BRUCKNER VIADUCT DECK REPLACEMENTS

PIN X731.45, Contract D900040

DB CONTRACT DOCUMENTS
PART 8

SPECIAL SPECIFICATIONS

Addendum #3 October 17, 2017
This Part 8 – Special Specifications provides access to, and details the Project-specific requirements for the use of, the following documents:

1. NYSDOT Standard Specifications and Construction Materials
2. NYSDOT Engineering Information Issuances
3. NYSDOT Special Specifications.

NYSDOT Standard Specifications and Construction Materials


The NYSDOT Standard Specifications Construction Materials can be accessed at the following internet link:


NYSDOT Engineering Information Issuances

The Design-Builder shall use the relevant NYSDOT engineering information issuances, which include:

1. Engineering Instructions (EI);
2. Engineering Bulletins (EB);
3. Engineering Directives (ED).

The above listed engineering information issuances can be accessed at the following internet link:


NYSDOT Special Specifications

The Design-Builder may use NYSDOT Special Specifications which are listed in the Electronic Pay Item Catalog (e-PIC) and which have received General Approval, and shall use any NYSDOT Special Specifications which are referenced in this Part 8 or elsewhere in the Contract Documents. Delete and ignore sections in the NYSDOT Special Specifications titled Method of Measurement and Basis of Payment from the NYSDOT Special Specifications.

NYSDOT Special Specifications can be accessed at the following internet link:


The NYSDOT e-PIC may be accessed at the following internet link:

https://www.dot.ny.gov/pic
The following Special Specifications are attached herein:

<table>
<thead>
<tr>
<th>NYSDOT ITEM #</th>
<th>ITEM DESCRIPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>555.80010001</td>
<td>CRACK SEALING BY EPOXY INJECTION (PREVENTION)</td>
</tr>
<tr>
<td>555.80020001</td>
<td>CRACK SEALING BY EPOXY INJECTION (RESTORATION)</td>
</tr>
<tr>
<td>557.11010003</td>
<td>INTEGRAL PRECAST CONCRETE BARRIER</td>
</tr>
<tr>
<td>557.51010018</td>
<td>INTERNAL CURING CONCRETE FOR SUPERSTRUCTURE SLABS WITH INTEGRAL WEARING SURFACE</td>
</tr>
<tr>
<td>557.54010018</td>
<td>INTERNAL CURING CONCRETE FOR STRUCTURAL APPROACH SLAB WITH INTEGRAL WEARING SURFACE</td>
</tr>
<tr>
<td>557.64010103</td>
<td>PRECAST CONCRETE DECK</td>
</tr>
<tr>
<td>565.64nnnn16</td>
<td>BASE ISOLATION BEARING SYSTEMS</td>
</tr>
<tr>
<td>611.190X0024</td>
<td>POST PLANTING CARE WITH REPLACEMENT</td>
</tr>
<tr>
<td>619.22970011</td>
<td>TRAFFIC ENFORCEMENT AGENTS</td>
</tr>
<tr>
<td>634.20010111</td>
<td>PRIMARY PROTECTIVE SHIELDS</td>
</tr>
<tr>
<td>634.20010211</td>
<td>SECONDARY PROTECTIVE SHIELDS</td>
</tr>
<tr>
<td>637.31XX0020</td>
<td>INSPECTION VEHICLES (MAXIMUM BID)</td>
</tr>
<tr>
<td>800.01000015</td>
<td>DESIGN BUILD – DESIGN SERVICES</td>
</tr>
<tr>
<td>800.01000115</td>
<td>DESIGN BUILD – DESIGN SERVICES – RAMP RC (BIN 106666B)</td>
</tr>
<tr>
<td>800.02000015</td>
<td>DESIGN BUILD – CONSTRUCTION INSPECTION SERVICES</td>
</tr>
<tr>
<td>800.02000115</td>
<td>DESIGN BUILD – CONSTRUCTION INSPECTION SERVICES – RAMP RC (BIN 106666B)</td>
</tr>
<tr>
<td>800.03000015</td>
<td>DESIGN BUILD – QUALITY CONTROL SERVICES</td>
</tr>
<tr>
<td>800.03000115</td>
<td>DESIGN BUILD – QUALITY CONTROL SERVICES – RAMP RC (BIN 106666B)</td>
</tr>
<tr>
<td>800.04000015</td>
<td>DESIGN BUILD – FORCE ACCOUNT WORK</td>
</tr>
<tr>
<td>800.05000015</td>
<td>DESIGN BUILD – SITE MOBILIZATION</td>
</tr>
<tr>
<td>800.06000115</td>
<td>DESIGN BUILD – CONSTRUCTION WORK</td>
</tr>
<tr>
<td>800.06010015</td>
<td>SSRW – DIRECTIVE STEEL REPAIRS</td>
</tr>
<tr>
<td>800.06020015</td>
<td>SSRW – UNANTICIPATED REPAIRS</td>
</tr>
<tr>
<td>800.06060015</td>
<td>CONCRETE SUBSTRUCTURE REPAIR WORK – DIRECTIVE REPAIRS</td>
</tr>
<tr>
<td>800.06070015</td>
<td>CONCRETE SUBSTRUCTURE REPAIR WORK – UNANTICIPATED REPAIRS</td>
</tr>
</tbody>
</table>

In the event of a discrepancy between the version of any Special Specification attached herein and the version available from the NYSDOT web site listed above, the version included in these Contract Documents shall apply.
ITEM 555.80010001 - CRACK SEALING BY EPOXY INJECTION (PREVENTION)
ITEM 555.80020001 - CRACK REPAIR BY EPOXY INJECTION (RESTORATION)

DESCRIPTION: Install injection ports, seal the crack opening, inject the crack with epoxy (full depth for restoration work, or as deep as conditions allow for prevention work), and restore the sealed surface to a flush condition in areas visible to the public. Perform the work at locations indicated on the contract plans or where directed by the Engineer.

PREVENTION - use in contaminated, cracked concrete areas to prevent movement and protect reinforcing.

RESTORATION - use in uncontaminated cracked concrete areas to restore structural integrity. Take verification cores for payment. Have an experienced epoxy manufacturer representative present until the work is acceptable to the Engineer.

MATERIAL REQUIREMENTS:
1. Crack Sealant - epoxy paste that completely cures in 4 hours or less and retains the injected epoxy. Any other type of crack sealant is subject to a project demonstration and approval by the Engineer.

2. Low Viscosity Injection Epoxy - Manufacturer certified to meet ASTM C881, Type I or IV, Grade 1, Class B or C (as temperature conditions require.)

3. Vertical & Overhead Patching Material (Approved List) - (for ITEM 555.80020001) §701-08

INJECTION EQUIPMENT: Use equipment in good working order, as approved by the Engineer, with the following features:

• Separate feed lines to the mixing chamber
• Automatic mixing and metering pump
• Ability to thoroughly mix the epoxy components in the mixing chamber
• Operator control of the epoxy flow from the mixing chamber
• Clean, legible, accurate pressure gauges easily viewable by the operator
• Ability to provide an uninterrupted pressure head to continually force epoxy into the cracks
• Injection pressure from 0 to at least 200 PSI
• Capable of metering each epoxy component to within 3.0% of the epoxy manufacturer's mix ratio

Un-reacted epoxy components may be stored overnight in separate reservoirs and feed lines.

Before starting the work, demonstrate to the Engineer the ability of the equipment to meter and mix epoxy components to the required mix ratio. Ratio accuracy may be determined by simultaneously metering each component into separate, clean, accurately graduated, volumetric containers, or another procedure approved by the Engineer. Also, activate the automatic mixing and metering pump, mix a small amount of injection epoxy, and waste it into a disposable container. The Engineer will observe this trial operation and be satisfied the equipment is working properly, and the epoxy is mixed with no streaks.

CONSTRUCTION DETAILS:
1. **Crack and Surface Preparation.** Remove all debris or contaminants accessible within the cracks by using hand tools, water blasting or oil-free high pressure air blasting, vacuuming, or other methods suitable to the Engineer. Epoxy resin will not penetrate: compacted, water or oil soaked debris. Allow free moisture within the crack to be absorbed before injecting epoxy. Remove all materials, including moisture, from the surface adjacent to the crack which might interfere with bonding of the crack sealant.

2. **Injection Port Installation.** Attach injection ports to the prepared surface by placing them onto (surface adapters) or into the cracks (socket ports) and affixing with crack sealant. Larger cracks may be ported by inserting an anchored tube into the crack.

   Use positive connection port designs to connect injection equipment to the ports. Other injection port designs and attachment methods, where worker fatigue would not be a problem, require approval by the Engineer.

   Use the following general guidelines for spacing injection ports when cracks are uniform in width through the structure. For cracks that get tighter with depth, double this spacing. Intermediate ports may be placed for observation. To permit maximum flow into the void, position ports on the wider crack sections and at intersections, rather than at an exact spacing.

   If these guidelines cannot be followed, use port locations approved by the Engineer. Port spacing may be modified by the Engineer as experience is gained, or when cores are taken to determine penetration.

   **FOR CRACKS COMPLETELY THROUGH A MEMBER**
   
   A. Cracks accessible from one side - space the ports not less than the thickness of the member.

   B. Cracks accessible from both sides - space the ports not less than twice the thickness of the member and stagger them relative to the ports on the opposite side. Make the stagger between ports (on opposite sides of the member) at least the thickness of the member.

   Place the endmost ports at the ends of the crack so as to insure complete filling of the crack.

   **FOR MULTIPLE CRACKS ALL OVER A MEMBER.**
   Space the ports as far apart as practical, but not less than 8” from one another. An 8” spacing presumes a 4” penetration in each direction, if the adjacent ports are not plugged when epoxy reaches them. For fine cracks that taper to an end, place the endmost ports about 4” from the end.

3. **Crack Seal.** After port installation, seal the crack opening with crack sealant, being careful not to plug the injection ports. Allow the crack sealant to cure completely before injecting epoxy.

   Apply crack sealant only when surface and ambient temperatures are above 50º F.
4. **Port Flushing.** Prior to any epoxy injection, flush critical ports with oil-free compressed air to verify that air exits from all the installed ports, dry the cracks, and check for leaks.

5. **Epoxy Injection.** Perform epoxy injection only when the surface and ambient temperatures are above 45º F and are not expected to fall below 45º F during the next 24 hours.

