of Test	Cost Per Test	Estimated No. of Tests		Total Cost
		Number	Units	
CAST IN PLACE CONCRETE				
Concrete: ASTM C 172		289	Tests	
Slump: ASTM C 143/C 143M		130	Tests	
Air Content norm. wght.: ASTM C 231		130	Cylinders	
Air Content: Lght Wght Concrete, ASTM C 173/C 173M		0		
Concrete Temperature: ASTM C 1064 / C 1064M		130	Tests	
Unit Weight: Lght Wght Concrete, ASTM C 567		0		
Compression Test Specimens: ASTM C 31/C 31M		1600	Cylinders	
Compressive-Strength Tests: ASTM C 39 / C 39M		1600	Cylinders	
Slab Flat & Levelness: ASTM E 1155		42	Tests	

PRECAST ARCHITECTURAL CONCRETE: Review/Interpret GC Test Agency Report				
ASTM C39		0		
ACI 301		0		
ASTM C173 or C231		0		

UNIT MASONRY ASSEMBLIES				
Brick Unit Compression: ASTM C67		6		
CMU Compression: ASTM C140		6		
Grout Slump: ASTM C143		0		
Brick Units: IRA ASTM C67		6		
Masonry Modulus of Rupture				

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UNIT MASONRY ASSEMBLIES				
Freeze-Thaw Durability: ASTM C67				
Mortar Compression: ASTM C270				
Grout Compression: ASTM C1019				
Prism Compression: ASTM C1314				
Field Initial Rate of Absorption (IRA): ASTM C67				
Mortar: ASTM C780				

MASONRY MORTAR				
Mortar: ASTM C780		60		
Mortar Compression Strength: ASTM C270		60		

MASONRY GROUT				
Grout Slump: ASTM C143		75		
Grout Compression Strength: ASTM C1019		75		

STRUCTURAL STEEL FRAMING				
Bolted Connections:				
RCSC's ASTM A 325 or A 490 Bolts				
Welded Connections:				
Visual Inspection per AWS D1.1				
AWS D1.1				
Liquid Penetration: ASTM E 165				
Magnetic Particle: ASTM E 709				
Ultrasonic: ASTM E 164				
Radiographic: ASTM E 94				
Full Penetration Moment Welds: Ultrasonic per AWS D1.1				
Column Splice Welds: Ultrasonic per AWS D1.1				
Remaining Welds: Ultrasonic per ASTM E 164				
Shear Connections: Inspect & test per AWS D1.1				

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COLD-FORMED METAL FRAMING				
ASTM E736		0		

EARTHWORK: Per ASTM 1556, 2167, 2922 & 2937				
Paved and Building Slab Area		3		
Foundation Wall Backfill		10		
Trench Backfill		4		

ASPHALT PAVING: Uncompacted & Compacted Samples Per AASHTO T 168				
Thickness: ASTM D 3549		3		
Smoothness: Per Tolerances		3		
In Place Density:				
ASTM D 1188 or D 2726		3		
ASTM D 2950 w/ D1188 or D2726		3		

II. FIELD TESTS / INSPECTIONS

A. ON-SITE SERVICES:

Type of Time	Rate Per Hour	Estimated No. of Hours	Total Cost
Geotech Inspector - Regular		800	
Concrete Inspector - Regular		3000	
Masonry Inspector - Regular		100	
Structural Steel Inspector - Regular		150	
Asphalt Inspector - Regular		24	

III. ON-CALL SERVICES

A. Registered Professional Engineer:

Type of Time	Rate Per Hour	Estimated No. of Hours	Total Cost
Off-Site		80	
On-Site		80	

B. Project Engineer / Project Manager:

Type of Time	Rate Per Hour	Estimated No. of Hours	Total Cost
Off-Site - Regular		120	
On-Site - Regular		120	

ATTACHMENT B

SPECIFICATIONS SECTIONS:

Attached:

01 35 01 - LBE/MBE/WBE Inclusion and Workforce Development Requirements

01 45 00 – Quality Control

Draft Form of Contract [TBD]

Available for Viewing on the Project Site:

03 30 00 – Cast-in-Place Concrete

03 45 00 – Precast Architectural Concrete

04 20 00 – Unit Masonry Assemblies

05 12 00 – Structural Steel Framing

05 40 00 – Cold-Formed Metal Framing

31 20 00 – Earth Moving

32 12 16 – Asphalt Paving

Section 01 35 01 - LBE/MBE/WBE Inclusion and Workforce Development Requirements

PART 1 - GENERAL

1. Contract Requirements:

- 1.1 The project associated with this specification is within the East Baltimore Development Inc. (EBDI) project area. Therefore, Contractor shall comply with the following inclusion requirements.
- 1.2 All records required to be maintained by Contractor under this specification are subject to ongoing audit by the Owner and EBDI.
- 1.3 Contractor shall obligate its subcontractors and sub-subcontractors to this specification by means of appropriate flow-down clause(s), and shall require said subcontractors and sub-subcontractors to satisfy the requirements of this specification section, including timely providing documentation required by this specification and as required by the Economic Inclusion Team (or duly appointed designees).
- 1.4 The requirements of this Section are an essential part of the Contract, including the requirement that Contractor fulfill its detailed Owner-approved Contractor-authored inclusion plan.

2. Background/History:

- 2.1 In April 2002, the Agreement for Minority Inclusion for the East Baltimore Housing/Biotech Park Development Project established a commitment to dramatically increase contracting and procurement dollars spent with minority businesses in all aspects of the East Baltimore Project, as well as spur greater involvement of minority businesses in identified growth sectors of the City's economy, including, but not limited to retail, technology, and real estate development; and to dramatically increase the number, magnitude and success rate of minority businesses in Baltimore City.
- 2.2 In addition, the Agreement establishes a commitment to utilize collective resources to provide career-oriented employment opportunities for Baltimore residents, with qualified displaced residents being given a preference for job training opportunities over other qualified applicants that are not former residents of the EBDI project area.
- 2.3 To assist in the fulfillment of the above goals, Contractor shall comply with the requirements of this specification in support of EBDI's promotion of:
 - 2.3.1 the involvement of Minority-Owned (MBE), Women-Owned (WBE), and Locally-Owned Businesses (LBE) (collectively referred to herein as Targeted Business Enterprises); and
 - 2.3.2 the training and employment of local residents, in the ongoing economic transformation of the East Baltimore Revitalization Area.
- 2.4 This Economic Opportunity Plan and Procurement Policy (hereinafter referred to as "the Plan") outlines the policies and protocols that have been developed to ensure the achievement of the goals of EBDI's Economic Opportunity Initiative and the aforementioned Agreement for Minority Inclusion.

3. Economic Inclusion Definitions

- 3.1 The following definitions apply to this specification:
 - 3.1.1 **Minority Business Enterprise (MBE)** means a business enterprise that is owned, operated, and controlled by one or more minority group members (African American, Hispanic American, Asian American, or Native American), who have at least 51% ownership, and in which the minority group members have operational and managerial control, interest in capital, and earnings commensurate with their percentage of ownership. To qualify, an MBE enterprise shall be certified by the City of Baltimore and/or by the State of Maryland (e.g. by MDOT) as an MBE.

