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:

ITEM 502.RLCF6011 – PERFORMANCE ENGINEERED MIXTURE – PORTLAND CEMENT CONCRETE PAVEMENT
ITEM 525.X0516111 – DIAMOND GRINDING TO AN IRI VALUE OF 70 INCHES/MILE WITH SLURRY REMOVAL
ITEM 555.80020001 – CRACK REPAIR BY EPOXY INJECTION (RESTORATION)
ITEM 557.25000016 – CRACK SEALING USING HIGH MOLECULAR WEIGHT METHACRYPATE – LINEAR CRACKS
ITEM 557.26000016 – CRACK SEALING USING HIGH MOLECULAR WEIGHT METHACRYPATE – FLOODING
ITEM 559.91100010 – ANTI-GRAFFITI PROTECTIVE COATING
ITEM 603.95XX0011 – DUCTILE IRON PIPE ON CRUSH STONE BEDDING
ITEM 604.020X0011 – CATCH BASIN – TYPES 1-3 (NEW YORK CITY)
ITEM 604.04020011 – NYC STANDARD FOR 4 FOOT DIAMETER PRECAST MANHOLE
ITEM 604.04030011 – NYC STANDARD FOR 5 FOOT DIAMETER PRECAST MANHOLE
ITEM 604.04850011 – NYC STANDARD MANHOLE TYPE A-1
ITEM 604.04860011 – DROP PIPE MANHOLE (NYC)
ITEM 604.04890011 – NYC STANDARD MANHOLE TYPE A-3
ITEM 607.7XXYN39 – STEEL FENCE AND GATE - NYCDPR
ITEM 611.190X0024 – POST PLANTING CARE WITH REPLACEMENT
ITEM 619.22970011 – TRAFFIC ENFORCEMENT AGENTS
ITEM 634.900X0011 – RODENT AND VERMIN CONTROL
ITEM 634.99020017 – VIBRATION MONITORING (NONBLASTING)
ITEM 637.31020020 – INSPECTION VEHICLE, MIDSIZE/INTERMEDIATE SUV
ITEM 637.4000NN20 – WEBCAM SYSTEM
ITEM 655.00XX0011 – CAST FRAME AND GRATES AND MANHOLE COVERS
ITEM 800.01000015 – DESIGN BUILD – DESIGN SERVICES
ITEM 800.02000015 – DESIGN BUILD – CONSTRUCTION INSPECTION SERVICES
ITEM 800.03000015 – DESIGN BUILD – QUALITY CONTROL SERVICES
ITEM 800.04000015 – DESIGN BUILD – FORCE ACCOUNT WORK
ITEM 800.05000015 – DESIGN BUILD – SITE MOBILIZATION
ITEM 800.06000NN15 – DESIGN BUILD – CONSTRUCTION WORK
ITEM 800.1000NN15 – DESIGN BUILD – UTILITY RELATED WORK

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.
502-1 DESCRIPTION
Construct a Portland Cement Concrete (PCC) pavement and shoulders, if required, as described in the Contract Documents, using a Performance Engineered Mixture (PEM).