   UNIFORM WIDTH CRACKS - start toward the middle of a horizontal crack and work outward, or the lowest point of a sloping or vertical crack and work upward.

   VARIABLE WIDTH CRACKS - start at the widest points of all types of cracks and work outward. Secure the feed line to the first port. Initiate and continue flow until epoxy exits from the adjacent port. (Plug observation ports and continue through the same port to achieve maximum penetration.) Temporarily stop the injection process, remove the feed line, and seal the port. Attach the feed line to the adjacent port and repeat this procedure along the crack until the last port is sealed.

   Generally, use higher pressures when injecting narrow deep cracks, medium to low for wider cracks, and lowest pressures when injecting a delaminated area or an area susceptible to lifting. Low pressure applied for a longer duration is often more effective than high pressure applied for a shorter duration.

   Replenish the epoxy supply in the mixing equipment before it is exhausted. Thoroughly stir each epoxy component both before and after adding it to its respective component in the mixing equipment. Exercise care to assure a continuous injection operation.

   Allow the epoxy to fully cure prior to performing subsequent work in the repaired area.

   In the event of leakage from a crack, stop the injection process until the leak is sealed. When any work stoppage exceeds 15 minutes, clean the mixing chamber and flush the line that carries mixed epoxy. Flush with a suitable solvent, followed by air.

6. **For ITEM 555.80020001 CRACK REPAIR BY EPOXY INJECTION (RESTORATION),** take cores ranging in diameter from 1 to 4”, as approved by the Engineer, to verify full penetration by epoxy and its cure. Take a representative core from each structural element, or one from every 100 feet of crack repaired, whichever is greater, at locations approved by the Engineer. The Engineer will retain the cores and determine if they are acceptable for payment. Patch the holes with Vertical & Overhead Patching Material.

   More than one core may be necessary to obtain an acceptable sample from cracks that diverge below the surface. (To avoid cutting reinforcing, the core drill may be angled to intercept a crack behind the reinforcing.)

7. **Clean Up.** In all areas visible to the public, as determined by the Engineer, remove spillage, the ports and crack sealant until flush with the adjacent surface. Remove stains and repair any damage to the satisfaction of the Engineer at no additional cost.
ITEM 555.80010001 - CRACK SEALING BY EPOXY INJECTION (PREVENTION)
ITEM 555.80020001 - CRACK REPAIR BY EPOXY INJECTION (RESTORATION)

**METHOD OF MEASUREMENT:** The Engineer will measure the work as the number of linear feet of crack sealed or repaired, as specified.

**BASIS OF PAYMENT:** Include the cost of all labor, materials, and equipment necessary to complete the work in the unit price bid per linear foot. For ITEM 555.80020001 CRACK REPAIR BY EPOXY INJECTION (RESTORATION), also include the cost of coring and repairing the core holes.

For ITEM 555.80010001 CRACK SEALING BY EPOXY INJECTION (PREVENTION), the Engineer will authorize payment after the measured length of crack has been sealed and the surface cleaned.

For ITEM 555.80020001 CRACK REPAIR BY EPOXY INJECTION (RESTORATION), the Engineer will authorize payment after the measured length of crack has been repaired as verified by cores, the core holes patched and the surface cleaned.
DESCRIPTION

Furnish and place precast concrete deck, precast concrete approach slab and integral precast concrete barrier with ultra high performance concrete (UHPC) joints and (UHPC) haunches. The maturity method shall be used to estimate the in-place UHPC strength. The time required before removal of the forms and loading of the structure will be determined based on the estimated in-place UHPC strength. “Panels” refers to both the concrete deck and to the approach slab.

Precast Concrete Deck and Approach Slab Shall be Type 01 Friction.

MATERIALS

PRECAST CONCRETE PANELS: Materials used in this work shall conform to the NYSDOT Prestressed Concrete Construction Manual (PCCM)-Current Edition and the following:

STEEL EMBEDMENTS. Steel embedments for the panel leveling devices and hold down devices shall be installed in the shop based upon the locations shown on the shop drawings.
Leveling Bolts.................................................. ASTM F568M, Class 4.6

CONCRETE
28 Day Compressive Strength 5000 psi (Minimum)
Lifting Strength 3000 psi (Minimum)
Stainless Steel Reinforcing Bars Fy = 75 ksi (709-13)
Mechanical Connectors 709-10
Water §712-01
Aggregates (Friction Type) 501-202.B

PRECAST CONCRETE APPROACH SLAB
The supplier must demonstrate a system to place the approach slab using a grout bed such that the approach slab is fully supported at the proper line and grade.

INTEGRAL PRECAST CONCRETE BARRIER: The requirements of the PCCM and the following shall apply.

Tolerances:
1) Bar Reinforcement Cover -0, + ½ inch
2) Width of Unit at the top -0, + ¼ inch
3) Width of Unit at the bottom -0, + ½ inch
4) Surface deviation from theoretical centerline ½ inch in 20 feet
5) Vertical Alignment (deviation from a line parallel to theoretical grade) ½ inch in 20 feet
6) Horizontal and Vertical Alignment (between adjacent units) 3/16 inch
JOINT, LINK SLAB, CLOSURE POUR AND HAUNCH MATERIAL UHPC: The material shall be Ultra High Performance Concrete, all components supplied by one manufacturer. Materials commonly used in UHPC are:

- Fine aggregate
- Cementitious material
- Super plasticizer
- Accelerator
- Steel Fibers

UHPC material shall meet the following, 28 days unless otherwise noted:

**Minimum Compressive Strength (ASTM C39)**

- High Heat-Treated*: ≥ 25 ksi
- Medium Heat-Treated 12 hours**: ≥ 12 ksi
- Not Heat-Treated 14 days***: ≥ 21 ksi

**Prism Flexural Tensile toughness (ASTM C1018; 12 in. span)**: $I_0 \geq 48$

**Long-Term Shrinkage (ASTM C157; initial reading after set)**: ≤ 766 microstrain

**Chloride Ion Penetrability (ASTM C1202)**: ≤ 250 coulombs

**Chloride Ion Penetrability (AASHTO T259; ½ in. depth)**: < 0.07 oz/ft³

**Scaling Resistance (ASTM C672)**: $y < 3$

**Abrasion Resistance (ASTM C944 2x weight; ground surface)**: < 0.025 oz. lost

**Freeze-Thaw Resistance (ASTM C666A; 600 cycles)**: RDM > 96%

**Alkali-Silica Reaction (ASTM C1260; tested for 28 days)**: Innocuous

* High Heat-Treated - According to manufacturer’s recommendation, temperature not to exceed 250°F.
** Medium Heat Treated temperatures not to exceed 120°F
*** Not Heat Treated temperature not to exceed 70°F

Results of all the tests above, conducted by an AASHTO accredited testing lab shall be submitted to the DCES along with the installation drawings. Provide to the DCES a list of bridge projects in which the proposed UHPC material has been used as joint fill between precast concrete elements (within or outside the USA). The DCES reserves the right to reject a proposed UHPC material which lacks a proven track record in precast concrete joint filling in bridge applications.

**Storage:** The contractor shall assure the proper storage of premix, fibers and additives as required by the supplier's specifications in order to protect materials against loss of physical and mechanical properties.

**Acceptance Testing:** Note: acceptance testing will be waived if the same material from the same supplier has already been tested according to this standard. The Contractor shall complete the testing of the UHPC a minimum of one month before placement of the joint. The testing sequence will include the submission of a plan for casting and testing procedures to the DCES for review and approval followed by casting and testing according to the approved plan.

Casting and testing must include the following:

A minimum of 12 cylinders 3in. x 6 in. shall be cast.

The temperature during curing shall be as per heat treatment temperature limits established in this specification. 2 cylinders shall be tested each testing interval. Testing intervals are at 10 hours, 12 hours, 14 hours, and 24 hours. The compressive strength shall be measured by ASTM C39. Only a concrete mix design that passes these tests may be used to form the joint.
Pullout Test: Cast 6 additional cylinders 12 in. diameter and 7.5 in. deep. Each cylinder shall have one 32 in. long epoxy-coated reinforcing bar cast in the center of the circular face. The axis of the bar shall be perpendicular to the formed surface. 3 of the bars shall be #6 bars embedded 5 in. deep and 3 of the bars shall be #4 bars embedded 3 in. deep. These cylinders will be kept wet for four days then delivered to the Materials Bureau for testing according to Test Method No. NY701-14 E. Contact the Materials Bureau prior to casting for specific instructions on preparing the test specimens. The test will be performed as soon as practical after the corresponding compressive strength samples reach 12 ksi. Acceptance criteria for pullout testing shall be when there is complete tensile failure of the reinforcing bar, prior to pullout from the concrete or failure of the concrete.

EQUIPMENT FOR MATURITY TESTING:

Use a Maturity Meter and thermocouples that can:
- Provide a maturity value based on the Equivalent Age or Temperature Time Method as detailed in ASTM C 1074-11.
- Continuously log and store maturity data.
- Accurate to within +/- 1º F when the meter is calibrated as per the manufacturer’s instructions.
- Take readings every half hour for the first 48 hours and every hour after that at a minimum.
- Print data and/or download it into a spreadsheet.

METHODOLOGY FOR MATURITY TESTING:

The procedure for utilizing the maturity method to determine in-place UHPC strengths includes three steps: development of the strength-maturity relationship, monitoring the maturity of the placement, and regular validation of the strength maturity relationship. Any changes in the mix design, its components, or proportions will require that a new strength-maturity relationship be developed. The strength-maturity relationship shall be developed one month prior to construction. Continue data collection for the strength-maturity relationship after acceptance of the maturity value until the strength reaches 21 ksi.

A procedure to develop the strength-maturity relationship shall be submitted to the DCES for review and approval along with the shop drawings. The submitted procedure shall include all necessary information for the development of the strength maturity relationship. All necessary testing included in the procedure shall be conducted by an AAHSTO accredited testing lab.