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- 3.1.2 **Women’s Business Enterprise (WBE)** means a business enterprise that is owned, operated, and controlled by one or more women who have at least 51% ownership, and in which the women have operational and managerial control, interest in capital, and earnings commensurate with their percentage of ownership. To qualify, a WBE enterprise shall be certified by the City of Baltimore as a WBE and/or by the State of Maryland (e.g. by MDOT) as a WBE/Female.
- 3.1.3 **Local Business Enterprise (LBE)** means a business enterprise whose principal office is physically located in Baltimore City, subject to the three-level award priority system described below. Contractor shall employ LBE’s to satisfy the LBE Inclusion goals set out herein. To qualify, an LBE shall also be registered and in good standing with the Maryland Department of Assessment and Taxation as a legal business entity, and shall be subject to Baltimore City taxes. Local MBE and WBE’s may also qualify as LBEs. EBDI reserves the right to evaluate any and all LBEs’ ability to satisfy financial, technical, or other criteria before or after bid opening. Contractor shall invite the Economic Inclusion Team to bid review meetings conducted by Contractor, in order to allow the team to verify the status of candidate LBE firms under consideration by Contractor. Contractor is obligated to maintain records necessary to demonstrate that it has marketed, bid and awarded subcontracted LBE work in accordance with the following geographical priorities:
- 3.1.3.1 **First Priority:** LBE businesses located and having their primary headquarters in the 88 acres of EBDI project area (bounded by Madison Street on the south, Broadway on the west, Patterson Park Ave. on the east and the Amtrak railroad track on the north);
- 3.1.3.2 **Second Priority:** LBE businesses located and having their primary headquarters in the following East Baltimore zip codes: 21202, 21205, 21206, 21213, 21214, 21218, 21224, 21231, 21237, 21251 and 21287;
- 3.1.3.3 **Third Priority:** Businesses located and headquartered elsewhere in Baltimore City.
- 3.1.4 **Local Resident** means a resident living in Baltimore City. Contractor is obligated to maintain records demonstrating that it has utilized local residents as the “first source” of its hiring and has given priority (for research, marketing, notices, advertising and hiring) in the following order:
- 3.1.4.1 **First Priority:** Residents residing in, relocated from or otherwise impacted by the EBDI revitalization project area (bounded by Madison Street on the south, Broadway on the west, Patterson Park Ave. on the east and the Amtrak railroad track on the north);
- 3.1.4.2 **Second Priority:** East Baltimore residents residing in the following zip codes: 21202, 21205, 21206, 21213, 21214, 21218, 21224, 21231, 21237, 21251 and 21287; and
- 3.1.4.3 **Third Priority:** Residents residing in the remaining 212 zip code areas of Baltimore City.
- 3.1.5 **Workforce Development Pipeline** is the mechanism developed by EBDI, via a partnership with the Mayor’s Office of Employment Development (MOED), that provides:
- 3.1.5.1 a pathway for East Baltimore residents to get assessed, obtain job readiness skills, industry-specific customized training, career coaching, job placement, and retention services; and
- 3.1.5.2 a pathway that assists businesses with meeting local hiring requirements in their contracts by helping them to identify emerging job opportunities, develop customized training programs for the jobs, and then identify appropriate residents to enroll in the customized training and ultimately get placed in appropriate jobs.
- 3.1.6 All businesses and contractors under contract within the EBDI project area are obligated to maintain the records necessary to demonstrate that they have conducted the research and undertaken the activities necessary to use the Workforce Pipeline as their first source for recruiting local residents for jobs.

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3.1.7 **Bidder** is an entity who has submitted a proposal in response to a Request for Proposal (RFP) or Request for Qualifications (RFQ) within the EBDI project area.

3.1.8 **Contractor** is an entity that is a party to a contract with EBDI or with another development entity operating within the EBDI project area.

4. Independent Third-Party Monitoring

4.1 In an effort to objectively report the outcomes of EBDI's Economic Inclusion activities, the Owner has employed the services of independent Third-Party Monitoring Contractor(s) to act as its representative(s) on matters regarding the development, implementation and monitoring of this Plan. Third-Party Monitoring Contractor(s) is/are managed by EBDI's Senior Director of Community and Human Services, or by another development entity operating within the EBDI project area. The aforementioned parties along with EBDI's Workforce Development Associate, who is responsible for the day-to-day coordination of EBDI's Senior Director of Community and Human Services and the Governor's Office of Minority Affairs are collectively referred to as the "Economic Inclusion Team". Contractors, suppliers and service providers shall work with and cooperate fully with the efforts of the Economic Inclusion Team.

4.2 Contractor shall timely fulfill the Economic Inclusion Team's requests for information that the Economic Inclusion Team requires to verify or validate Contractor's compliance with the provisions of this Section and the content of the Contractor-authored/Owner-approved inclusion plan that supplements and provides additional detail regarding Contractor's satisfaction of the goals, subject matter and requirements in this Section.

5. Non-Discrimination Policy

5.1 Contractor shall (a) ensure that it shall not discriminate on the basis of race, color, religion, gender or natural origin in the award and performance of its contract and/or any sub-contracts that may be needed to perform the work or services hereunder, (b) ensure that it shall not discriminate on the basis of race, color, religion, gender or natural origin in project with respect to all employment practices, (c) comply with all applicable requirements of any federal, state or local law, ordinance or regulation relating to affirmative action, equal opportunity and nondiscrimination in employment, and (d) shall use its best practical efforts to meet all local goals relating thereto.

6. Economic Inclusion Goals

6.1 See requirements for prime-level joint venturing below. If joint venturing satisfies the specified requirements, it shall be credited toward the following goals.

6.2 Contractor shall comply with the following subcontracting goals. In addition to performing its own independent marketing, business development and research, Contractor shall use the EBDI Local Vendor Directory to identify local minority and women subcontractors, and the EBDI Workforce Pipeline for identifying local residents for job opportunities.

6.3 **Contracting Goals:** Comply with the following subcontracting goals for subcontracts/prime-level joint ventures:

6.3.1 Construction Contracts:

6.3.1.1 27% MBE + 8% WBE = 35% of total contract value;

6.3.1.2 20% LBE of total contract value

6.3.2 Design, Architecture, and Engineering-related contracts:

6.3.2.1 21% MBE + 13% WBE = 34% of total contract value

6.3.2.2 20% LBE of total contract value

6.3.3 Professional/General Service Contracts:

6.3.3.1 17% MBE + 9% WBE = 26% of total contract value

6.4 Workforce Inclusion Goals: Comply with the following workforce inclusion goals:

6.4.1 Commercial Construction Trades Work and Labor

6.4.1.1 **Minimum Local Participation:** Contractors performing commercial construction trades work and labor shall ensure **twenty percent (20%)** of the total work hours are performed by local minority and women residents (utilizing the specified 3-level LBE priority system).

6.4.1.2 **Minimum Local Hiring Level/Duration:** Contractor shall fulfill its Owner-approved commitment to hire a minimum number of local (per three-tier geographical priority system set out herein) personnel that it (and its subcontractors at all levels) shall employ utilizing the EBDI pipeline. In executing such new hires, Contractor shall develop and obtain Owner approval for a Contractor-authored hiring plan that places a priority on (a) hiring of local minorities and women, (b) hiring of same into skilled trades/vocations, (c) formal apprenticeship of such new hires, (d) structured on-site and off-site training of such new hires and (e) maximizing long-term retention of such new hires.

6.4.1.3 **Hiring Plan:** In coordination with the above minimum local and new hiring levels/durations. Contractor shall fulfill an Owner-approved hiring plan as described below in this specification section.