502 -2 MATERIALS AND EQUIPMENT

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>501</td>
<td>Portland Cement Concrete</td>
<td>501</td>
</tr>
<tr>
<td>701-07</td>
<td>Anchoring Materials - Chemically Curing</td>
<td>701</td>
</tr>
<tr>
<td>705-02</td>
<td>Highway Joint Sealants (ASTM D6690, Type IV)</td>
<td>705</td>
</tr>
<tr>
<td>705-07</td>
<td>Premoulded Resilient Joint Filler</td>
<td>705</td>
</tr>
<tr>
<td>705-10</td>
<td>Preformed Elastic Longitudinal Joint Seal</td>
<td>705</td>
</tr>
<tr>
<td>705-12</td>
<td>Preformed Elastic Transverse Contraction and Expansion Joint Seal</td>
<td>705</td>
</tr>
<tr>
<td>705-13</td>
<td>Lubricant for Preformed Elastic Joint Sealer</td>
<td>705</td>
</tr>
<tr>
<td>705-14</td>
<td>Longitudinal Joint Ties</td>
<td>705</td>
</tr>
<tr>
<td>705-15</td>
<td>Transverse Joint Supports</td>
<td>705</td>
</tr>
<tr>
<td>709-02</td>
<td>Wire Fabric for Concrete Reinforcement</td>
<td>709</td>
</tr>
<tr>
<td>709-04</td>
<td>Epoxy Coated Bar Reinforcement, Grade 60</td>
<td>709</td>
</tr>
<tr>
<td>711-02</td>
<td>Quilted Covers (for curing)</td>
<td>711</td>
</tr>
<tr>
<td>711-03</td>
<td>Plastic Coated Fiber Blankets (for curing)</td>
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<tr>
<td>711-04</td>
<td>Polyethylene Curing Covers (white opaque)</td>
<td>711</td>
</tr>
<tr>
<td>711-05</td>
<td>Membrane Curing Compound</td>
<td>711</td>
</tr>
<tr>
<td>711-07</td>
<td>Form Insulating Materials for Cold Weather Concreting</td>
<td>711</td>
</tr>
<tr>
<td>712-01</td>
<td>Water</td>
<td>712</td>
</tr>
</tbody>
</table>

In addition to meeting the requirements of §701-07, Anchoring Materials - Chemically Curing, the material used to anchor longitudinal joint ties, dowels, or other miscellaneous items into hardened concrete must be a pourable, two-component, 100% solids structural epoxy dispensed:
- From side-by-side cartridges by manual or pneumatically powered injection guns.
- Through a static mixing nozzle that homogeneously mixes the material without any hand mixing.

The Department may perform supplementary sampling and testing of the joint sealants. Deliver sealant in the manufacturer’s original sealed container legibly marked with the:
- Manufacturer’s name.
- Trade name of the sealant.
- Manufacturer’s lot or batch number.
- Pouring temperature.
- Safe heating temperature.

502-2.01 Concrete. Use materials meeting the requirements of 501-2.02
Design a concrete mixture proportioned according to AASHTO PP 84, *Developing Performance Engineered Concrete Pavement Mixtures*, for the below specified performance criteria. The mix shall have a well graded aggregate gradation to minimize the paste content while maintaining workability. Aggregate gradation shall meet the requirements of the Tarantula curve (or Shilstone method or 8-18 method) as defined by FHWA at [https://www.fhwa.dot.gov/pavement/concrete/pubs/hif15019.pdf](https://www.fhwa.dot.gov/pavement/concrete/pubs/hif15019.pdf)

Produce a homogeneous mixture of cement, pozzolan (fly ash or GGBFS), fine aggregate, coarse aggregate, air entraining agent, water-reducing and set-retarding admixture, and water using NYSDOT Approved List materials. Other admixtures may be used as approved by the Director, Materials Bureau.

Design a concrete mixture to meet the following requirements:

- Compressive Strength of 3000 psi minimum at 28 days.
- Flexural Strength of 600 psi minimum at 28 days.
- Slump: As desired by contractor for workability.
- Entrained Air: 5% to 8%.
- Super Air Meter (SAM) number <0.20 using AASHTO TP118
- Water/Total Cementitious Material Ratio: 0.40 maximum.
- Paste volume maximum 25%
- Resistivity >16.5 kΩ-cm using AASHTO T358

Perform mix development testing in accordance with ASTM C143, C231, C192, C39, AASHTO T358 and AASHTO TP118 to assure all performance criteria can be achieved during production and placement.

Prior to the start of any concrete placement, provide a copy of the proposed mixture design(s) and trial batch test results to the Director, Materials Bureau, submitted through the Regional Materials Engineer, for evaluation. Trial batch must be performed in the presence of the Engineer. Submit sufficient data to permit the Director to offer an informed evaluation. Include at least the following:

- Concrete mix proportions
- Aggregate composite gradation of mixture.
- Material sources. Include fineness modulus and specific gravity for all aggregates.
- Compressive and Flexural Strength at desired age of opening to traffic, with 28 day results for records when available.
- Target slump for placement
- Target air content of plastic concrete.
- SAM number results of trail mix
- Paste volume calculations for mix
- Resistivity test data

Substantial changes to the approved mix design will not be allowed.