CONSTRUCTION

DRAWINGS FOR PRECAST CONCRETE PANELS AND BARRIER

Shop drawings and installation drawings shall be prepared and submitted as per the requirements of the Prestressed Concrete Construction Manual, (PCCM), and the following:

The submitted drawings shall include details of lifting and handling of panels in the production facility and their storage, transportation, handling and storage at the construction site. Lifting holes will not be permitted. The proposed handling and lifting shall be such that the maximum tensile stress in concrete due to handling and erection loads shall not exceed 0.40 \( (f'ci)^{1/2} \), where \( f'ci \) is the concrete compressive strength at the time being considered. Calculations showing actual concrete stresses based upon the
proposed support locations and expected dynamic loading of the panels during handling, storage and transportation of the panels shall be prepared by a Professional Engineer and shall be submitted along with the drawings. These drawings and calculations shall be stamped and signed by a Professional Engineer.

Integral precast concrete barrier shall be cast integrally with the precast concrete deck prior to shipping. Proposed procedures for the casting, handling, and shipping shall be included in the drawings for the precast concrete panels.

The proposed method of mixing, placing, and curing the UHPC joints shall be shown on the installation drawings. The Contractor shall perform qualification testing using maturity method and the results shall be shown on the installation drawing to demonstrate that the proposed method of curing will achieve the required strength at the required time.

**FABRICATION OF PRECAST CONCRETE PANELS**

Fabrication shall meet the requirements of the PCCM and the following:

**Fabrication Tolerances**

1. Width (transverse direction of the bridge): +1/8, -1/8 in.
2. Length (longitudinal direction of the bridge): +1/8, -1/8 in.
3. Depth (overall): +1/8, -0 in.
4. Bulkhead alignment (deviation from square or designated skew)
   - Vertical ¼ in.
   - Horizontal ¼ in.
5. Horizontal alignment (deviation from straight line parallel to centerline of unit):
   - ¼ in. for 40 ft length
   - 3/8 in. for 40 ft to 60 ft length
   - 1/2 in. for greater than 60 ft length

Welding of steel shall comply with the requirements of the New York State Steel Construction Manual.

**Placing Concrete, Curing and Finishing**

All requirements stipulated in PCCM shall apply except for the following:

After curing, all form release material and all other forming material adhering to the shear keyway and block out concrete shall be removed. Shear key faces shall be roughened and blast cleaned.

**Shipping and Handling of Precast Panels and Precast Concrete Barrier.** Shall be as per approved drawings.

**Loading of Panels.** Equipment weighing more than 2500 pounds shall not be permitted on the precast units between the initial set of the UHPC and the time the UHPC has reached a minimum strength of 10 ksi.

**Mixing and Placing UHPC Joints, Link Slab & UHPC Haunches.** Specifications in the PCCM and the following: Thoroughly and continuously wet the concrete contact area for 24 hours prior the placing of UHPC, keep wet and remove all surface water just prior to UHPC placement.
Installation Requirements for Deck Slabs

Installation shall meet the requirements of the PCCM and the following:

1. Prior to installing panels, the supporting steel surfaces in contact with the panels or field placed concrete shall be cleaned, including removal of free water, to the satisfaction of the engineer.

2. Installation tolerances shall be as per the approved installation drawings. It is the responsibility of the contractor to develop appropriate controls during the fabrication and installation of the panels so that proper cross slopes and grades are achieved after the diamond grinding operation. Installation drawing shall show the details of the proposed controls.

Wearing Surface Preparation
The wearing surface shall be diamond ground.

Diamond Grinding
Use equipment having gang-mounted diamond saw blades on a multi-blade arbor specifically designed for PCC pavement production grinding. Using equipment capable of producing a 3 foot (minimum) grinding pass width that is equipped with a vacuum system capable of removing slurry from the bridge deck surface, such as the Target 3800, Boart-Longyear (Kushion Kut) PC 5000 or PC600, or equal as approved by the Director, Materials Bureau. Contractor shall submit requests to use other equipment at 7 days prior to the start of grinding operations.

Installation Requirements for Approach Slabs
Bed and level slabs in accordance with the system designer’s instructions such that the vertical differential across any joint is ¼ in. or less. Slabs shall be placed on grade and have grout pumped underneath to ensure that they are completely supported.

Installation Requirements for UHPC
The contractor shall arrange for a representative of the UHPC supplier to be on site during the placement of the joints until the Contractor’s own staff has become well-trained in the use of the material. The representative shall be knowledgeable in the supply, mixing, delivery, placement, and curing of the UHPC material.

UHPC Haunches
Shall meet the requirements of the PCCM, except that the requirement related to post-tensioning shall not apply. Details of the ports, vents, method of pumping the UHPC, equipment with necessary back up shall be shown on the installation drawing. Required QC shall be listed on the drawings.

Pre-Installation Meeting:
Convene a preplacement meeting 7 to 14 calendar days before the planned start of slab installation. The contractor shall arrange for an on site meeting with representatives from the UHPC and the precast system suppliers. The contractor's staff and the NYSDOT Engineer and Inspectors shall attend the site meeting. The objective of the meeting will be to clearly outline the procedures for placing and leveling the precast concrete panels and for mixing, transporting, finishing and curing of the UHPC material.

Form Work, Batching and Curing
The design and fabrication of forms shall follow approved installation drawings and shall follow the recommendations of the manufacturer. All the forms for UHPC shall be constructed from plywood or approved equal. The forms shall be coated to prevent absorption of water using a form release agent from the Department’s Approved List of Materials.
The contractor shall follow the batching sequence as specified by the supplier and approved by the DCES.

The surface of the UHPC joints shall be filled to plus 1/4 inch above the adjoined surfaces.

The surface of the UHPC field joints shall be filled as shown on the approved drawings.

The UHPC in the form shall be cured according to Manufacturer’s recommendations to attain the required strength shown on the contract documents.

**Quality Control**

The contractor shall measure the slump flow on each batch of UHPC. The slump flow will be conducted using a mini-slump cone. The flow for each batch shall be between 7 in. and 10 in. The slump flow for each batch shall be recorded in the QA/QC log. A copy of the log shall be given to the Engineer.

**Estimation of In-Place Strength:**

1. Two thermocouples per each UHPC joints, one at each end, shall be installed. The locations of these installations shall be shown on the installation drawings. These locations shall be revised if directed by the DCES. The thermocouple wiring may be connected to reinforcing steel, but probe endings may not be in direct contact with the steel. Consider structural or exposure conditions when placing thermocouples.

2. Listed actions are allowed when the maturity value of all the thermocouples reaches the corresponding strength values listed below.

<table>
<thead>
<tr>
<th>Action</th>
<th>Strength Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of top forms</td>
<td>10 ksi</td>
</tr>
<tr>
<td>Open Bridge deck to Traffic</td>
<td>12 ksi</td>
</tr>
</tbody>
</table>

3. Record and save the maturity data from the meter until the strength reaches 21 ksi. Disconnect the meter and clip all wires flush with the concrete surface.

A continuous read thermocouple or thermistor with a data logger can be used to estimate in place strength. The methodology outlined in ASTM C 1074-11 will be used. The maturity function used to estimate strength will be calculated with the same formula that is used by the maturity meter that established the initial strength maturity relationship. Copies of the calculations will be provided to the engineer.

**Validation of the Strength-Maturity Relationship:**

For each day of placement, perform validation tests by casting 7 cylinders. Equip one of the cylinders with a thermocouple. Test the cylinders as close as possible to the maturity value corresponding to 21 ksi. Record the maturity value immediately prior to testing. All testing shall be conducted by an AASHTO accredited testing lab. Report the results to the DCES.

If the average value of compressive strength of each pair of cylinders is within 10% of the estimated value, the strength-maturity relationship will be validated. If the average cylinder value is more than 10% below the estimated value, the strength maturity relationship will need to be re-established. If the first four cylinders produce acceptable results, the remainder need not be tested.

The Department may perform additional testing for research purposes. Casting and testing in addition to...
ITEM 557.64010103 - PRECAST CONCRETE DECK
ITEM 557.64030103 - PRECAST CONCRETE APPROACH SLAB
ITEM 557.11010003 - INTEGRAL PRECAST CONCRETE BARRIER

that required in this spec will be performed by NYSDOT personnel.

In case of loss of required data, or non verification of the strength-maturity relationship, use the cylinders cast above, one pair at a time, to verify the strength.

METHOD OF MEASUREMENT. For precast concrete bridge decks and precast concrete approach slabs apply all the provisions of §557-4. For precast concrete bridge barrier apply all the provisions of §569-4.

BASIS OF PAYMENT. For precast concrete bridge decks and precast concrete approach slabs apply all the provisions of §557-5. For precast concrete bridge barrier apply all the provisions of §569-5.
ITEM 557.51XX0018 - INTERNAL CURING CONCRETE FOR SUPERSTRUCTURE SLABS WITH INTEGRAL WEARING SURFACE - BOTTOM FORMWORK REQUIRED - TYPE XX FRICTION

ITEM 557.52XX0018 - INTERNAL CURING CONCRETE FOR SUPERSTRUCTURE SLABS WITH INTEGRAL WEARING SURFACE - BOTTOM FORMWORK NOT REQUIRED - TYPE XX FRICTION

ITEM 557.54XX0018 - INTERNAL CURING CONCRETE FOR STRUCTURAL APPROACH SLAB WITH INTEGRAL WEARING SURFACE - TYPE XX FRICTION

ITEM 557.550000018 - INTERNAL CURING CONCRETE FOR SIDEWALKS AND SAFETY WALKS

DESCRIPTION
Furnish and place reinforcing steel and Internal Curing (IC) concrete to construct superstructure slabs as shown in the contract plans. Internal Curing concrete is a modified Class HP concrete with lightweight fine aggregate substituted for a portion of the standard fine aggregate to aid the curing process internally.

MATERIALS
Manufacture Class HP concrete modified for internal curing according to §501, and the following modifications:

1. The slump range is 4-7 inches. High Range Water-Reducing Admixtures (§711-08, ASTM Type F), are permitted.

2. The maximum w/c ratio is 0.40. Do not include absorbed moisture of the lightweight fine aggregate as part of the w/c ratio calculation.

3. Substitute lightweight fine aggregate, meeting the requirements of AASHTO M 195, for 30% (by volume) of standard fine aggregate.

The Regional Materials Engineer, or his representative, will approve the batch weights prior to use. Use these values to manufacture all internally cured high performance concrete and periodically correct the batch weights to account for changes in the fine aggregate fineness modulus and aggregate moisture contents.