6.4.2 Residential Construction:

6.4.2.1 Contractors performing residential construction trades work and labor shall ensure **twenty percent (20%)** of the total work hours are performed by local minority and women residents.

7. Implementation Protocols

7.1 **Scope of Covered Projects/Contracts** – The contracting goals referenced in this Plan shall apply to all contracts valued at fifty thousand dollars (\$50,000.00) or greater with respect to deconstruction, demolition, site preparation, construction projects, professional/general services, and/or any other eligible contracted services. The workforce inclusion goals shall apply to any other construction contracts and operating, food, and services contracts that the Economic Inclusion Team deems appropriate.

7.2 **Competitive Bidding and Non-Discrimination** – Contractor is not required to engage Targeted Business Enterprises that are not the lowest responsive and qualified bidders, or that otherwise are not competitive with respect to quality, service, delivery time or price. However, any contractor that proposes such deviation from the requirements of this specification shall maintain records that shall demonstrate to the satisfaction of the Economic Inclusion Team that the bidder has taken all reasonable steps to avoid such deviation.

7.3 **Administration** - The Owner and the Economic Inclusion Team will take the following actions to ensure that Contracts shall be awarded and administered in accordance with the specified standards and procedures:

7.3.1 Based on the scope of the project procured, advertisements for bids shall be posted on the EBDI website and in minority-owned and non-minority-owned media no less than 14 days before bids are due;

7.3.2 A written notification shall be sent to minority and women-oriented trade associations and contractors' associations about the availabilities of contracting opportunities no less than 10 days before bids are due;

7.3.3 Contractor shall use the City's and Maryland State's directories of registered minority business enterprises, women's business enterprises, local business enterprises in the public domain; and EBDI's Local Vendor Directory to identify qualified M/W/LBEs for various projects;

7.3.4 Contractor shall provide sub-bidders, as needed, with information on Targeted Business Enterprises, who are qualified to provide the services, materials, equipment or supplies required for the project. The

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Economic Inclusion Team shall provide the electronic mail addresses of Targeted Business Enterprises whenever applicable at the request of any Bidder;

- 7.3.5 Contractor shall evaluate all contracting opportunities in an effort to divide the total requirements of a contract in a manner that will maximize opportunities for minority and women business enterprises;
- 7.3.6 Contractor shall establish policies to make best practical efforts to (a) ensure that all contractors submitting proper invoices are paid within 30 days upon receipt of such, and (b) make special payment arrangements for selected L/M/W subcontractors when necessary to support particular cash flow needs; and
- 7.3.7 Ensure that all statistics and documentation required under this specification are submitted to the EBDI Inclusion Team's compliance and monitoring team on an appropriate periodic basis and as requested.

8. Achieving EBDI's Economic Inclusion Goals

- 8.1 **MBE/WBE/LBE Contracting** – Contractor shall submit an Economic Inclusion Plan and Manpower Projection Plan that outlines how it will achieve the contracting and local hiring goals for the entire project. This may be a requirement of the initial solicitation. In an effort to maximize inclusion, the bid documents may require the prime contractor to have their first and second tier sub-contractors submit for review an Economic Inclusion Plan (EIP) and Manpower Projection Plan (MPP). Beyond these two tiers, Contractor shall explore inclusion at all levels of opportunity. EBDI will collect and verify documentation to track inclusion at all levels of the project, and Contractor is therefore responsible to ensure that EBDI is provided the appropriate documentation in a timely and complete form.
- 8.2 If initial procurement is at the stage where details of the EIP and MPP are unknown, then as part of Contractor's response to the bid, Contractor shall convey its commitment to and experience in maximizing MBE/WBE/LBE participation and local hiring and how they would apply those steps, past successes/lessons learned and others on the project in East Baltimore. Prior to execution of the Contractor's contract, a detailed EIP and MPP will be required from the Contractor. This may be required at the time, or within a defined period, of the submission of Contractor's bid.
- 8.3 For projects and/or contracts that include multiple categories of contracts, such as construction, architecture/engineering/design, and professional and/or general services, which have different goals, the goal for each category will be monitored separately.
- 8.4 To achieve the MBE/WBE/LBE inclusion goals, prime contractors will get credit for work self-performed by MBE/WBE/LBE subcontractors, PLUS any work that any such subcontractor may subcontract to additional certified MBE/WBE and LBE firms. Neither Contractor nor its subcontractors will get credit towards inclusion participation for any portion of their contracts or subcontracts that is subcontracted to non-certified MBE/WBE and LBE firms. When Contractor and its subcontractors subcontract with firms that satisfy both MBE and WBE qualifications, Contractor and subcontractors can choose which category such qualifying subcontracts shall be counted towards on a contract-by-contract basis; however, they can only be counted as either an MBE or a WBE, not as both.
- 8.5 **Local Minority and Female Resident Employment**
 - 8.5.1 The achievement of minority, female and local residents workforce inclusion goals will be based on the actual number of local, minority and female residents performing skilled and unskilled employee hours divided by the total actual quantity of on-site skilled and unskilled employee hours worked. The hours worked shall be verified by Contractor's and subcontractors' payrolls. Contractor shall organize and structure its record-keeping to facilitate the division of this information into each of local, minority and female workers on the project.

8.6 Best Practical Efforts To Achieve Inclusion Goals

8.6.1 Contractor shall use its best practical efforts to meet or exceed the inclusion goals specified herein insofar as potential LBE, MBE and WBE subcontractors are available and competitive with respect to quality, service, delivery time, and price. As appropriate or needed, the Economic Inclusion Team may determine different inclusion goals for a Covered Project other than what is listed above based on the City's Disparity Study, along with the diversity, depth of talent and entrepreneurial capabilities of the population of the City of Baltimore. This will be determined on a project-by-project basis and will be included in each RFP and respective Covered Contract.

8.7 Implementation of "Best Practical Effort" Standard To Achieve Contracting and Employment Goals

8.7.1 The requirements relative to monitoring best practical efforts of contractors and service providers as to contracts shall include the following:

8.7.1.1 Documentation of Best Practical Efforts and Compliance

8.7.1.1.1 The following two components have been established for Projects to facilitate the inclusion of MBE/WBE/LBE firms as contractors and minorities/females/local residents as site workforce participants. In order to demonstrate their commitment and a specific and executable plan of action, all Bidders shall submit with their bids:

8.7.1.1.1.1 An Economic Inclusion Plan (See bid form for template); and

8.7.1.1.1.2 A Manpower Projection Plan (See bid form for template).

8.7.1.2 Establishing Good Faith Best Practical Effort

8.7.1.2.1 If the Bidder's Economic Inclusion Plan and Manpower Projection Plan does not meet or exceed the established goals, the Contractor must prepare a Subcontracting/Vendor Plan showing how it has made a good faith "best effort" to achieve the project goals. This plan must include, but not be limited to, the following:

8.7.1.2.1.1 Written request for assistance to the Economic Inclusion Team a minimum of ten business days prior to the bid due date;

8.7.1.2.1.2 Solicitation through newspapers, advertisements, job fairs, etc.;

8.7.1.2.1.3 Telephone logs;

8.7.1.2.1.4 Bid results and reasons why awards were made at variance with the specified goals;

8.7.1.2.1.5 Use of City/State-certified business firms via their directory;

8.7.1.2.1.6 Correspondence between bidder's (and sub-bidders', as applicable) firm(s) and any MBE/WBE/LBE firms.

8.8 Good Faith Non-Compliance Finding

8.8.1 In cases where Owner and the Economic Inclusion Team has cause to believe that a Bidder or Contractor, acting in good faith, has failed to comply with the provisions of the plan, Owner shall attempt to resolve the noncompliance through conciliation and persuasion. In conciliation, the Bidder or Contractor must satisfy Owner and the Team that it has its "Best Efforts" to achieve the agreed upon participation goals. "Best Efforts" on the part of the Bidder or Contractor include:

8.8.1.1 Entering into a contractual relationship with the designated certified MBE/WBE/LBE in a timely manner, and fulfilling all contractual requirements.

