BRUCKNER VIADUCT DECK REPLACEMENTS

PIN X731.45, Contract D900040

DB CONTRACT DOCUMENTS PART 8

SPECIAL SPECIFICATIONS

Final July 26, 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 Design-Builder shall use the NYSDOT Standard Specifications Construction Materials in coordination with *Part 5 – Special Provisions*.

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:

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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 555.81000018 - STRUCTURAL CRACK SEALING

DESCRIPTION

Seal non-critical cracks (about 1/16 to 3/8 inches in width) in portland cement concrete (abutments, piers, walls, etc.) by blast cleaning and injecting a silicone sealant into the dry crack. Perform the work at locations indicated on the Contract Plans or where ordered by the Engineer.

MATERIAL REQUIREMENTS

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CONSTRUCTION DETAILS

Clean the crack surface, and as deep into the crack as practical with water or abrasive blasting, to provide a clean, dry surface for bonding of the sealant.

If the crack is wet, allow the crack area to dry, or use oil-free air to blow the surfaces of the crack dry. Wait an additional drying day before injecting the sealant. If contamination occurs, repeat the cleaning and drying process.

Use a one component (hand-held cartridge type or similar) toolable sealant, color matched to the concrete, whose brand name appears on the Approved List. Inject the sealant into the dry crack to a minimum depth equal to the crack width, strike off flush with the adjacent surface, and clean up any excess.

Perform the work when the ambient air temperature is 40°F or greater.

METHOD OF MEASUREMENT

The work will be measured as the number of linear feet of crack sealed.

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.
ITEM  557.21020016 - FIELD CAST JOINTS BETWEEN PRECAST CONCRETE UNITS

SCOPE
This specification covers field casting of joints for precast concrete units, including batching, transportation, casting and curing.

MATERIAL

High Weight Methyl Methacrylate (used as repair for leaking joint)
The high molecular weight methacrylate (HMWM) resin shall be low viscosity and non-fuming. Acceptance is based on the manufacturer certifying that it conforms to the following, and the contractor forwarding the certification to the DCES:

- Viscosity Less than 25 cps when measured according to ASTM D2849
- Density Greater than 8.4 lb/gal. @ 77º F.
- Flash Point Greater than 200º F.
- Vapor Pressure Less than 1.0 mm Hg @ 77º F. (ASTM D 323)
- TG (DSC) Greater than 136º F (ASTM D3418)
- Gel Time Greater than 40 minutes for a 100 gram mass
- Percent Solids Greater than 90 % by weight
- Bond Strength Greater than 1522.3 psi (ASTM C882)

Sand The sand shall be commercial quality dry blast sand. 95% of the sand shall pass the #8 sieve, and 95% shall be retained on the #30 sieve.

The container shall include the following information: The name of the manufacturer, the brand name of the product, the date of manufacture.

Water shall meet the requirements of §712-01.

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

- Minimum Compressive Strength (ASTM C39)
  - Heat-Treated* ≥ 25 ksi
  - Not Heat-Treated** ≥ 20 ksi
  - Not Heat-Treated 3 day** ≥ 12 ksi
- Prism Flexural Tensile toughness (ASTM C1018; 10 in. span) I30 ≥ 48
- Long-Term Shrinkage (ASTM C157; initial reading after set) ≤ 766 microstrain
- Chloride Ion Penetrability (ASTM C1202) ≤ 250 coulombs
- Chloride Ion Penetrability (AASHTO T259; 1/5 in. depth) < 0.07 oz/ft²
- 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

* Heat-Treated - According to manufacturer’s recommendation, temperature not to exceed 250ºF.
** Not Heat-Treated - Cured at a temperature of 50º F ± 3º.

Casting and testing must include the following (The DCES may waive tests if these tests have been previously performed for material supplied by the manufacturer):

A minimum of 12 cylinders 3 in. X 6 in. shall be cast.
All cylinders shall be cured using the same method of curing proposed to be used in the field. The temperature during curing shall be within 18ºF of the low end of the proposed temperature range for curing in the field. 2 cylinders shall be tested each testing day. Testing times are at 4 days, 7 days, 14 days, and 28 days. The compressive strength shall be measured by ASTM C39 and shall meet 12 ksi minimum at 4 days and 21 ksi minimum at 28 days. Only a UHPC mix design that passes these tests may be used to form the joint.

Cast 6 additional cylinders 12 in. diameter and 7 ½ 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 inches deep and 3 of the bars shall be #4 bars embedded 3 inches deep. These cylinders will be kept wet for four days then delivered to the Materials Bureau for testing according to Test Method No. NY 701-14 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 samples reach 12 ksi.

This test is a pullout test. The samples pass if the bars yield without the UHPC failing and without the bars pulling out of the UHPC.

Results of all the tests above, conducted by an AASHTO accredited testing lab shall be submitted to the DCES for review and approval a minimum of 60 days prior to the use of UHPC in the field. 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.