502-2.02 This subsection is intentionally blank.

502-2.03 This subsection is intentionally blank.
502-2.04 Equipment. Provide the Engineer with an equipment list and specifications a minimum of 14 days prior to the planned start of PCC paving. Bring all equipment needed to place, consolidate, finish, texture, cure, saw cut, seal, and test the PCC pavement and permeable base to the job site a minimum of 1 full work day before its use to allow examination by the Engineer. Repair or replace any equipment found to be defective before or during its use. Discontinue any operation if unsatisfactory results are being obtained. Use of equipment other than described below is subject to the approval of the Director, Materials Bureau.

A. Slipform Paving. Slipform paving consists of a single paver, or a placer/spreader followed by a separate paver, capable of placing, spreading, consolidating, screeding, and finishing the concrete such that hand finishing is kept to a minimum. Use a self-propelled slipform paver equipped with:
- Rigid side forms that laterally support the concrete and minimize edge slumping.
- A full-width finishing pan.
- Attached internal vibrators capable of consolidating the entire concrete placement.
- Use equipment guided by a reference system that ensures the pavement is placed to the specified line, grade, and cross section.

B. Fixed Form Paving

1. Forms. Use straight forms without horizontal joints meeting Table 502-1, Form Requirements, and equipped with:
   - At least 3 stake pockets spaced 3 feet apart (maximum), each having a positive, nondetachable wedge.
   - Positive, interlocking devices capable of holding abutting sections together to form neat, tight joints.

<table>
<thead>
<tr>
<th>TABLE 502-1 FORM REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristic</td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Length</td>
</tr>
<tr>
<td>Depth</td>
</tr>
<tr>
<td>Base Width</td>
</tr>
<tr>
<td>Horizontal Top Face</td>
</tr>
<tr>
<td>Vertical Face</td>
</tr>
<tr>
<td>Flange Bracing</td>
</tr>
</tbody>
</table>

Flexible, curved, or wooden forms may be used in irregular areas or curved sections having horizontal radii of 100 feet or less.
2. **Paving Equipment.** Use fixed form paving equipment specifically made for placing concrete. The equipment must be capable of placing, spreading, consolidating, screeding, and finishing the concrete to the specified line, grade, and cross section such that hand finishing is kept to a minimum. Use equipment with either attached internal vibrators or in conjunction with hand-held internal vibrators.

C. **Vibrators.** Use paver-mounted internal vibrators capable of consolidating the entire concrete placement that are:
- Capable of being shut off without shutting off the paver.
- Equipped with frequency controls readily accessible to the paver operator.
- Capable of simultaneously operating at the same frequency as the other paver-mounted vibrators.
- Capable of operating through a frequency range of 6,000 - 10,000 vibrations per minute.

Check vibrator operating frequencies daily when paving begins. Check frequencies under load with the Engineer present. If the paver is not equipped with direct-read frequency gauges for each vibrator, supply the Engineer with a calibrated, hand-held tachometer, including instructions, to monitor vibrator frequencies. The tachometer will remain the Contractor’s property after paving is complete.

Use hand-held vibrators capable of operating through a frequency range of 6,000 - 10,000 vibrations per minute in any location that is not consolidated by internal vibrators attached to the paving equipment.

D. **This subsection is intentionally blank.**

E. **Saw Cutting Equipment.** Use diamond blade saws capable of making straight cuts to the dimensions depicted in the Standard Sheets that are equipped with cutting guides, blade guards, water cooling systems, dust controls, and cut depth control.

Maintain equipment and supplies to ensure uninterrupted saw cutting. Early entry saws require approval from the Director, Materials Bureau. Submit requests to use early entry saws at least 7 calendar days before paving.