- 8.8.1.2 Notifying both the certified MBE/WBE/LBE Sub-Contractor and the Economic Inclusion Team of any problem in a timely manner.
- 8.8.1.3 Requesting assistance from Economic Inclusion Team in resolving any problems with the certified MBE/WBE/LBE Sub-Contractor.
- 8.8.1.4 Making every reasonable effort to assist the certified MBE/WBE/LBE Sub- Contractor in the performance of its work.

8.9 Non-Compliance Investigation

- 8.9.1 In cases where the Economic Inclusion Team has cause to believe that any Bidder or Contractor has failed to comply with the provisions of this Plan, the Economic Inclusion Team shall be empowered to conduct an investigation. The steps of the Non-Compliance Investigation will include:
 - 8.9.1.1 Interviewing the Bidder or Contractor to determine what steps were taken to achieve inclusion.
 - 8.9.1.2 Reviewing the Bidder or Contractor's Best and Good Faith Efforts (B&GFE) documentation.
 - 8.9.1.3 Contacting and/or Interviewing the Bidder's or Contractor's sub-contractors listed in the B&GFE documentation.
 - 8.9.1.4 Notifying the development entity (that is bidding the contract involved) of the findings.

8.10 Non-Compliance Finding

- 8.10.1 After reviewing the Bidder's or Contractor's efforts to obtain the needed Targeted Business Enterprises, if these efforts are found to be non-compliant with this Plan, the Economic Inclusion Team will notify the Owner and the Owner will provide notice to the Contractor of the non-compliance finding and give the Contractor an opportunity to either rectify the matter or give further justification for the non-compliance. Should the Contractor not be able to rectify or give ample justification, the Economic Inclusion Team is authorized to recommend sanctions for each violation of these procedures. Such sanctions may include, but are not limited to:
 - 8.10.1.1 Declaring the Contractor's proposal as non-responsive and deeming the Contractor as ineligible to receive the award of the contract or any other future contracts.
 - 8.10.1.2 Suspending the violating Bidder or Contractor from doing business with EBDI (or any other development entity operating within the EBDI project area) for a set period of time.
 - 8.10.1.3 Terminating the contract with the Contractor, as permitted by its terms, and all future payments under the Contract. Decisions will be made collectively by the Contract Manager, Economic Inclusion Team, CFO, CEO and/or other development entity that is bidding or has awarded the contract involved.
 - 8.10.1.4 Pursuing and securing any relief which EBDI and/or the Economic Inclusion Team may deem to be necessary, proper, and in the best interest of EBDI.

8.11 Waiver of Inclusion Participation

- 8.11.1 Owner recognizes that in certain limited circumstances, compliance with this Plan will not be feasible, nor in the best interest of the Project. The following contracts may be exempted by Owner:
 - 8.11.1.1 A contract where the total dollar amount of the contract is less than fifty thousand dollars (\$50,000.00);
 - 8.11.1.2 Any public exigency or emergency contract for which the nature of the emergency will not allow for a delay in a competitive solicitation.
- 8.11.2 Contractor shall make every effort to assure that Targeted Business Enterprises areas are included in the solicitation and award of all contracts.

8.12 Joint Venture Requirements

- 8.12.1 Joint ventures (which shall include functionally equivalent formalized written teaming agreements) between majority-owned Prime Contractors and MBE/WBE firms are encouraged. When evaluating bids or proposals from Contractors, preference shall be given to respondents that utilize joint ventures with MBE's, WBE's and/or LBE's as part of the satisfaction of the specified M/W/LBE goals. The value of work assigned to qualified M/W/LBE contractors at the prime level shall be credited to the calculation of Contractor's satisfaction of specified M/W/LBE goals. Contractors utilizing joint ventures are still responsible to fully satisfy economic inclusion subcontracting goals specified herein for the aggregated scope of Contractor's contract.
- 8.12.2 Bidders intending to Joint Venture shall submit the Joint Venture Questionnaire (See bid form) with their bids/proposals. In addition to completing the form included in the bid form, the Bidder shall discuss specific MBE/WBE/LBE firms that it plans to partner with. With its bid/offer, if Offeror has elected to create a co-prime, partnership, joint-venture or other like arrangement with an MBE/WBE/LBE firm, Offeror shall provide a copy of the legally binding contract outlining the agreement between the Offeror and its MBE/WBE joint venture partner(s). This contract shall be fully executed by the parties involved and shall set out the obligations of each party, the decision-making power of each entity, their roles in the execution of the Project work, their equity participation levels, their division of work, costs and profits/losses (the latter three expressed in dollar amounts) and any other documentation deemed necessary to prove that the joint venture agreement is substantial and meaningful.
- 8.12.3 Joint Venture partnership(s) must meet the following criteria.
- 8.12.3.1 The MBE/WBE/LBE partner must be certified (prior to proposal submission) by the governmental entities specified herein;
- 8.12.3.2 The MBE/WBE/LBE partner must be substantially involved in significant phases of the contract including, but not limited to, the performance of a portion of the onsite work (including general conditions) with its own work force, and the administrative responsibilities such as bidding, planning, staffing and daily management;
- 8.12.3.3 The business arrangements must be customary (i.e., each partner shares in the risk and profits of the joint venture commensurate with their respective ownership interests); and
- 8.12.3.4 If the certified MBE/WBE partner(s) is/are self-performing a portion of the work, this may be credited towards the achievement of the Contractor's inclusion goals; however, the joint venture will still be required to meet the overall subcontracting goals.

8.13 Workforce Related Roles and Responsibilities of Contractor

- 8.13.1 The following protocols shall be followed by Bidders or Contractors on projects with Workforce Inclusion requirements.
- 8.13.1.1 **Hiring Plan Submittal:** With its bid submission (if required by the bid documents) or within 20 days following notice to proceed for the Work, Contractor shall submit a detailed trade by trade hiring plan for Owner's review and approval. Subject plan shall (a) show hiring by trade classification and sub-classification (journeyman, apprentice and new hire/apprentice), (b) distribute each trade sub-classification over the Contract Time, (b) satisfy the minimum new and local hiring levels specified herein, and (c) include all field labor in the Work, spanning Contractor's self-performed work and that of all subcontractors at all tiers. The Hiring Plan shall outline the positions to be filled by current employees and those that will be filled by new hires (Note: For the purposes of this Agreement, the term new hires is defined as an individual representing a discrete new full-time hire by the Contractor, who (except for entities within the designated 11 ZIP codes) was not previously employed by the