CONSTRUCTION DETAILS
Apply the provisions of §557-3 and the following modifications:

1. Add the following to §557-3.01, Concrete Manufacturing and Transporting:
   a. Construct lightweight fine aggregate stockpile(s) at the production facility so as to maintain uniform moisture throughout the pile. Using a sprinkler system approved by the Materials Engineer. Continuously and uniformly sprinkle the stockpile(s) with water for a minimum of 48 hours, or until the “Absorbed Moisture content” of the aggregate in the stockpile is at least 15% by weight as determined by Test Method NY 703-19E (https://www.dot.ny.gov/divisions/engineering/technical-services/materials-bureau/forms-manuals). If a steady rain of comparable intensity occurs, turn off the sprinkler system at the direction of the Materials Engineer, until the rain ceases. At the end of the wetting period, or after the rain ceases, allow stockpiles to drain for 12 to 15 hours immediately prior to use, unless otherwise directed by the Materials Engineer.

   b. The moisture content of the lightweight fine aggregate must be determined immediately prior to batching, using Test Method NY 703-19E. If the supplied mix design is based on “oven dry” weight of lightweight fine aggregate, a
corresponding adjusted weight must be supplied to account for the actual absorbed moisture content, so that the mix design entered into the automated batching system is based on SSD weight. After the adjusted mix design is entered into batching system, additional adjustments must be made to the fine aggregate and water quantities to account for the “surface” moisture of the fine aggregates.

c. The lightweight fine aggregate, at the time of batching must be at least 15% absorbed moisture content. Batch the lightweight fine aggregate first, then routinely batch the fine aggregate, coarse aggregate, admixtures, cement, pozzolan, Microsilica, and remaining mixing water and mix completely.

d. Have the lightweight aggregate manufacturer supply a service representative at the site for the first two days of concrete placement operations to assist in the control of IC concrete mixing and placement operations.

2. Make any repairs as per the provisions of §557-3.16, Damaged or Defective Concrete.

3. The loading limitations of §557-3.14 apply.

**METHOD OF MEASUREMENT**
Apply all the provisions of §557-4.

**BASIS OF PAYMENT**
Apply all the provisions of §557-5.

XX = Friction Type
  01 - Type 1 Friction
  02 - Type 2 Friction
  03 - Type 3 Friction
  09 - Type 9 Friction
ITEM 565.64nnnn16 - BASE ISOLATION BEARING SYSTEMS

DESCRIPTION

This work shall consist of furnishing, and installing base isolation bearings of the type required, at the locations indicated on the plans.

MATERIALS

General
Material shall meet the requirements of the Appendix - Base Isolation Bearing Systems Materials (beginning page 4 of 12).

Fabrication
The systems shall be complete, factory-produced assemblies. Steel components of bridge bearings shall be fabricated in accordance with the applicable requirements of the NYS Steel Construction Manual (SCM). In addition, where applicable, component parts of the individual bearings shall meet the Fabrication details shown in the contract documents.

Submittals
At the time of the preconstruction conference the Contractor is required to identify his/her intended isolation system supplier and to provide DCES with a certification of compliance listing all materials in the system. The certificate shall certify that the system conforms to the design and material requirements.

Submittals shall also include:

1. Product literature, including product description, reference standards and performance test data.
2. A detailed description of maintenance requirements, including sources of replacement materials.

DCES will notify Contractor of approval/disapproval within 30 days from date of submittal. Submittals with insufficient test data and supportive certifications will be rejected.

System & Drawing Requirements
Shop drawings will be required for all bearings. They shall be furnished in accordance with the SCM, Section 2. The Contractor shall supply two copies of the approved shop drawings to the Materials Bureau. These will be used to implement the quality assurance process.

The contract plans contain the design requirements and are supplied as a means of specifying the required performance characteristics for the isolation system.

Calculations showing system compliance with all relevant provisions of the current AASHTO Guide Specifications for Seismic Isolation Design shall be submitted to DCES along with the shop drawing submittals for review and approval.

The bearing devices shall be capable of transmitting the maximum vertical and seismic lateral load demand shown on the plans in accordance with the AASHTO Guide Specifications for
ITEM 565.64 - BASE ISOLATION BEARING SYSTEMS
Seismic Isolation Design. The longitudinal and transverse force and the transverse displacement demands shown on the plans are the maxima of the lateral service loads to be used for service load design of isolators. Other conditions may control substructure design.

SHIPMENT AND STORAGE
Each bearing shall be assembled together with all necessary plates at the place of manufacture. Each bearing shall be shipped in strong protective packaging as an assembled unit. Assembly shall be such that the assembled bearing remains intact when unpackaged and installed. All bearings shall be stored under cover, in their original packaging, above ground, until installation.

CONSTRUCTION DETAILS
The following applicable subsections of Section 565 shall apply: 565-3.02 ; 565-3.03; 565-3.04 ; 565-3.06 ; 565-3.07; 565-3.08.

In addition the following shall apply:

A. The elevation of the concrete bearing surface for all types of bearings is given on the plans. The elevation of the concrete bearing surface may vary from that given on the plans depending on the vertical dimension of the bearing supplied. The Contractor shall notify the Engineer of all required elevation changes. Changes to the roadway profile will not be allowed, and all elevation adjustments necessary to maintain the profile shall be made to the concrete bearing surfaces. All adjustments will be made at no additional cost to the State.

B. The centerline of the bearing shall not be offset from the centerline of bearing stiffeners, or diaphragm connection plates by more than one-half the thickness of the flange at that location, or the thickness of the bearing stiffener, or connection plate, whichever is the lesser distance.

C. Bearings shall be installed only when ambient temperature is within the temperature range of 20°F to 70°F inclusive, unless otherwise shown on the contract plans.

D. Bearings may vary from perfect vertical alignment. The maximum variation from perfect vertical alignment under full dead load shall not exceed 0.125" in any direction. The variation will be measured as the horizontal distance between the centerline of the highest bearing surface and the centerline of the lowest bearing surface.

E. All bearings shall be installed level. All grade corrections shall be accomplished by means of beveled shim plates.

F. After bearing installation has been completed, the contractor
ITEM 565.64nnnn16 - BASE ISOLATION BEARING SYSTEMS

shall ensure that each bearing is free to deform horizontally in all
directions and is free to rotate about all axes, unless otherwise indicated
on the contract plans.

METHOD OF MEASUREMENT
Measurement will be taken as each bearing furnished and installed as required.

BASIS OF PAYMENT
Base Isolation Bearing systems, furnished and installed, as specified, will be paid for at the
contract unit price for each Base Isolation Bearing of the type designated. Such price shall
include all costs associated with the design of the bearings, shop drawings, testing and all work
incidentals to and associated with the furnishing and installation of the bearings as specified
herein. The unit bid price for each bearing shall include the cost of all labor, materials and
equipment necessary to complete the work.

Progress Payments
The requirements of subsection 565-5.01 shall apply.

NOTE: nn denotes serialized pay item. See § 101-02.
SCOPE. This specification covers the material requirements for base isolation bearing systems. Bearings furnished under this specification shall adequately provide for thermal expansion and contraction, rotation, camber changes, creep, shrinkage and seismic stresses of structural members, where applicable.

GENERAL. All bearings fabricated under the terms of this subsection shall perform the functions for which they have been designed.

Stresses will be computed in accordance with the requirements of the AASHTO GUIDE SPECIFICATION FOR SEISMIC ISOLATION DESIGN.

MATERIAL REQUIREMENTS. Bearings fabricated under the requirements of this specification, except as modified by the terms of this subsection, shall meet the applicable requirements of subsections 716.

All materials shall be new. No used or reclaimed material will be permitted.

Elastomeric Material The elastomeric structural/rotational element shall be polyether urethane in accordance with Table 716-06-1 or virgin polyisoprene (natural rubber) meeting or exceeding ASTM D4014, Type NR, Gr. 3 (except as modified below):

(a) Low Temperature Properties
   ASTM D2137 Method A (Brittleness Test at -13°F): no failure ASTM D 1229 (Compression Set at 14°F for 7 days at 25% compression)
   Maximum permissible set: 65%
   ASTM D2240 (Low Temperature Stiffness Conditioned for 22 hours at 13°F)
   Maximum permissible change in durometer hardness: + 10 Shore 'A' points

(b) Tensile Strength and Ultimate Elongation of Elastomer:
   Minimum tensile strength and ultimate elongation tests will be performed according to ASTM D412. The minimum tensile strength will be 2,250 psi and the minimum ultimate elongation will be 550%.

(c) Hardness of Elastomer: The durometer hardness will be determined by ASTM D2240 and will be 55 ± 5 Shore 'A' points.

(d) Shear Modulus at 50% Shear Strain of Elastomer: The shear modulus of the elastomer at 50% shear strain will be determined by ASTM D4014. The tangent modulus will be 100 psi ± 10%.

Lead. This shall meet the requirements of ASTM B29, Common Lead and shall have a minimum lead purity of 99%.
Steel All external plates, regardless of purpose, shall meet the requirements of ASTM A36, A 572- Gr. 50, or A588 as noted on the plans. All fabrication shall be done in accordance with the applicable requirements of the SCM.

Fasteners These shall meet the requirements of the SCM unless otherwise noted on the plans.

Protective Coating External load bearing plates shall be cleaned to meet SSPC-SP6, Surface Preparation Specification No. 6 Commercial Blast Cleaning and painted with three coats of paint. The paint (primer, intermediate and finish coat) shall be selected from NYSDOT’s Approved List, Paints for Structural Steel. All coats of paint used shall be produced by the same manufacturer and applied at a rate sufficient to produce a minimum dry film thickness of 75 µm (3 mils) per coat. Each single paint coat shall be a color different from the others. For bearings used in conjunction with painted steel the color of the finish coat shall be the same color as the finish coat of the structural steel. For bearings used in conjunction with unpainted steel the color of the finish coat shall be a "rusty brown" color which is a reasonable visual match to Federal Color Standard No. 595, Color 20059.

Metal to metal surfaces to be field welded shall be given a coat of clear lacquer or other protective coating approved by the Engineer, or Inspector, if exposure is to exceed three months prior to welding. The coating shall be removed prior to welding. Painting shall be done after the completion of welding.