**CONSTRUCTION**

**Pre-Pour Meeting:** Prior to the initial placement of the UHPC, the contractor shall arrange for an on site meeting with the UHPC representative. 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 mixing, transporting, finishing and curing of the UHPC material.

The contractor shall arrange for a representative of the UHPC supplier to be on site during the placement of the joints. The representative shall be knowledgeable in the supply, mixing, delivery, placement, and curing of the UHPC material.

**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.

**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. The forms shall be coated to prevent absorption of water.

The contractor shall follow the batching sequence as specified by the supplier and approved by the DCES. The surface of the UHPC field joints shall be filled to plus 1/8 inch above the surface of the precast panels.
The UHPC in the form shall be cured according to Manufacturer’s recommendations to attain the required strength shown on the contract documents. A continuous curing temperature of a minimum of 60ºF is recommended.

**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 10in. 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.

The contractor shall take four sets of compressive strength test samples for each day of placement. Each set consists of 3 cylinders 3in. X 6in. All sets shall be cured in an environment similar to the material they represent.

The following tests shall be performed:
Compressive strengths shall be according to ASTM C 39. The timing of the testing shall be as required by the contract documents. The second set shall be tested at 28 days. The third set will be sent to the Materials Bureau between the 4th day and the 14th day. The fourth set shall be treated as a reserve set.

**Watertight Integrity Test**
After the joint has reached the required strength, a watertight integrity test shall be performed in accordance with §567-3.01.H. If leakage occurs the Contractor must seal the entire length of the leaking joint using High Weight Methyl Methacrylate at no extra cost to the State.

**Repair**
Abrasive blast clean the area to be treated, removing all contaminants from the surface. Clean adjacent surfaces of the leaking joints using compressed air which is free of oil and moisture.

Do not apply sealers if rain is expected within 12 hours of completion. Apply sealers to clean, dry surfaces when the surface temperature is at least 50º F, and if near 50º F, rising. The sealer shall be mixed and applied according to the manufacturer’s instructions and no more than 5 gallons at a time. Pour the sealer over the joints.

When the methacrylate surface will be used as a driving surface, sand must be applied to provide friction. After the resin has been applied, at least 20 minutes shall elapse before applying the sand. The sand shall be broadcast at a rate of approximately two pounds per square yard, completely covering the sealer.

The sealer must be tack-free before construction traffic is permitted to resume.

**MEASUREMENT FOR PAYMENT**
Measurement will be by volume of UHPC joints placed in cubic feet. The volume of in-place UHPC shall be calculated to the nearest cubic foot.

**BASIS OF PAYMENT**
Payment at the contract price for the above item shall be full compensation for all labor, equipment, and material to do the work.
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 557.55000018 - 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 light weight 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 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.
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:

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<tr>
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<td>Post Planting Care with Replacement - Herbaceous Plants</td>
<td>Each</td>
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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.
ITEM 634.99010017 – BUILDING CONDITION SURVEY
ITEM 634.99020017 – VIBRATION MONITORING (NONBLASTING)

DESCRIPTION

A. Building Condition Survey. This work shall consist of performing a building condition survey(s) and preparing permanent records as indicated in the contract documents prior to the commencement of work, after completion of work, and at locations and times during construction as directed by the Engineer.

B. Vibration Monitoring (Nonblasting). This work shall consist of performing vibration monitoring of background and construction activities and preparing daily and summary report(s) of vibration readings.

MATERIALS

A. Building Condition Survey. Provide general photography and video equipment, analog or digital, capable of superimposing the date and time on all images.

B. Vibration Monitoring (Nonblasting). Provide a 3-component seismograph, capable of measuring particle velocity data in three mutually perpendicular directions. Annual factory calibration is required throughout the duration of the work.

CONSTRUCTION DETAILS

A. General. The Contractor shall engage the services of a firm capable of furnishing a New York State licensed Professional Engineer to conduct a condition survey of the existing building(s) indicated in the contract documents in the Special Note entitled Vibration Criteria and an experienced vibration monitoring Consultant to measure peak particle velocities prior to, and during, construction operations. Submit as proof to the Deputy Chief Engineer Technical Services (DCETS) the experience and qualifications of the firm’s personnel conducting the work.

B. Building Condition Survey. Provide, as a minimum, the following information:

1. Photographic and videotape documentation of the interior and exterior condition of the building(s).
2. Extent and location of existing signs of building distress such as cracks, spalling, signs of settlement, flooding, leaking, etc.

The Engineer may accompany the Contractor on each building condition survey for verification of the data recorded. Provide two copies of all documentation of each building condition survey to the Engineer.

C. Vibration Monitoring (Nonblasting). The DCETS may waive the requirements of vibration monitoring based on the results of the building condition survey.

Perform continuous vibration monitoring during construction operations when adjacent construction activities make monitoring prudent. The Contractor shall perform contract work in
a manner that will limit construction vibration at the specified locations to within the limits set within the contract documents.