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- Contractor, its subsidiary, a joint-venture involving the Contractor, or an agent thereof; and/or did not transfer to the Project site from another project under the employment of any said entities). Contractor shall make its best efforts to fulfill Owner-requested enhancements to the hiring plan. Contractor shall fulfill the Owner-approved hiring plan and shall provide monthly updates to validate progress against such approved plan. Contractor shall timely submit any proposed deviations to the hiring plan to the Owner for review and approval.
- 8.13.1.2 Contractor shall provide a point of contact (a) with decision-making authority for hiring employees, (b) who will manage this process and (c) work closely with the Economic Inclusion Team;
- 8.13.1.3 Contractor shall use EBDI's Workforce Pipeline as the first source for recruiting and hiring local residents for any new job opportunities and, to the extent practical without impacting productivity, give EBDI five business days to identify and refer candidates for the job before using other sources to recruit locally (Note: For the purposes of this Agreement, the term first source relates solely to using EBDI's Workforce Development Pipeline as the first means to identify and recruit qualified local residents for job opportunities stemming from the EBDI project, thereby maximizing the ability for EBDI project-based and other East Baltimore residents to get priority status for these employment opportunities.)
- 8.13.1.4 Contractor shall comply with the established Standard Operating Procedures (See Attachment A to this section) as well as comply with the following requirements, which include, but are not limited to:
- 8.13.1.4.1 Contractor shall submit all new job requirements and postings with relevant qualifications and skills to the Economic Inclusion Team;
- 8.13.1.4.2 Contractor shall maintain records as necessary to prove that it followed the three-tier priority system for local hiring;
- 8.13.1.4.3 Contractor shall notify the Economic Inclusion Team when time is of the essence to hire workers and work together with the Team to develop an agreed upon plan of action;
- 8.13.1.4.4 Contractor shall submit on-going reports on the outcome of all interviews for EBDI-referred candidates and their hiring status;
- 8.13.1.4.5 During the course of the project, Contractor is required to give written notice to Owner of any deviations to their manpower projection plans, for any reason; and
- 8.13.1.4.6 Contractor shall refer all residents, who walk up seeking employment with them directly, to EBDI to get them engaged in the Workforce Development Pipeline, if they qualify;
- 8.13.1.4.7 To the extent that, despite Contractor's satisfaction of the above requirements to use the EBDI Workforce Development Pipeline as its first source to hire local residents, this process did not avail any qualified candidates, Contractor may fulfill their goals by using non-EBDI sources (including walk-ons to the Project residing in the designated 11 ZIP codes) to hire local, minority and women as defined by this Agreement, but Contractor shall obtain Owner's express written concurrence before doing so;
- 8.13.1.4.8 In all hiring activities, Contractor shall follow the three-level geographical priority system specified herein; and
- 8.13.1.4.9 Contractor shall support a key objective of the Project, which is to provide employment opportunities to the residents of East Baltimore and support them in competing successfully for new jobs generated by the Project. Contractor agrees to implement its own job retention efforts and shall also assist EBDI in outreach and coordination efforts to ensure East Baltimore residents who are hired pursuant to this agreement, stay engaged with the Pipeline to promote job retention, additional skills training, and employment upgrades. These efforts may include, but are not limited to, training during employment to

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position candidate for subsequent re-employment, additional post-employment training (including skilled apprenticeship training), Job Fairs and attendance at coordination meetings.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01 45 00

QUALITY CONTROL

PART 1 GENERAL

SUMMARY

1. Owner shall provide and pay for services of independent Testing and Inspection Agency(ies). Subject Agencies shall perform testing and inspection of construction materials and procedures for conformity with the Contract Documents for the following, to the extent they are applicable to Project:
 - (a) Earthwork, including inspection of subgrades by geotechnical engineer.
 - (b) Concrete work, including finished floor tolerance.
 - (c) Structural and miscellaneous steel
 - (d) Steel decking
 - (e) Baseplate grout
 - (f) Roofing system and roof insulation
 - (g) Unit masonry
 - (h) Precast panel systems
 - (i) Code - required special inspections
 - (j) Testing and Balancing per mechanical specifications.
 - (k) Other work specified herein.
2. Contractor shall pay for retesting required due to failed tests.
3. Coordinate the work under this Section with pertinent requirements under Specifications.
4. Provide access to the Work for Testing and Inspection Agencies employed by Owner by ceasing work in areas where tests and inspections are required, providing samples for testing, providing means of protecting and transporting samples on the Project site and furnishing safety equipment and ladders, scaffolding and lighting.
5. Wherever required by the Contract Documents and as directed by the Owner, submit documents prepared by Contractor under this Section to Owner for approval.
6. Allow and assist Owner and its Testing and Inspection Agencies to continuously inspect the Work, including any and all items of material and equipment, at all stages of the development and fabrication, both on and off the Project site.

SUBMITTALS

1. Testing and Inspection Agency shall submit Certified written report of each test, inspection or similar service to Contractor (one copy) and the Owner.
2. Report Data: Written reports of each test inspection or similar service shall include:

- (a) Date of issue
- (b) Project title and number
- (c) Name, address and telephone number of Testing and Inspection Agency
- (d) Dates and locations of samples and tests or inspections
- (e) Names of individuals making inspection or test
- (f) Designation of the work and test method
- (g) Identification of product and Specification Section
- (h) Complete inspection or test data
- (i) Test results and an interpretations of test results
- (j) Ambient conditions at time of sample-taking and testing
- (k) Professional recommendation as to whether inspected or tested work complies with Contract Document requirements
- (l) Name and signature of laboratory inspector
- (m) Recommendations on retesting

QUALITY ASSURANCE

1. Testing and Inspection Agency will satisfy the following requirements:
 - (a) Testing and inspection agency shall be authorized by the State of Maryland, and shall employ a full time registered Professional Engineer, licensed in that State, to review services.
 - (b) Certifications are to be signed and sealed by a Professional Engineer licensed in the State of Maryland and knowledgeable in the engineering discipline associated with the inspection, test and other service or work for which the certification pertains.
 - (c) Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Institute of Science and Technology (NIST) Standards or accepted values of natural physical constants.
 - (d) Comply with the following standards, as applicable to the activity involved, in addition to standards specified in other Sections:
 - (i) ASTM C802 - Practice for Conducting an Interlaboratory Test Program to Determine the Precision of Test Methods for Construction Materials.
 - (ii) ASTM C1021 - Practice for Laboratories Engaged in the Testing of Building Sealants.
 - (iii) ASTM C1077 - Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
 - (iv) ASTM D3740 - Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

- (v) ASTM D4561 - Practice for Quality Control Systems for Inspection and Testing Agency for Bituminous Paving Materials.
 - (vi) ASTM E329 - Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
 - (vii) ASTM E543 - Practice for Agencies Performing Nondestructive Testing.
 - (viii) ASTM E2174 – Standard Practice for On-Site Inspection of Installed Fire Stops.
 - (ix) Meet requirements of American Council of Independent Laboratories' "Recommended Requirements of Independent Laboratory Qualification", latest edition and satisfying the inspection criteria of Materials Reference Laboratory of National Institute of Standards and Technology.
 - (x) When performing work in connection with concrete, steel, and bituminous materials, comply with ASTM E329 and ASTM D3666.
 - (xi) When engaged in the testing and inspection of soils and rock or performing non-destructive testing, comply with ASTM D3740 and ASTM E543, respectively.
 - (xii) Testing laboratories testing and inspecting masonry shall meet requirements of ASTM-C1093.
 - (xiii) Testing laboratories performing work not in connection with concrete, steel, bituminous materials, soils and non-destructive testing shall comply with ASTM E548.
- (e) Laboratory Inspection: Prior to approval, the laboratory shall submit in writing the following:
- (f) Functional description of the laboratory's organizational structure, operations departments and support departments and services.
- (i) A list and resumes of the personnel assigned to the proposed testing, including the person charged with engineering managerial responsibility.
 - (ii) Affidavit of compliance with the applicable ASTM publication and certification that the laboratory performs work in accordance with technical requirements as required by Specifications.
 - (iii) A list of test and inspection equipment for each of the proposed test procedures and certification that the equipment is calibrated at prescribed intervals to ensure the validity of the test and inspection data, in accordance with accredited independent calibration agency.
 - (iv) A copy of the latest laboratory inspection report by an independent agency with laboratory certification that deficiencies (if any) have been corrected.
- (g) Concrete testing and inspection personnel shall be ACI-certified as Concrete Field Testing Technician - Grade 1.