Fabrication tolerances

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Plan Dimension</td>
<td>± 0.25 in</td>
</tr>
<tr>
<td>Flateness of Exterior Top Surface to Completed Bearing</td>
<td>± 0.01 in</td>
</tr>
<tr>
<td>Flateness of Exterior Bottom Surface to Completed Bearing</td>
<td>± 0.06 in</td>
</tr>
<tr>
<td>Variation from Plan Parallel to the Theoretical Surface:</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>Slope relative to the bottom no more than 0.006 radians</td>
</tr>
<tr>
<td>Sides</td>
<td>± 0.25 in</td>
</tr>
<tr>
<td>Overall Bearing Height</td>
<td>± 0.25 in</td>
</tr>
</tbody>
</table>
Bearings not meeting the above dimensional requirements shall be subject to rejection.

**Testing** The overall objective of this testing is to evaluate the actual performance of the bearing system in accordance with the contract documents. The contractor shall allow a minimum of 30 days for testing and inspection of the bearings.

The Manufacturer shall arrange to test each bearing type with such test witnessed and attested to by a NYSDOT representative designated by the DCES for compliance with specified performance requirements as listed herein. Testing shall be performed at a test facility with the ability to record data and test vertical load, horizontal load, and horizontal displacement simultaneously. Load and displacement measuring equipment shall be calibrated traceable to NIST. The NYSDOT representative shall be notified of the scheduled tests 14 days prior to the testing. NYSDOT shall have free access to the testing area.

Except where otherwise specified, two bearing assemblies shall be tested for each lot. A lot shall be defined as the lot designation stated in the applicable item 716-06 or 716-07. These bearings shall be selected at random, by the NYSDOT representative, from the lot of production bearings. The chosen bearings are to be tested to the applicable design forces and displacements for that bearing. The test values for each bearing are to be taken from the tables in the contract plans.

<table>
<thead>
<tr>
<th>Test</th>
<th>Performed By</th>
<th>Samples Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Aging</td>
<td>Manufacturer</td>
<td>Pre-qualified if test has been performed on similar bearing within 10 yr period.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Previous data to be submitted)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OTHERWISE</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 production bearings per lot</td>
</tr>
<tr>
<td>Temperature Testing</td>
<td>Manufacturer</td>
<td>Pre-qualified if test has been performed on similar bearing within 10 yr period.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Previous data to be submitted)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OTHERWISE</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 production bearings per lot</td>
</tr>
<tr>
<td>Proof Test</td>
<td>Manufacturer</td>
<td>2 production bearings per lot</td>
</tr>
<tr>
<td>Combined Compression plus</td>
<td>Manufacturer</td>
<td>2 production bearings per lot</td>
</tr>
<tr>
<td>Lateral Load Testing</td>
<td>Manufacturer</td>
<td>2 production bearings per lot</td>
</tr>
<tr>
<td>Dynamic Performance</td>
<td>Manufacturer</td>
<td>Pre-qualified if test has been performed on similar bearing within 10 yr period.</td>
</tr>
<tr>
<td>Characteristics at Temperature Extremes</td>
<td></td>
<td>(Previous data to be submitted)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OTHERWISE</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 production bearings per lot</td>
</tr>
<tr>
<td>Compression Strain</td>
<td>Manufacturer</td>
<td>3 production bearings per lot</td>
</tr>
</tbody>
</table>
NOTES:

1. Sample production bearings of such size that cannot be tested by the manufacturer at 150% design capacity for rotation shall be tested at actual design capacity. Bearings which are tested at actual design capacity will be tested at that capacity because it is not possible, or not practical to test them at a higher capacity. Therefore, bearings tested at 150% design capacity which are rejected, will not be retested below 150% design capacity for the purpose of rendering such bearings acceptable. Sample production bearings that cannot be tested by the manufacturer at their actual design capacity for rotation and/or friction shall be tested by an outside laboratory. The Manufacturer shall assume the cost of this testing and submit the certified test results to the Materials Bureau.

2. All submitted sample sheets of polyether urethane material shall be certified by the bearing manufacturer as having been taken from the same batch of polyether urethane material as was used in the actual production bearings.

3. The manufacturer shall have the option of supplying four (4) die cut specimens in accordance with ASTM D-395, Method B. All submitted specimens of polyether urethane material shall be certified by the bearing manufacturer as having been taken from the same batch of polyether urethane material as was used in the actual production bearings.

4. Single sheets of PTFE Material from which the bearing has been fabricated may be submitted to the Materials Bureau for consideration of multiple lot acceptance, provided that the thickness of the material does not vary from lot to lot. All submitted sample sheets shall be certified by the bearing manufacturer as having been taken from the same batch of PTFE material as was used in the actual production bearings.

At the completion of the tests, each bearing shall be inspected by the NY representative, and all damaged components shall be replaced with new components made from the same batch of material as that used in the production lot. If the bearings meet the test criteria, the tested bearings may be refurbished to their pre-tested condition and used in the completed structure.

Each bearing selected for testing will be performance characteristic tested in accordance with the applicable requirements of the above subsections as well as the following:

1. Environmental Aging

   Purpose: To verify performance of the bearing type in a salt spray environment such as may be encountered over a long period of time under an expansion deck joint which is subject to salting.

   Procedure: A bearing assembly shall be exposed in a salt spray chamber for 1000 hours in accordance with the requirements of ASTM B117. The bearing
ITEM 565.640100NI - BASE ISOLATION BEARING SYSTEMS

APPENDIX-BASE ISOLATION BEARING SYSTEMS MATERIALS

subjected to this test shall then undergo other testing to verify continued satisfactory function.

2. Temperature Testing

Purpose: Establish dependence on temperature.

Sequence: Three fully reversed cycles to peak design displacements ($d_{\text{max}}$) under seismic loading. Tests shall be conducted for temperatures at the start of cyclic loading corresponding to 0°F and 90°F. Tests shall be conducted with a vertical load equal to the total dead load.

Procedure: Place the salt spray bearing in an environmental chamber; maintain the temperature to within ± 5°F of that specified for a period of 24 hours for 90°F, and 24 hours for 0°F. After conditioning the bearing for the required time, place the bearing in the test machine and secure it to the supports and loading plate. Apply a vertical load equal to the total dead load to the bearing and allow the load to stabilize. Apply the cyclic lateral load equal to peak design displacements ($d_{\text{max}}$) to the bearing for 3 fully reversed cycles. The test shall be run continuously without pause between cycles.

Criteria: The system, unit or component response is considered to be independent of temperature if:

( a ) The average Effective stiffnesses measured at temperature 0°F is within 20% of the average effective stiffness measured at a temperature of 90°F.

( b ) The average Energy Dissipation per cycle measured at temperature 0°F is within 20% of the average Energy Dissipation per cycle measured at a temperature of 90°F.

3. Proof Test

Two bearing assemblies from each lot of production bearings shall be proof tested. The sampled bearings shall be axially loaded with simultaneous rotation for one hour in accordance with the Rotation testing specified in 716-06 and/or 716-07. The bearings shall be visually examined during and after the test. The structural/rotational load element shall not exhibit cracks greater than 2 millimeters (0.08 inches) in depth, or width.
4. Combined Compression Plus Shear
Two bearing assemblies from each lot of production bearings shall be tested in combined compression and shear. The requirements of the AASHTO GUIDE SPECIFICATIONS FOR SEISMIC ISOLATION DESIGN, Section 17.2.2 shall apply. The compressive load shall be the average dead load. Bearings may be tested in pairs.

Each tested bearing will be evaluated for the following performance requirements:

(a) The effective stiffness \( (k_{eff}) \) shall be within the range of \( \pm 10\% \) of the required value (Figure 1).
(b) The slope of the loading curve \( (K_u) \) shall be equal to, or greater than, \( 90\% \) of the required value (Figure 1).
(c) The average value of energy dissipated per cycle (EDC) shall be equal to or greater than the required value (Figure 1).

Values for the above noted force-deflection characteristics are given in the contract plans.

5. Lateral Load Testing
Two bearing assemblies from each lot of production bearings shall be tested in accordance with the seismic testing requirements of the AASHTO GUIDE SPECIFICATIONS FOR SEISMIC ISOLATION DESIGN.

The test results shall be within tolerances set forth in Section 13. The vertical load applied to the bearing during this testing shall be the average dead load.

Failure of an isolation bearing device is defined as when:

(a) The elastomeric material visually tears; or,
(b) The sliding materials crack; or,
(c) There is a sudden unexpected increase/decrease in stiffness; or,
(d) A significant change in performance occurs.

6. Dynamic Performance Characteristics at Temperature Extremes

Purpose: To assess the effects of extreme temperature on the performance characteristics, specifically stiffness, damping, and EDC.
Procedure: With the full dead load applied (for load bearing isolators), three fully reversed cycles of the design displacement are applied at the upper and lower temperature extremes. The temperature range of interest for this project is from -30°F to 120°F. Further test procedures for handling hot or cold test articles are as follows:

1. The test article and mounting hardware is placed in the heating/cooling unit for 48 hours.
2. The test article and mounting hardware is installed in the test rig within 75 minutes after being removed from the thermal chamber; and,
3. Testing is performed within five minutes after installation is complete.

Criteria: The bearing is considered acceptable if:

a. The variation in stiffness from ambient temperature (68°F) to extremes (-30°F and 120°F) shall not exceed 30%.

b. The variation in EDC from ambient temperature (68°F) to extremes (30°F and 120°F) shall not exceed 15%.

Documentation

The bearing manufacturer shall submit certified test results to the DCES that indicate all tested bearings and/or bearing components meet the following requirements of this specification

<table>
<thead>
<tr>
<th>Specification Requirement</th>
<th>Proof Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyurethane Properties</td>
<td>Combined Compression plus shear Lateral Load Testing</td>
</tr>
<tr>
<td>Proof Test</td>
<td>Dynamic Performance Characteristics at Temperature Extremes</td>
</tr>
<tr>
<td>Combined Compression plus Shear Test</td>
<td></td>
</tr>
<tr>
<td>Lateral Load Test</td>
<td></td>
</tr>
<tr>
<td>Environmental Aging Test</td>
<td></td>
</tr>
<tr>
<td>Temperature Tests</td>
<td></td>
</tr>
</tbody>
</table>

Bearing Testing Frequency:

- Test
- Environmental Aging
- Temperature Testing
ITEM 565.640100NI - BASE ISOLATION BEARING SYSTEMS

APPENDIX-BASE ISOLATION BEARING SYSTEMS MATERIALS

<table>
<thead>
<tr>
<th>Material</th>
<th>Number of Bearings Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elastomer</td>
<td>1 Previous Aged Bearing</td>
</tr>
<tr>
<td>Bearing</td>
<td>1 Previous Aged Bearing</td>
</tr>
<tr>
<td>Bearing</td>
<td>2 per lot</td>
</tr>
<tr>
<td>Bearing</td>
<td>2 per lot</td>
</tr>
<tr>
<td>Previous Bearing</td>
<td>2 per lot</td>
</tr>
<tr>
<td>Previous Bearing</td>
<td>1 Previous Aged Bearing</td>
</tr>
</tbody>
</table>

Number of Bearings Tested

This test is performed on two bearing assemblies from each lot of unaged production bearings, as well as previous testing completed on one Environmentally Aged Bearing. In addition, certification shall be provided to the DCES for the following:

1. Mill conformance certificate for all steels used.
2. Certificate of compliance for all non-ferrous metals.
3. Certificate of compliance for all bolts and cap screws supplied.
4. A certificate of compliance for the bearings executed by an officer of the manufacturer’s company.