F. **Curing Compound Applicators.** Use atomizing mechanical sprayers capable of exerting consistent pressure without hand pumping that are equipped with tank agitators to continuously mix the curing compound. Use nozzles with spray shields to prevent drift. Flush nozzles daily before use.

Maintain equipment and supplies, including extra nozzles, to ensure uninterrupted curing compound application. In a slip form paving operation, use self-propelled applicators guided by the same reference system as the slip form paver. In a fixed form operation, applicators need not be self-propelled.

G. **The subsection is intentionally blank.**
H. **Diamond Grinding.** Use equipment having gang-mounted diamond saw blades on a multiblade arbor specifically designed for pavement bump cutting or production grinding. When production grinding, use equipment capable of producing a 4 foot (minimum) grinding pass width that is equipped with a vacuum system capable of removing slurry from the pavement surface. Use blade spacers having a minimum thickness of 0.105 inches. Inform the Engineer of the spacer thickness selected.

I. **Drills.** Use gang drills with a minimum of 2 independently powered and driven drills. Use tungsten carbide drill bits. Rest and reference the drill rig frame on and to the pavement surface such that the drilled holes are cylindrical, perpendicular to the surface being drilled, and repeatable in terms of position and alignment. Hand-held drills are permitted for drilling holes in longitudinal joints if there is not enough room to use gang drills resting on the pavement surface.

J. **The subsection is intentionally blank.**

K. **Joint Sealing - Highway Joint Sealant.** Heat the sealant in a melter constructed either:
   - As a double boiler with the space between inner and outer shells filled with oil or other heat-transfer medium.
   - With internal tubes or coils carrying the sealant through a heated oil bath and into a heated double-wall hopper.

   Do not use direct heating. Use a melter capable of maintaining the sealant’s pouring temperature and providing homogeneous sealant equipped with:
   - Positive temperature control.
   - Continuous full sweep mechanical agitation.
   - Separate thermometers indicating the temperatures of the heat transfer medium and the sealant in the hopper. Do not place any sealant if the thermometers are defective or missing.

   Provide 2 thermometers having stems 18 inches long and temperature ranges sufficient to meet the requirements of this specification. Use a discharge hose equipped with a controlled heating apparatus or sufficiently insulated to maintain the proper sealant pouring temperature. Use nozzles that apply the joint sealant within the joint confines for the full width and depth of the joint.

L. **Air Blasting Equipment.** Use equipment with traps or other installed devices that prevent moisture and oil from contaminating the concrete surface. Use a compressor that delivers air at a minimum of 120 cfm and develops a minimum nozzle pressure of 90 psi. Check the compressed air stream purity daily with a clean white cloth.
Convene a prepaave meeting 7 to 14 days before the planned start of paving with the Engineer and any PCC paving and saw cutting subcontractors to coordinate all aspects of paving and inspection, including equipment review, construction methods, and time and personnel requirements.

Construct a smooth, well consolidated, properly finished, textured, and cured pavement to the line and grade depicted in the contract documents, ± 1/4 inch vertically at any location.

Acceptance criteria for the Concrete shall be:

- Air content 5% to 8%, tested at the control series frequency per Materials Method 9.2
- SAM number <0.20, tested at the Cylinder series frequency per Materials Method 9.2
- Compressive strength >3000 psi using 6” x 12” cylinders tested at the Cylinder series frequency per Materials Method 9.2

**Surface Resistivity.** The Contractor shall measure Surface resistivity and submit the results to the EIC for information only. Collect data in accordance to AASHTO T358 using 6 - 4” x 8” cylinders cast for each day’s placement with samples taken randomly from 2 different trucks of a placement. Test samples will be cured for 28 days following the requirements of ASTM C31 (15), Standard Practice for Making and Curing Concrete Test Specimens in the Field. The results of all test cylinder specimens representing an element placed, or part thereof, on a given day will be averaged to determine the Resistivity for each placement.

### 502-3.01 Weather Limitations

**A. Rain.** Do not pave in the rain. Supply sufficient quilted covers, plastic coated fiber blankets, or polyethylene curing covers near the paving operation when rain may be expected. Securely cover any concrete exposed to rain that has not reached initial set or will be visibly affected by the rain.