TESTING AND INSPECTION AGENCY RESPONSIBILITIES

1. Testing and Inspection Agency shall cooperate with the Owner and the Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.

2. Testing and Inspection Agency shall notify the Owner and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
3. Testing and Inspection Agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
4. Testing and Inspection Agency shall not perform any duties of the Contractor.

CONTRACTOR RESPONSIBILITIES

1. The Contractor shall plan and coordinate with agencies performing tests, inspections and similar services and provide auxiliary services as requested. Notify Testing and Inspection Agency sufficiently in advance (minimum two working days) of operations to permit assignment of testing personnel. Provide auxiliary services including:
 - (a) Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate tests and inspections.
 - (b) Take adequate quantities of representative samples of materials that require testing and submit to Testing and Inspection Agency or assist Testing and Inspection Agency in taking samples.
 - (c) Provide facilities for storage and curing of test samples, and delivery of samples to Testing and Inspection Agency. These shall be for Testing Agency's exclusive use.
 - (d) Providing Testing and Inspection Agency with preliminary design mix proposed for use for materials mixes that require control by Testing and Inspection Agency.
 - (e) Provide security and protection of samples and test equipment at the Project site.
 - (f) Furnish Testing and Inspection Agency with mill tests showing heat number and corresponding mill certificates for reinforcing steel and structural steel.
 - (g) Furnish Testing and Inspection Agency with cement mill test reports.
 - (h) Remove and replace work which is rejected as result of tests performed that indicate failure to conform to requirements of Contract Documents.

COORDINATION

1. The Contractor shall coordinate sequence of construction operations with Testing and Inspection Agency to accommodate required testing and inspection services with no effect on the Contract Time.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

EARTHWORK

1. Owner shall employ and pay for professional geotechnical engineer licensed in the State of Maryland and Testing and Inspection Agency to perform for the following, and Contractor shall comply with their recommendations:

- a. Obtain samples of soil proposed for use as fill and perform the following tests:
 - i. Test for suitability including gradation. Advise the Owner and the Contractor whether soil is suitable for proposed use.
 - ii. If soil is found to be suitable, establish optimum moisture/density relationship in accordance with ASTM D1557. Use results to control fill placement and compaction operations.
- b. Inspect subgrade preparation and proofrolling operations. Review and recommend proofrolling equipment. Determine soft areas and advise Contractor to undercut and replace with structural fill.
- c. Inspect footing subgrades prior to placement of concrete and verify that allowable soil bearing capacity meets that required or recommended by Owner-furnished geotechnical report. Advise Owner and the Contractor when footing bottoms need to be reworked or lowered to meet specified bearing capacity.
- d. Inspect fill, backfill and compaction operations. Perform field density tests according to ASTM D1556 or D2922 on each lift of compacted fill at locations adequate to evaluate degree of compaction but not less than 1 test per 900 square feet of building and pavement area with a maximum spacing of 30 feet between test locations and minimum of 1 test per lift.
- e. Notify the Contractor and Owner immediately of test results. When test results fall below specified density, advise the Contractor to rework area and retest until specified density is obtained.

CONCRETE:

1. Testing and Inspection Agency will perform and report to Owner on the following:
 1. Concrete Quality Control:
 - a. Inspect concrete placement, vibration and curing.
 - b. Slump, cylinder and other tests as specified below. Perform tests more frequently than specified as necessary to control quality.
 - c. Obtain samples of aggregates that the Contractor proposes to use and test for compliance with the Specifications.
 - d. Review the Contractor's proposed mix designs. Submit to Contractor and to Owner for review and approval.
 - e. Attend Preconstruction Conference as described in SECTION - CAST-IN-PLACE CONCRETE.
 - f. Inspect and test concrete materials during the Work for compliance with the Specifications and approved mix designs.
 - g. Review consistency of the mix design for each concrete placement.
 2. Concrete Tests
 - a. Sample concrete in accordance with ASTM C172 at the rate of 1 sample per 50 cubic yards or fraction thereof of concrete placed each day. Record placement location of each sample.

- b. Test each sample as follows:
 - Slump test in accordance with ASTM C143
 - For air-entrained mixes, air content test in accordance with ASTM C173
 - For lightweight concrete, unit weight test in accordance with ASTM C13.
 - Measure concrete temperature
 - Submit test results on a weekly basis
 - c. From each sample, make and cure 6 test cylinders in accordance with ASTM C31. Compression test cylinders in accordance with ASTM C39 as follows:
 - 1) Test 2 cylinders at 7 days.
 - 2) Test 2 cylinders at 28 days.
 - 3) Hold 2 cylinders in reserve in the event additional testing is determined necessary by the Owner.
 - d. Prepare and maintain a continuous up-to-date log of concrete strength test results in both graphical and tabulated form for each type of concrete used. A strength test shall be the average strength of two cylinders made from same sample of concrete and tested at 28 days. Submit updated copy of log to the Owner on a weekly basis. Each submittal shall state current average strength and standard deviation.
 - e. Cement Mill Test Reports
 - (1) Obtain mill test reports from the Contractor for cement used in each concrete placement sampled.
 - (2) Review cement mill test reports and attach them to sample test result submittals. Submit to Owner for record.
3. Pre-Placement Sign-Off Form
- a. Prior to placement of concrete, Contractor shall:
 - (i) inspect placement of reinforcement, including size, type, location, spacing, splices, clearance between bars and forms, firmness of installation and security of supports and ties.
 - (ii) inspect placement of rigid screeds for placement of concrete floors, and verify that they are correctly spaced, located and anchored.
 - (iii) Satisfy Owner that Contractor has timely obtained signatures of Contractor and mechanical, plumbing, electrical and any other relevant subcontractors on Owner's pre-pour inspection form, validating that the above reinforcing and screed requirements have been satisfied, that all embeds are anchored and protected in the correct locations and that penetrations, block-outs and other features are correctly located in the formwork.
 - (iv) Not order concrete until Contractor has given Owner an opportunity to review the proposed concrete placement area. Provide Owner a minimum

of 2 hours review time, and allow Contractor deficiency correction time before any concrete is delivered to site. Contractor shall make its best effort to complete the foregoing activities the day before each concrete placement. Owner is entitled to prevent Contractor from placing any concrete until Owner is satisfied that all deficiencies are corrected. Contractor's failure to follow these time and procedure requirements may result in Owner rejecting loads of concrete delivered to site and Contractor paying therefor.