If a bearing manufacturer has not completed Environmental Aging testing on a similar bearing design, or their submitted testing documentation is found to be unacceptable by the Materials Bureau, the bearing manufacturer shall complete the 42 day Environmental Aging tests in addition to all other required bearing testing.

If a bearing manufacturer has not completed Dynamic Performance Characteristics at Temperature Extremes testing on a similar bearing design, or their submitted testing documentation is found to be unacceptable by the Materials Bureau, the bearing manufacturer shall complete the Dynamic Performance Characteristics at Temperature Extremes test in addition to all other required bearing testing.

BASIS OF ACCEPTANCE. Bearings will be approved for shipment to the project site at the manufacturing facility, in project lot quantities, or portions thereof, in accordance with the procedural directives of the Materials Bureau. The manufacturer shall be responsible for the final report to be reviewed and accepted by an independent engineer or agency approved by the design engineer or consultant for final acceptance. The independent engineer or agency shall have sufficient experience in seismic analysis of structures and design.
ITEM 565.640100NI - BASE ISOLATION BEARING SYSTEMS
APPENDIX-BASE ISOLATION BEARING SYSTEMS MATERIALS

FIGURE 1
An idealized force - displacement (hysteretic) loop of an isolation bearing
ITEM 611.19010024 - POST-PLANTING CARE WITH REPLACEMENT - MAJOR DECIDUOUS TREES
ITEM 611.19020024 - POST-PLANTING CARE WITH REPLACEMENT - MINOR DECIDUOUS TREES
ITEM 611.19030024 - POST-PLANTING CARE WITH REPLACEMENT - CONIFEROUS TREES
ITEM 611.19040024 - POST-PLANTING CARE WITH REPLACEMENT - DECIDUOUS SHRUBS
ITEM 611.19050024 - POST-PLANTING CARE WITH REPLACEMENT - EVERGREEN SHRUBS
ITEM 611.19060024 - POST-PLANTING CARE WITH REPLACEMENT – VINES, GROUNDCOVERS
ITEM 611.19070024 - POST-PLANTING CARE WITH REPLACEMENT - HERBACEOUS PLANTS

DESCRIPTION

This work consists of the care of newly planted and transplanted trees, shrubs, vines, groundcovers and other plants and replacement of plants in kind and as necessary, in accordance with the contract documents and as directed by the Engineer.

MATERIALS

Materials shall meet the requirements of the following subsections of Section 700 Materials and Manufacturing.

- Water 712-01
- Topsoil 713-01
- Mulch for Landscape Bedding 713-05
- Trees, Shrubs and Vines 713-06
- Materials for the Protection of Plants 713-08
- Pesticides 713-13

CONSTRUCTION

Post-Planting Care. The Contractor shall perform all work as specified under Standard Specification section 611-3.05 Post-Planting Care.

Replacement Planting. Plants that die, become diseased or badly impaired during Post-Planting Care shall be removed and replaced in kind once with new, healthy plant material, in the same location as the initial planting. Replacement planting shall occur within the planting seasons shown in Standard Specification Table 611-1. For any plants replaced during the Post-Planting Care period, Post-Planting Care shall continue to the end of the period.

Replacement plants shall be planted, maintained and accepted per Standard Specification Section 611-3.01. Planting soil used in the initial planting shall be reused for replacement plants and shall be supplemented with topsoil at no additional cost if additional material is needed to meet grade and surface finish. Watering shall accompany backfilling, at no additional cost. No replacement tree shall be staked, guyed or anchored.
ITEM 611.19010024 - POST-PLANTING CARE WITH REPLACEMENT - MAJOR DECIDUOUS TREES
ITEM 611.19020024 - POST-PLANTING CARE WITH REPLACEMENT - MINOR DECIDUOUS TREES
ITEM 611.19030024 - POST-PLANTING CARE WITH REPLACEMENT - CONIFEROUS TREES
ITEM 611.19040024 - POST-PLANTING CARE WITH REPLACEMENT - DECIDUOUS SHRUBS
ITEM 611.19050024 - POST-PLANTING CARE WITH REPLACEMENT - EVERGREEN SHRUBS
ITEM 611.19060024 - POST-PLANTING CARE WITH REPLACEMENT – VINES, GROUNDCOVERS
ITEM 611.19070024 - POST-PLANTING CARE WITH REPLACEMENT - HERBACEOUS PLANTS

METHOD OF MEASUREMENT.

The quantity to be measured for payment will be the number of plants of each type cared for and, if necessary, replaced in kind.

BASIS OF PAYMENT.

The unit price bid shall include the cost of all labor, materials, and equipment necessary to satisfactorily complete the work.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>611.19010024</td>
<td>Post Planting Care with Replacement - Major Deciduous Trees</td>
<td>Each</td>
</tr>
<tr>
<td>611.19020024</td>
<td>Post Planting Care with Replacement - Minor Deciduous Trees</td>
<td>Each</td>
</tr>
<tr>
<td>611.19030024</td>
<td>Post Planting Care with Replacement - Coniferous Trees</td>
<td>Each</td>
</tr>
<tr>
<td>611.19040024</td>
<td>Post Planting Care with Replacement - Deciduous Shrubs</td>
<td>Each</td>
</tr>
<tr>
<td>611.19050024</td>
<td>Post Planting Care with Replacement - Evergreen Shrubs</td>
<td>Each</td>
</tr>
<tr>
<td>611.19060024</td>
<td>Post Planting Care with Replacement– Vines, Groundcovers</td>
<td>Each</td>
</tr>
<tr>
<td>611.19070024</td>
<td>Post Planting Care with Replacement - Herbaceous Plants</td>
<td>Each</td>
</tr>
</tbody>
</table>
ITEM 619.22970011 - TRAFFIC ENFORCEMENT AGENTS

DESCRIPTION

Under the item, professionally trained Traffic Enforcement Agents (TEAs) from the Police Department shall be provided in order to properly maintain the flow of traffic in the vicinity of the construction site, as specified in the contract documents and as determined and ordered by the Engineer. A boiler plate of formal agreement, as developed during the design phase of the project in consultation with the NYPD shall be executed by the Contractor as a final agreement with the Traffic Control Division/Office of Construction Mitigation and Coordination-Streets (OCMC) following the award of the contract, as provided in the special provisions.

MATERIALS

The contractor shall arrange for TEAs to be provided by the NYPD with a uniform readily identifiable to the traveling public. Each TEA will be equipped with all items, to be provided by NYPD, necessary to carry out their assigned duties.

CONSTRUCTION DETAILS

The TEAs will be deployed to provide adequate traffic control throughout the construction site. The location, hours and days to be worked by the TEAs shall be according to contract plans or as evaluated and determined by the Engineer in Charge before the start of the contract.

METHOD OF MEASUREMENT

The dollars-cents sum shown in the bid proposal for this item shall be considered the price bid including equipment & uniform cost although actual payment will be based on the work performed. The dollars-cents sum is not to be altered in any manner.

It is agreed that all work shall be based on the actual number of hours that each TEA performs at a post in addition to travel time. Travel time will not exceed two hours per day. For every four TEAs on duty there shall be one relief TEA. Relief TEAs are required to provide coverage for regularly posted TEAs during their staggered lunch or dinner period and breaks. They shall be paid for actual relief hours at the same rate as the agents they are relieving that day. Total estimated costs shall include the actual cost of fringe/leave benefits for each TEA and Supervisor.

The hours of supervisory personnel will be based on a percentage basis of man-hours worked by TEAs including travel time. Supervision will consist of level I, level II, and level III supervisors. Payment will be made based on work as follows: level I at 12.5%, level II at 2.5%, and level III at 1.33% of all hours worked by TEAs. Supervisory personnel hours are not subject to audit.

The hourly rate paid shall be the actual yearly salary, divided by the normal hours paid, including leave and holiday hours for TEAs. Those TEAs working overtime, including
ITEM 619.22970011 - TRAFFIC ENFORCEMENT AGENTS

weekends and holidays will be paid one and a half times their regularly hourly rate. Those TEAs starting work prior to 8:00AM and/or working beyond 6:00PM shall be entitled to a 10% night shift differential. An additional 5% of the total hours (TEA man hours worked including travel time and supervision hours) will be allowed for bookkeeping services in processing TEA time sheets.

BASIS OF PAYMENT

The contract price for this item shall be a dollars-cents price for the work performed under this item and shall be equal to the sum total of all vouchers submitted to the Contractor by the New York City Police Department (NYPD), as approved by the Engineer, for payment by the Contractor for the cost incurred in providing Traffic Enforcement Agents. Each TEA will be required on a daily basis to sign a time sheet showing date, time and the hours worked at each assigned location. These time sheets along with the report which shall contain the name of the agent, badge number and in-out will be submitted to the Engineer, on a daily basis, for verification. Payment under this item, will not be made until the Contractor has furnished satisfactory evidence (check etc.) to the Engineer that he has reimbursed the Police Department for said costs in providing Traffic Enforcement Agents.

The total estimated cost of this item is the “dollars-cents” amount shown for this item in the Bid Schedule. No guarantee is given that the actual dollars-cents cost for this item will in fact be the “dollars-cents” amount. The “dollars-cents” amount is included in the total bid solely to insure that sufficient monies will be available to pay the Contractor for these services.

The Contractor shall maintain separate books of accounts and shall not charge any portion of the cost of Traffic Enforcement services to another part of the work.