**B. Cold Weather.** Place concrete when the air temperature is 40°F and rising, or warmer, and when the surface temperature of the area to be paved is 40°F, or warmer. Stop paving when the air temperature falls below 40°F. Measure temperatures in the shade to an accuracy of 1°F. Refer to §502-3.11C, Cold Weather Curing.

### 502-3.02 Subbase Course

Furnish in accordance with Section 304, Subbase Course, before placing any PCC. If the area is available, extend the prepared subbase course at the same line, grade, and cross slope as the area being paved such that it is at least:

- 3 feet beyond the longitudinal edges of a slipform pavement.
- 1 foot beyond the outside longitudinal edges of the fixed forms.

Additional subbase course that is not included in the finished work will be paid for under Section 304 items included in the contract.

### 502-3.03 This subsection is intentionally blank.
502-3.04 Slipform Paving. Use equipment meeting §502-2.04A, Slip Form Paving. Establish a reference system to achieve the specified smoothness level. If string lines are used, set them by survey and use dual lines whenever possible.

Maintain uniform concrete quality and head in front of the paver. Coordinate concrete delivery to maintain continuous forward movement of the paver and avoid excessive delivery truck queues. Keep paver tracks clear of concrete and debris before and during paving.

Wet the entire subbase surface without forming puddles or mud immediately before placing concrete.

Consolidate the entire concrete placement using internal vibrators attached to the machine. Combine paver forward speed, vibrator frequency, and vibrator depth to consolidate the concrete without segregation, vibrator trails, or contacting the joint assemblies. Discontinue vibration and tamping if the paver stops.

Determine edge slump by extending a 2 foot (minimum) long straightedge over the longitudinal pavement edges. Immediately correct edge slumps greater than 1/4 inch that are between concrete placements and greater than 3/8 inch at free edges and HMA shoulders.

502-3.05 Fixed Form Paving.

A. Setting Forms. Use forms meeting §502-2.04B1, Forms. Compact the supporting layer at the form line such that the forms are supported for their full length. Set forms to string lines placed at the pavement elevation, line, and grade and to achieve the specified smoothness. If a form sits above the string line, remove the form and trim the form line to the proper grade. If a form sits below string line, remove the form and fill and compact the low area with granular material at least 6 inches on both sides of the form. Frequently check form grade and alignment while paving. Reset forms as necessary.

Set forms to accommodate a full days paving before placing concrete. Extend forms beyond construction bulkheads to provide a working platform at the end of a placement. Secure each form with a minimum of 3 pins each of sufficient length to hold the forms in place without movement during any operation. Lock the forms together such that the form ends are aligned and the joints are tight and smooth. Run the paving equipment atop the forms before placing any concrete and recheck form alignment. Reset forms as necessary.

Align keyway strips in a smooth, horizontal plane, parallel to the top of the form. Match keyway strips on abutting forms such that a nearly seamless keyway results.

B. Paving. Use equipment meeting §502-2.04B2, Paving Equipment. Apply oil to forms before placing concrete. Immediately before placing concrete, wet the entire subbase surface without forming puddles or mud. Uniformly distribute the concrete in front of the paver by maneuvering the delivery truck chute. If concrete is spread by hand, use come-alongs or shovels. Do not use rakes or hand-held vibrators to spread concrete.

Maintain uniform concrete quality and head in front of the paving machine and without running over the screeds. Coordinate concrete delivery to maintain continuous forward movement of the paver and avoid excessive delivery truck queues. Keep form tops clean before and during paving. Consolidate the entire concrete placement using internal vibrators attached to the paver. Combine paver forward speed, vibrator frequency, and vibrator depth to consolidate the concrete without
segregation, vibrator trails, or contacting the joint assemblies. Discontinue vibration and tamping if
the paver stops.

Use hand-held vibrators ahead of the paving equipment to consolidate all concrete not
consolidated by machine-mounted internal vibrators. Keep hand-held vibrators perpendicular to the
pavement surface. Vibrate between 2 and 4 seconds in each location, overlapping adjacent locations.
Do not drag vibrators through the concrete. Do not walk through consolidated concrete.