- b. Contractor may not order concrete for placement until the foregoing form is fully signed off. Contractor shall remove ready-mix trucks from the project site if this requirement is not followed.

4. Concrete Batch Plant Inspection by Testing Agency

- a. Provide qualified inspector and apparatus to inspect weighing and batching of concrete at batch plant. Inspect batch plant on first day that each different mix is used on the Project and at least once more on a random basis.
- b. Check whether materials being used are in accordance with approved mix designs.
- c. Measure moisture content of aggregate stockpiles and check whether batch weights are being adjusted to compensate for variations in moisture content.
- d. Submit promptly to Owner certification of weights used in loads of accepted concrete batched during plant inspection.

5. Additional Tests:

- a. Testing and Inspection Agency shall make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in structure, as directed by the Owner. Agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods as directed. The Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is discovered.

6. Floor Tolerance Measurements:

- a. Testing and Inspection Agency will perform tests for determining floor flatness and levelness in accordance with ASTM E1155 (unless the detailed technical specifications have stricter requirements) within 16 hours after completion of final troweling operations and before forms and shores have been removed. Tests shall be performed using Type I or Type II apparatus. Contractor shall correct any material anomalies.

STRUCTURAL STEEL

- 1. To the extent applicable on Project, Testing and Inspection Agency shall perform the following:
 - b. Tests and inspection of structural steel by Testing and Inspection Agency shall be as follows:

- i. Test of Mill Order ASTM A36, ASTM A572, Grades 50 Steel: Where ASTM A36 and ASTM A572 steel, ordered from mill, cut to lengths, are identified with shipment tags at the Project site, by heat or melt numbers and are accompanied by corresponding mill analysis test reports, use these material without further local tests, provided that an affidavit is given that materials conform with requirements and that Owner receives a copy of such documentation for the record. In case of controversy, or upon Owner request, tension and bend tests of materials, either locally or at mill, as required for local stock.
 - ii. Test of Local Stock Steel: If local stock structural steel can be identified with shipment tags at the Project site, by heat or melt numbers and is accompanied by corresponding mill analysis and test reports, stock may be used, provided that one tension and one bend test are made for each 10 tons or fractional part thereof, of stock used in the Work for each type and source of reinforcing and rolled structural steel shape. Provide complete four-sided surface inspection for materials. Test and stamp each piece for high-strength local stock steel. Allow Owner to witness tests.
 - iii. Test specimens shall be taken by the Contractor under direction of Testing and Inspection Agency and shall be machined by Testing and Inspection Agency to dimensions required by related applicable standard ASTM Specifications. Allow Owner to witness tests.
- c. Ultrasonic Material Inspection
- i. Material, 3/4 inch or greater in thickness, in the following connections shall be ultrasonically tested in accordance with ASTM A388, ASTM A745 and ASTM E317 for laminations:
 - 1. Column material within 6 inches either side of girder flanges where girder flanges are direct butt-welded to column, unless otherwise noted on the Drawings.
 - 2. Test, at shop, cap plate material, baseplate material and bearing plates material within 6 inches either side of direct butt weld.
 - 3. Test material in designated location for lamination by ultrasonic means before fabrication, in accordance with AWS D1.1 as amended and as specified herein.
 - 4. Detection of Laminations: Rejectable defects discovered by ultrasonic means are defined as follows:
 - a. Using suitable calibrated ultrasonic equipment, flaw indications must result in 100 percent loss of back reflection over entire area of defect. Maximum permissible area of flaw indication shall be 3 square inches with maximum permissible length of 4 inches.
 - b. If flaws are detected, they may be repaired by welding, subject to review by the Owner.

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- c. Flaws with area or length greater than criteria set out in paragraph (a) above shall be cause for complete rejection of material being tested. Contractor shall remove this material from the Work.
- d. Tests of Field Welding: Testing and Inspection Agency shall visually inspect field welding. Testing and Inspection Agency shall comply with regulations of governing local codes and shall certify in writing, upon completion of the Work, that field welding was performed in accordance with Construction Documents and applicable ordinances.
- e. Qualifications of Welders: By means of bend-testing of coupons, qualify each welder employed for any kind of on-site welding by any trade, for any purpose and allow Owner to witness qualification testing. Verify certification of each welder on job, and his qualifications for particular position in which he will work on any of: structure, miscellaneous metals, or MEP-related fabrications, details or assemblies. Testing agency shall maintain records of such qualifications available for review by Owner upon request. Contractor shall mark all field welds with mark that is unique and traceable to each individual welder. Re-qualification of welders may be required if welders' work indicates a need or upon Owner request. Contractor shall ensure that welders shall hold current certification for particular position in which each person is working. Welders may perform field welds under a Project-specific certificate, provided the Testing and Inspection Agency tests and certifies such welders for the positions, procedures, rods and metallurgy concerned.
- f. Continuous Inspection of Welds: Inspect field-welded connection by visual, liquid penetrant, ultrasonic, or other approved nondestructive tests. "Random" tests are defined as:
 - 1) at least one test per assembly type, for each weld type or,
 - 2) at least 5% of all welds of a particular type per assembly type, whichever yields the higher number. Upon location of a defect indicated by random testing, perform ever-widening tests within the immediate category of work and related categories, of types and scope recommended and approved by Owner, until the full scope and extent of such defects is identified and corrected by Contractor.

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TABLE: INSPECTION AND TESTS FOR VARIOUS APPLICATIONS

Application	Inspection or Tests Required			
	Visual	Radio-graphic	Liquid Penetrant	Ultrasonic
Structural Steel				
(a) Tack weld	Yes	No	No	No
(b) Root pass	Yes	No	Random	No
(c) Intermediate passes	Yes	No	No	No
(d) Completed weld	Yes	No	Random	Random
c. Visual Inspection:	Required for field tack welds, root welds, intermediate passes and completed welds.			
d. Ultrasonic Testing:	Required for field butt welds, full penetration welds, partial penetration welds and groove welds as described in Paragraph, Ultrasonic Testing.			
e. Particle/Liquid Penetrant Testing				
1)	Required for field fillet welds.			
2)	Test Method: As determined by Testing and Inspection Agency.			
f. Ultrasonic Testing				
1)	Perform complete ultrasonic testing according to AWS E164, ASTM E317 and ASTM E587 by qualified technician, who shall operate equipment, examine complete weld and maintain record of welds examined, defects found and disposition of each defect. Contractor shall repair defective welds, including retesting of defective welds.			
2)	Initially, welds requiring ultrasonic testing shall be tested for each welder in order to establish qualifications of each individual welder. If rejectable defects occur in less than 5 percent of welds tested, frequency of testing may be reduced to 25 percent of welds for each welder. If more, 100 percent testing shall be re-established until rate is reduced to less than 5 percent. Calculate percentage for each welder independently. Welders who have rejectable weld rate of 5 percent or greater for two consecutive work days or more, shall be immediately removed by Contractor from the Work.			
3)	When ultrasonic indication arising from weld root can be interpreted as either a weld defect or backing strip, remove backing strip and if no root defect is indicated on this retest and no significant amount of base and weld metal have been removed, joint needs no further repair or welding. If defect is indicated, Contractor shall repair it.			