The voucher for the payment shall be submitted to the Engineer for approval on a monthly basis and shall include the signed copies of the daily summary time sheet.

Payment for this item shall be on a monthly basis upon submission of voucher to be verified by the Engineer. Payment to NYPD shall be prompt & should be treated separately from the payment made to subcontractors.

The “dollars-cents” is for bidding purposes only and shall not be varied in the bid. The contractor will be paid for the actual amount paid to NYPD and a 5% overhead as an administrative fee regardless of the dollars-cents, which may be more or less than the dollars-cents amount.
DESCRIPTION
This work shall consist of furnishing, installing, maintaining, and removing PRIMARY PROTECTIVE SHIELDS in accordance with the contract documents and as directed by the Engineer.

MATERIALS
Lumber shall meet the requirements of Material Specification 712-14. Fasteners such as screws, bolts, nuts, and washers shall meet or exceed the standard industrial fastener specification for the intended application.

Used materials will be allowed, except materials that are permanently attached to the structure, which shall be in conformance with the current New York State Department of Transportation Standard Specifications.

Contractor shall be allowed to use materials other than lumber after obtaining prior approval the Engineer-in-Charge (EIC). Dimensions and stresses shall be as specified in the design of the shield.

CONSTRUCTION DETAILS
Contract plans show no-drop areas to be protected by the Protective Shield. Components of the shielding system, such as support members, may extend beyond the limits shown, but no component may extend into the secondary protective shielding.

The shielding system shall be suspended from the existing steel on the outbound side of the stringers. This shielding system shall be designed for a loading capacity shown on the contract plans.

The Contractor shall engage the services of a New York State Licensed Professional Engineer to design and detail the primary protective shield to be used at each location shown on the plans. He shall be available for consultation in interpreting his plans and in the resolution of problems, which may arise during the performance of the work.

All design and details shall be in conformance with the current New York State Department of Transportation Standard Specifications for Highway Bridges and the current New York State Steel Construction Manual, and AASHTO requirements.

The shielding used shall have no seam or void. The adjoining sheetings, if needed, shall have enough lap length and shall be secured by welds, screws or bolts to sustain the design loadings.

The Contractor shall furnish working drawings prepared, stamped and signed by a New York State License Professional Engineer for the protective shield to be used at each location shown on the plans. The drawings shall include, but not be limited to, the following:

1. Anticipated dead and live loads based on the work to be performed above the shield.
2. Details of all components and connections.
3. Type and grade of all materials.
Six legible, standard size (22 x 36 inches nominal, 21 x 33½ inches working area) prints of each drawing, together with three copies of all design computations shall be submitted to the Deputy Chief Engineer (Structures) for approval. Failure to submit drawings of the required size will be cause for their return without examination.

The Deputy Chief Engineer (Structures) shall be allowed the longest of the following time durations to examine design computations and working drawings:

1. Ten working days.
2. Two working days for each drawing of a set of working drawings.
3. One working day for every four (4) design computation sheets.
   Any design computation sheet written on both sides will be considered as two design computation sheets.

All items for examination shall begin upon receipt of all pertinent information by the Deputy Chief Engineer (Structures).

The Deputy Chief Engineer’s (Structures) comments shall be indicated on the returned copies. Should the proposed system not be approved, the reasons shall be indicated with the return of the material. The Contractor shall then submit revised drawings for approval, subject to the same terms as the first submission. Resubmission shall not be considered a legitimate reason to request an extension of time under subsection 108-04, Extension of Time.

All work shall be done in accordance with the approved working drawings. The Contractor must have approved working drawings prior to the start of shield installation.

The Contractor shall bear all costs and/or damages which may result from the ordering of any material, or equipment; or the use of any preparatory labor prior to the approval of the working drawings.

All materials required for the primary protective shield shall remain the property of the Contractor and shall be removed from the site after the work is completed, unless otherwise agree to.

**METHOD OF MEASUREMENT**

This work will be measured as the number of square feet (plan area) of PRIMARY PROTECTIVE SHIELDS satisfactorily furnished, installed, maintained, and removed.

**BASIS OF PAYMENT**

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.
DESCRIPTION
This work shall consist of furnishing, installing, maintaining, and removing SECONDARY PROTECTIVE SHIELDS in accordance with the contract documents and as directed by the Engineer. This shielding shall be set as a secondary protection, installed underneath the primary shielding system. This secondary shielding shall have a suspended support system independent of the primary protective shield supports.

MATERIALS
This shielding, which is a secondary debris shield, shall be of flexible corrugated structural steel. The material for shielding shall meet the requirements of AASHTO M167, and Material Specification 707. The Contractor shall determine the thickness and shape of the plate upon the design and field conditions.

Fasteners such as screws, bolts, nuts, and washers shall meet or exceed the standard industrial fastener specification for the intended application.

Used materials will be allowed, except materials that are permanently attached to the structure, which shall be in conformance with the current New York State Department of Transportation Standard Specifications.

Dimensions and stresses shall be as specified in the design of the shield.

CONSTRUCTION DETAILS
The plans show no-drop areas to be protected by the Protective Shield. Components of the shielding system, such as support members, may extend beyond the limits shown, but no component may extend into the theoretical passageway required by vehicles below the bridge.

The shielding system shall be suspended from the existing steel on the outbound side of the stringers. This shielding system shall be designed for a loading capacity shown on the contract plans.

The Contractor shall engage the services of a New York State Licensed Professional Engineer to design and detail the protective shield to be used at each location shown on the plans. He shall be available for consultation in interpreting his plans and in the resolution of problems, which may arise during the performance of the work.

All design and details shall be in conformance with the current New York State Department of Transportation Standard Specifications for Highway Bridges and the current New York State Steel Construction Manual, and AASHTO requirements.

The shielding used shall have no seam or void. The adjoining sheetings, if needed, shall have enough lap length and shall be secured by welds, screws or bolts to sustain the design loadings.

The Contractor shall furnish working drawings prepared, stamped and signed by a New York State License Professional Engineer for the protective shield to be used at each location shown on the plans. The drawings shall include, but not be limited to, the following:
1. Anticipated dead and live loads based on the work to be performed above the shield.
2. Details of all components and connections.
3. Type and grade of all materials.

Six legible, standard size (22 x 36 inches nominal, 21 x 33½ inches working area) prints of each drawing, together with three copies of all design computations shall be submitted to the Deputy Chief Engineer (Structures) for approval. Failure to submit drawings of the required size will be cause for their return without examination.

The Deputy Chief Engineer (Structures) shall be allowed the longest of the following time durations to examine design computations and working drawings:

1. Ten working days.
2. Two working days for each drawing of a set of working drawings.
3. One working day for every four (4) design computation sheets.
   Any design computation sheet written on both sides will be considered as two design computation sheets.

All items for examination shall begin upon receipt of all pertinent information by the Deputy Chief Engineer (Structures).

The Deputy Chief Engineer’s (Structures) comments shall be indicated on the returned copies. Should the proposed system not be approved, the reasons shall be indicated with the return of the material. The Contractor shall then submit revised drawings for approval, subject to the same terms as the first submission. Resubmission shall not be considered a legitimate reason to request an extension of time under subsection 108-04, Extension of Time.

All work shall be done in accordance with the approved working drawings. The Contractor must have approved working drawings prior to the start of shield installation.

The Contractor shall bear all costs and/or damages which may result from the ordering of any material, or equipment; or the use of any preparatory labor prior to the approval of the working drawings.

All materials required for the protective shield shall remain the property of the Contractor and shall be removed from the site after the work is completed, unless otherwise agree to.

**METHOD OF MEASUREMENT**
This work will be measured as the number of square feet (plan area) of SECONDARY PROTECTIVE SHIELDS satisfactorily furnished, installed, maintained, and removed.

**BASIS OF PAYMENT**
The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.
ITEM 637.31XX0020 – INSPECTION VEHICLES (MAXIMUM BID)

DESCRIPTION
This work shall consist of providing and maintaining motor vehicle(s) for exclusive use by the Engineer and the Inspection Staff.

MATERIALS
The vehicles(s) provided shall not be over 4 years old or have over 50,000 miles on the odometer as of the delivery date. The vehicle(s) shall be properly registered and be provided with an owner’s policy of liability insurance in conformance with §107-06B. Insurance Requirements. The vehicles shall be in safe and serviceable operating condition with automatic transmissions and air conditioning.

A. Compact Sedan. The Contractor shall provide a Ford Focus or similar compact sedan.

B. Midsize/Intermediate SUV. The Contractor shall provide a Jeep Patriot or similar midsize/intermediate SUV. The SUV shall have all-wheel, or 4-wheel drive capability.

C. Small/Standard Pickup Truck. The Contractor shall provide a Chevrolet Colorado or similar small/standard pickup truck. The pickup truck shall have 4-wheel drive capability.

CONSTRUCTION DETAILS
Prior to the start of any contract work, the Contractor shall make the inspection vehicle(s) available for inspection by the Engineer. The Contractor shall make arrangements for delivery to the site on a date agreed to by the Engineer. If more than one vehicle is required, the number required will be shown in a Special Note entitled Contractor Supplied Inspection Vehicles.

Inspection vehicles will be operated by Department and consultant inspection staff possessing a valid driver’s license as authorized by the Engineer and for official State business purposes only. The vehicle operator is personally liable for any traffic infractions, including parking tickets, or EZ Pass violations.

The Contractor shall provide all proper and scheduled maintenance (oil changes, tires) to keep the vehicle(s) in safe and serviceable operating condition and undertake all repairs as required, including repairs arising from vandalism, accidents or other damages. If a vehicle becomes unavailable for any reason or requires maintenance or repairs which cannot be completed on the same day, a comparable replacement vehicle shall be provided while the vehicle is out of service. The Department will provide fuel and EZ Pass for the vehicle(s).

METHOD OF MEASUREMENT
Each inspection vehicle will be measured for payment on a monthly basis, measured to the nearest 0.25 months.