1. Submittal of Written Vibration Monitoring Plan. Prior to performing work adjacent to specified locations, a written Vibration Monitoring Plan prepared by the Contractor shall be submitted to the Engineer a minimum of 10 work days in advance for approval. The Engineer will send a copy of the Vibration Monitoring Plan to the Geotechnical Engineering Bureau, Engineering Geology Section, for review and written comment. The vibration monitoring plan may be returned to the Contractor for revision or clarification.

The vibration monitoring plan shall include the necessary information to outline the recording collection. The vibration monitoring plan shall include, but not be limited to, the following items:

a. Contract Designations
   - The name of vibration monitoring specialist(s).
   - The scheduled start date and length of construction operations which require vibration monitoring.
   - The limits of vibration monitoring work, including sites on or off State-owned right-of-way.
   - The location of all structures to be monitored in proximity to the construction operation.
   - The location of any underground utilities in proximity to the construction operation.

b. Experience and Equipment
   - Submit proof and details, as references, of two projects in the past five years where the vibration monitoring consultant performing the work has satisfactorily monitored construction operations by recording maximum peak particle velocities (PPVs). Include contact information for each reference.
   - Submit information on the required 3-component seismograph, capable of measuring particle velocity data in three mutually perpendicular directions, including: the manufacturer’s name, model number, and documentation of factory calibration performed within the last 12 months.

c. Methods and Procedures
   - The location of adjacent structures to be monitored and maximum allowable PPVs as indicated in the contract documents. If not otherwise specified, a maximum allowable PPV in accordance with the United States Bureau of Mines (USBM) Vibration Criteria (Figure 1) shall be observed at all structures.
   - The location of seismograph(s) placements, as directed by the Contractor’s Professional Engineer. Recording seismographs may be installed on selected structures.
   - Appropriate details for anchoring the geophone(s).
- The procedure for tracking PPV throughout construction operations (e.g., Pile Driving Operations: pile tip vs. vibrations may be correlated through time of day. A record of the time of day at each depth interval, included on the pile driving records, would be required to correlate to a time-based readout of PPV).

Figure 1—Safe Vibration Limit Recommendations for Residential Structures

Figure 1 – USBM Vibration Criteria (after Siskind et al, 1980)
The figure provides a “threshold damage” limit, defined as cosmetic damage (e.g., cracking) within the structure, categorized by both frequency ranges and particle velocity.
2. Measuring Vibrations. The Contractor shall inform the Engineer immediately each time measured particle velocities exceed 85% of the allowable peak particle velocity. The Contractor shall make equipment or procedural modifications as required to avoid exceeding the allowable vibration intensity.

If the measured velocities exceed the maximum allowable PPVs, the Contractor shall stop operations immediately and revise equipment and procedures to reduce vibrations to allowable levels.

The Contractor shall be in communication with his monitoring firm’s personnel during vibration monitoring at all locations to verify the data recorded.

The Contractor shall provide the Engineer with the results of daily vibration monitoring, one work day after the readings are taken. Upon completion of the construction operations for those locations requiring vibration monitoring, the daily submittals shall be synthesized into a final report.

If the seismographs show any indication of damage or vandalism, the seismographs shall be immediately recalibrated or replaced.

METHOD OF MEASUREMENT

A. Building Condition Survey. This work will be measured on a lump sum basis.

B. Vibration Monitoring (Nonblasting). This work will be measured on a lump sum basis.

BASIS OF PAYMENT

The unit price bid for building condition survey(s) and vibration monitoring shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

Vibration Monitoring (Nonblasting). Progress payments will be made for this item paid proportionally in accordance with the amount of work completed, measured on a workday basis.

Payment will be made under:

<table>
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<tr>
<th>Item No.</th>
<th>Item</th>
<th>Pay Unit</th>
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<td>Building Condition Survey</td>
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</tr>
<tr>
<td>634.99020017</td>
<td>Vibration Monitoring (Nonblasting)</td>
<td>Lump Sum</td>
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</table>
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>
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<th>Description</th>
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<td>Month</td>
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<tr>
<td>637.31020020</td>
<td>Inspection Vehicles, Midsize/Intermediate SUV</td>
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</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.
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.
ITEM 800.03000015 – DESIGN BUILD – QUALITY CONTROL SERVICES

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 §109-05A. or §109-05B. of the Standard Specifications.

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

BASIS OF PAYMENT. The lump sum price bid 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 – STEEL SUPERSTRUCTURE REPAIRS

DESCRIPTION. This work shall consist of steel superstructure repair work (SSRW) in accordance with the contract documents and as directed by the Engineer.

MATERIALS. None Specified.

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

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

BASIS OF PAYMENT.

SSRW – 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.

SSRW – unanticipated repairs, and SSRW –strap plate (inspection, repair) - The price shown 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.

Payment will be made under:

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<td>Dollars-Cents</td>
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<td>800.06030015</td>
<td>SSRW –strap plate (inspection, repair)</td>
<td>Dollars-Cents</td>
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