- 4) When ultrasonic testing indicates possible weld defect which would require repair, Contractor may at his option and expense, elect to perform radiographic testing of weld to ascertain if weld defect exists and require repair before performing corrective measures.
 - 5) Questionable root indications that prove not to be defects shall not count against welder to increase test rate.
 - 6) Ultrasonic instrumentation shall be calibrated by technician to evaluate quality of welds in accordance with AWS D1.1 as amended. Maintain calibration records on the Project site.
 - 7) Welds examined visually which indicate possibility of having defects shall be tested. This testing is not included in number of welds to be tested as set out in Paragraph (2) above.
- g. Liquid Penetrant Testing
- 1) Perform liquid penetrant testing in accordance with ASTM E165 by qualified technician, who shall perform tests, interpret results with respect to quality of weld and repairs and maintain record of welds examined, defects found and disposition of each defect. Defective weld shall be repaired and costs including retesting of defective welds shall be borne by Contractor.
 - 2) Initially, welds requiring penetrant testing shall be retested at rate of 100 percent of first 21 welds for each welder. If rejectable defects occur in less than 5 percent of welds tested, frequency of welds tested may be reduced to 20 percent of welds for each welder. If rate of rejectable defects increases to 5 percent or more, 100 percent testing shall be re-established until rate is reduced to less than 5 percent. Calculate percentage of each welder independently. Contractor shall remove from the Work, welders who have rejectable weld rate of 5 percent or greater, for two or more consecutive work days.
 - 3) When liquid penetrant testing indicates possible defect which would require repair, Contractor may at his option and expense, elect to perform ultrasonic or radiographic testing of weld to ascertain if weld defect exists and requires repair before performing corrective measures.
 - 4) Welds examined visually which indicate possibility of having defects shall be tested. This testing is not included in number of welds to be tested as set out in Paragraph (2) above.
 - 5) Magnetic particle inspection in accordance with ASTM E709 may be used instead of liquid penetrant inspection for welds in carbon steel.
3. Testing of Shop Welds: Visually inspect 100% and ultrasonically test 25% of completed full penetration welds in rigid bents to be erected in the Project.

Defective welds shall be repaired and costs, including retesting, shall be borne by the Contractor.

4. Testing of High Strength Bolted Connections
 - a. Perform periodic checks of high strength steel bolt connections in field. Contractor shall maintain, during erection, manual calibrated torque wrench, and shall provide labor and scaffolding as required for testing and inspection work to be performed by Testing Agency. Testing and Inspection Agency shall also inspect calibrated, manual or power torque equipment intended for use in performing high strength bolting operations, including for MEP work.
 - b. Perform testing in accordance with methods and procedures specified in Sections 5 and 6 of Specifications for "Structural Joints using ASTM A325 of ASTM A490 Bolts" as approved by Research Council on Structural Connections of the Engineering Foundation (RCSC), dated August 14, 1980. If load indicator washers are used, installation and testing procedures shall follow load indicator washer manufacturer's recommendations, including corrections to be made for galvanized installations. Contractor shall install bolts in accordance with requirements of Specification Sections 1 to 5 inclusive (applicable provisions) of RCSC Specifications.

STEEL DECKING

To the extent applicable to Project, Testing and Inspection Agency will perform the following:

1. Field inspection of metal deck for proper type, gauge, finish and erection.
2. Review Contractor-furnished test data and other substantiating evidence showing that proposed metal deck conforms to Contract Documents. Where applicable, conduct tests as set forth in AISI specifications.
3. Provide inspection of welding of steel decking by qualified technician, who shall maintain record of welds examined, defects found and disposition of each weld. Defective welds shall be repaired and costs including retesting of defective welds shall be borne by Contractor.

BASEPLATE GROUT

To the extent applicable to Project, Testing and Inspection Agency will perform the following:

1. Inspect installation of baseplate grout.
2. For every five baseplates grouted, grout strength shall be tested with set of cubes as follows:
 - a. Set of cubes shall consist of three cubes to be tested at seven days and three cubes to be tested at 28 days. Test cubes shall be made and tested in accordance with ASTM C109 with exception that grout should be restrained from expansion by top plate.

ROOFING AND ROOF INSULATION

1. Testing and Inspection Agency will perform the following:
 - a. Quality control inspection during and at completion of roof construction work shall include the following:
 - i. Attending pre-roofing conference prior to installation of roofing.
 - ii. Verify materials delivered to job site are those approved by the Owner.
 - iii. Verify use of installation procedures agreed upon in pre-roofing conference.
 - iv. Inspect roof deck prior to installation of roofing materials.
 - v. Inspection of application and bond of plies.
 - vi. Performing mechanical fastener pull-out test for roof insulation.
 - vii. Inspection of roof drains for missing bolts, broken drain components and foreign materials left in drains.
 - viii. Inspection of roof for roof cuts, holes, flashings and proper terminations in roofing systems.
 - ix. Inspection of roof for temporary night seal at end of each day's work.
 - x. Overall inspection of completed roof work for proper installation.
 - xi. Preparing daily reports describing work performed, weather conditions and manpower. Including daily submission thereof to the Owner.
 - xii. Verify that roofing work constructed meets the requirements of the NRCA.

UNIT MASONRY

1. Testing and Inspection Agency to perform the following:
 - b. Testing and inspection of unit masonry shall be as follows:
 - i. Concrete Masonry Unit Test: Test units for strength, absorption and moisture content in accordance with ASTM C140.
 - ii. Reinforcing Steel and Ties: Inspect placement of reinforcing and ties including size, type, location, spacing, clearances and firmness of installation.
 - iii. Mortar: Inspect mortaring operations. Prepare mortar cubes and test compressive strength in accordance with ASTM C780 "Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry" Annex A7 "Compressive Strength of Molded Masonry Mortar Cylinders and Cubes" at rate of 3 cubes per 2,000 sq. ft. of wall area or portion thereof.
 - iv. Grouting: Inspect grouting operations.

SCHEDULE OF INSPECTIONS AND TESTS

The following Sections provide guidance regarding the minimum quantity of testing and inspection under this Section. In the event the detailed technical specifications or other Contract requirements require more testing and inspection or more stringent testing and inspection, Contractor shall submit its work to such tests and inspection.

1. Division 01 – Commissioning Specification Sections
2. Section 03 05 00 - Concrete.
3. Section 03 08 13 - Concrete Testing and Evaluation - Owner
4. Section 03 41 00 - Precast Structural Concrete.
5. Section 03 45 00 - Architectural Precast Concrete.
6. Section 04 20 00 - Unit Masonry Assemblies.
7. Section 05 12 00 - Structural Steel.
8. Section 05 40 00 - Cold-Formed Metal Framing.
9. Section 07 13 53 - Sheet Waterproofing
10. Section 07 14 00 - Fluid applied Waterproofing
11. Section 07 17 00 - Bentonite Waterproofing.
12. Section 07 24 00 - Exterior Insulation and Finish System (EIFS).
13. Section 07 27 28 - Air/ moisture Barrier Membrane
14. Section 07 71 00 - Roof Specialties
15. Section 07 84 13 - Firestopping and Firesafing.
16. Section 08 44 13 - Metal Framed Curtain Wall System.
17. Section 23 41 33 - HEPA Containment Filter Assemblies.
18. Section 26 05 93 - Electrical Testing and Inspections.
19. Section 31 05 00 - Earthwork, for 31 23 23 - Backfilling and Compaction for excavation and fill.
20. Section 32 12 16 - Asphaltic Concrete Paving.

END OF SECTION