BASIS OF PAYMENT
The unit price bid per month shall include all costs in connection with furnishing properly registered vehicle(s), maintaining and repairing the vehicles as required and providing an owner’s policy of liability insurance for the vehicles in conformance with §107-06B. Insurance Requirements. A deduction of 1/30 of a month will be made for each 24-hour period, or portion thereof, during which the vehicle is unavailable to the Engineer, regardless of the reason for the vehicle's unavailability. Payment may be terminated on a specified date prior to contract final acceptance by written notification from the Engineer that a vehicle will no longer be required.
ITEM 637.31XX0020 – INSPECTION VEHICLES (MAXIMUM BID)

Payment will be made under:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>637.31010020</td>
<td>Inspection Vehicles, Compact Sedan</td>
<td>Month</td>
</tr>
<tr>
<td>637.31020020</td>
<td>Inspection Vehicles, Midsize/Intermediate SUV</td>
<td>Month</td>
</tr>
<tr>
<td>637.31030020</td>
<td>Inspection Vehicles, Small/Standard Pickup Truck</td>
<td>Month</td>
</tr>
</tbody>
</table>

MAXIMUM BID ITEM
The maximum bid allowed per vehicle(s) per month shall be that shown in the proposal. The Contractor may bid less than the maximum bid, but any bid exceeding the maximum bid will be disregarded and changed to the amount shown in the proposal.
ITEM 800.01000015 – DESIGN BUILD – DESIGN SERVICES

DESCRIPTION. This work shall consist of providing design services in accordance with the contract documents.

MATERIALS. None Specified.

CONSTRUCTION DETAILS. The Design Builder shall provide Design Services by the appropriately qualified and licensed personnel in accordance with the requirements in the contract documents.

METHOD OF MEASUREMENT. Design Build - Design Services will be measured for payment on a lump sum basis.

BASIS OF PAYMENT. The lump sum price bid for Design Build - Design Services shall include the cost of furnishing all labor, equipment and incidentals to satisfactorily complete the work. Progress payments will be made in accordance with the contract documents.
DESCRIPTION. This work shall consist of providing design services in accordance with the contract documents.

MATERIALS. None Specified.

CONSTRUCTION DETAILS. The Design Builder shall provide Design Services by the appropriately qualified and licensed personnel in accordance with the requirements in the contract documents.

METHOD OF MEASUREMENT. Design Build - Design Services will be measured for payment on a lump sum basis.

BASIS OF PAYMENT. The lump sum price bid for Design Build - Design Services shall include the cost of furnishing all labor, equipment and incidentals to satisfactorily complete the work. Progress payments will be made in accordance with the contract documents.
ITEM 800.02000015 – DESIGN BUILD – CONSTRUCTION INSPECTION SERVICES

**DESCRIPTION.** This work shall consist of providing Construction Inspection Services in accordance with the contract documents.

**MATERIALS.** None Specified.

**CONSTRUCTION DETAILS.** The Design Builder shall provide Construction Inspection Services by the appropriately qualified and licensed personnel in accordance with the requirements in the contract documents.

**METHOD OF MEASUREMENT.** Design Build - Construction Inspection Services will be measured for payment on a lump sum basis.

**BASIS OF PAYMENT.** The lump sum price bid for Design Build - Construction Inspection Services shall include the cost of furnishing all labor, equipment and incidentals to satisfactorily complete the work. Progress payments will be made in accordance with the contract documents.
DESCRIPTION. This work shall consist of providing Construction Inspection Services in accordance with the contract documents.

MATERIALS. None Specified.

CONSTRUCTION DETAILS. The Design Builder shall provide Construction Inspection Services by the appropriately qualified and licensed personnel in accordance with the requirements in the contract documents.

METHOD OF MEASUREMENT. Design Build - Construction Inspection Services will be measured for payment on a lump sum basis.

BASIS OF PAYMENT. The lump sum price bid for Design Build - Construction Inspection Services shall include the cost of furnishing all labor, equipment and incidentals to satisfactorily complete the work. Progress payments will be made in accordance with the contract documents.
IDENTIFICATION. This work shall consist of providing Quality Control Services in accordance with the contract documents.

MATERIALS. None Specified.

CONSTRUCTION DETAILS. The Design Builder shall provide Quality Control Services by the appropriately qualified and licensed personnel in accordance with the requirements in the contract documents.

METHOD OF MEASUREMENT. Design Build - Quality Control Services will be measured for payment on a lump sum basis.

BASIS OF PAYMENT. The lump sum price bid for Design Build - Quality Control Services shall include the cost of furnishing all labor, equipment and incidentals to satisfactorily complete the work. Progress payments will be made in accordance with the contract documents.
DESCRIPTION. This work shall consist of providing Quality Control Services in accordance with the contract documents.

MATERIALS. None Specified.

CONSTRUCTION DETAILS. The Design Builder shall provide Quality Control Services by the appropriately qualified and licensed personnel in accordance with the requirements in the contract documents.

METHOD OF MEASUREMENT. Design Build - Quality Control Services will be measured for payment on a lump sum basis.

BASIS OF PAYMENT. The lump sum price bid for Design Build - Quality Control Services shall include the cost of furnishing all labor, equipment and incidentals to satisfactorily complete the work. Progress payments will be made in accordance with the contract documents.
ITEM 800.04000015 – DESIGN BUILD – FORCE ACCOUNT WORK

DESCRIPTION. This work shall consist of performing construction work in accordance with the contract documents and as directed by the Engineer.

MATERIALS. None Specified.

CONSTRUCTION DETAILS. The Design Builder shall perform construction work in accordance with the contract documents as directed by the Engineer. The Design Builder will maintain and provide agreed price or force account records to document the costs in accordance with DB section 109-9.

METHOD OF MEASUREMENT. Design Build – Force Account Work will be measured for payment on a Dollar Cents basis.

BASIS OF PAYMENT. The price shown for Design Build - Force Account Work shall include the cost of furnishing all labor, materials, equipment and incidentals to satisfactorily complete the work. The total cost shown in the itemized proposal will be considered the price bid even though payment will be made only for actual work performed. The unit price amount is not to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figure will be disregarded, and the original price will be used to determine the total amount bid for the contract.

Progress payments will be made in accordance with the contract documents.
ITEM 800.05000015 – DESIGN BUILD – SITE MOBILIZATION

DESCRIPTION. This work shall consist of providing necessary bonds, insurance, prefinancing and set up of necessary general plant, including shops, storage areas, office and such sanitary and other facilities as are required by local or state law or regulation.

MATERIALS. None Specified.

CONSTRUCTION DETAILS. The Design Builder shall provide the above facilities and service for mobilization in a safe and workmanlike manner in conformance with any pertinent local or State Law, regulation or code to the extent and at the time the Contractor deems them necessary for its operations. Good housekeeping shall be maintained.

METHOD OF MEASUREMENT. Design Build – Site Mobilization will be measured for payment on a lump sum basis.

BASIS OF PAYMENT. The lump sum price bid for Design Build – Site Mobilization shall not exceed four percent (4%) of the total contract bid price for all Construction Work items. Should the bidder exceed the foregoing four percent (4%), the Department will make the necessary adjustment to determine the total amount bid based on the arithmetically correct proposal.

Progress payments in the amount of 4% of the construction work items will be made to the Contractor with the first contract payment made for other contract work at the individual itemized work site.
ITEM 800.0600NN15 – DESIGN BUILD – CONSTRUCTION WORK

DESCRIPTION. This work shall consist of construction work in accordance with the contract documents.

MATERIALS. None Specified.

CONSTRUCTION DETAILS. The Design Builder shall perform all construction work in accordance with the requirements in the contract documents.

METHOD OF MEASUREMENT. Design Build – Construction Work will be measured for payment on a lump sum basis for each location. The individual locations are identified in the contract documents.

BASIS OF PAYMENT. The lump sum price bid for Design Build – Construction Work shall include the cost of furnishing all labor, materials, equipment, management and supervision to satisfactorily complete the work. Progress payments will be made for each construction work location in accordance with the contract documents.

Note: NN in pay item number denotes serialization by location.
ITEM 800.06XXNN15 – DESIGN BUILD – CONSTRUCTION WORK – STRUCTURAL REPAIRS

DESCRIPTION. This work shall consist of structural repair work in accordance with the contract documents and as directed by the Engineer.

MATERIALS. None Specified.

CONSTRUCTION DETAILS. The Design Builder shall perform all structural repair work in accordance with the requirements in the contract documents.

For the “unanticipated repairs” items of work, the Design Builder will maintain and provide agreed price or force account records to document the costs in accordance with DB section 109-9.

METHOD OF MEASUREMENT. Design Build – Construction Work – Structural Repairs will be measured for payment on either a lump sum or Dollars-Cents basis.

BASIS OF PAYMENT.

Steel Superstructure Repair Work – directive repairs - The lump sum price bid shall include the cost of furnishing all labor, materials, equipment, management and supervision to satisfactorily complete the work. Progress payments will be made for each construction work location in accordance with the contract documents.

Steel Superstructure Repair Work – unanticipated repairs - The price shown shall include the cost of furnishing all labor, materials, equipment and incidentals to satisfactorily complete the work, and additional necessary subcontractor work in accordance with DB 109-9.2.2, including but not limited to engineering and quality control. The total cost shown in the itemized proposal will be considered the price bid even though payment will be made only for actual work performed.

Concrete Substructure Repair Work – directive repairs - The lump sum price bid shall include the cost of furnishing all labor, materials, equipment, management and supervision to satisfactorily complete the work. Progress payments will be made for each construction work location in accordance with the contract documents.

Concrete Substructure Repair Work – unanticipated repairs - The price shown shall include the cost of furnishing all labor, materials, equipment and incidentals to satisfactorily complete the work, and additional necessary subcontractor work in accordance with DB 109-9.2.2, including but not limited to engineering and quality control. The total cost shown in the itemized proposal will be considered the price bid even though payment will be made only for actual work performed.

Progress payments will be made for each construction work location in accordance with the contract documents.
Payment will be made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>800.0601NN15</td>
<td>Steel Superstructure Repair Work – directive repairs</td>
<td>Lump Sum</td>
</tr>
<tr>
<td>800.06020015</td>
<td>Steel Superstructure Repair Work – unanticipated repairs</td>
<td>Dollars-Cents</td>
</tr>
<tr>
<td>800.0606NN15</td>
<td>Concrete Substructure Repair Work – directive repairs</td>
<td>Lump Sum</td>
</tr>
<tr>
<td>800.06070015</td>
<td>Concrete Substructure Repair Work– unanticipated repairs</td>
<td>Dollars-Cents</td>
</tr>
</tbody>
</table>

Note: NN in pay item number denotes serialization by location.