Mark the midpoint (± ½ inch) of each transverse contraction joint such that the saw cut operator
can accurately locate the first-stage saw cut locations.

C. This subsection is intentionally blank.

D. Form Removal. Remove forms after the concrete has developed sufficient strength to allow
removal without damaging the pavement. Repair pavement damaged during form removal. Remove
forms before making second-stage saw cuts.

502-3.06 Joint Construction. Provide the Engineer approved Materials Details for longitudinal joint
ties and transverse joint supports before placing any joint hardware. Construct joints in accordance with
the Standard Sheets and approved Materials Details. Do not stand on joint hardware.

Base final joint layout on construction staging and the actual location of utilities, drainage
structures, intersections, tapers, and other irregular areas. When pavement panels are tied to moment
slabs, match transverse joints in the moment slab with the transverse joints in the pavement. No moment
slab should be tied to more than 2 pavement slabs at a time.

Submit a proposed joint layout to the Engineer at least 14 calendar days prior to PCC paving.
Obtain the Engineer’s joint layout approval before paving. Include moment slab joints and final pavement
marking layout, in the joint layout that is submitted to the engineer.

Inserting dowels and/or longitudinal joint ties into plastic concrete will be considered in
accordance with the written procedures of the Materials Bureau. Submit a plan to verify dowel and tie
locations, depth, and alignment. Do not insert dowels or ties until the plan is approved by the Engineer.

Make second-stage saw cuts and bevels, clean, and seal joints in accordance with §502-3.12,
Sealing Joints.

A. Transverse Joints. Transverse joints include contraction, expansion, hinge, and construction
joints. Secure joint supports to the subbase as depicted in the Materials Details. Maintain joint
supports in their proper position and alignment during paving.

Construct transverse joints perpendicular to both the pavement surface and longitudinal joints in
the area being paved. Use a 15 foot typical transverse joint spacing for pavements having standard
slab widths of 12 and 14 feet. For pavements having other slab widths, determine typical maximum
and minimum transverse joint spacings in accordance with the following:

\[ L_{\text{max}} = W_{\text{min}} \times 1.33 \]
\[ L_{\text{min}} = W_{\text{max}} \div 1.33 \]

where:
ITEM 502.RLCF6011 Performance Engineered Mixture –

ITEM 502.10516011 Portland Cement Concrete Pavement

ITEM 502.11516011 Constructing Transverse Joints

ITEM 502.20516011 Constructing Longitudinal Joints

ITEM 502.30516011 Sealing Transverse Joints – Highway Joint Sealant

ITEM 502.30516011 Sealing Longitudinal Joints – Highway Joint Sealant

\( L_{\text{max}} \) = maximum transverse joint spacing (slab length)
\( L_{\text{min}} \) = minimum transverse joint spacing (slab length)
\( W_{\text{max}} \) = maximum slab width across the pavement (load carrying slabs only)
\( W_{\text{max}} \leq 15 \text{ feet} \)
\( W_{\text{min}} \) = minimum slab width across the pavement (load carrying slabs only)

1. **Transverse Contraction Joints.** All transverse joints are contraction joints unless otherwise shown in the contract documents. Contraction joints are constructed in a straight line across the full width of the PCC pavement and shoulders. Contraction joints may be slightly angled (rather than straight across a pavement) at tied longitudinal joints between lanes placed separately if the placements do not have the same centerline, e.g., where a ramp centerline diverges from parallel to the pavement centerline. Contraction joints may terminate at, or be misaligned at, untied longitudinal joints as discussed in §502-3.06B3, Untied Longitudinal Joints with Keyway.

   Store transverse contraction joint support assemblies in inverted stacks at the project site. Cover epoxy coated steel such that it is protected from direct sunlight. Handle joint supports such that no twisting or bending occurs during storage and positioning. Supports with bent, twisted, or deformed wires will be rejected.

   Before placing concrete, position transverse joint supports such that the:
   - Entire longitudinal axis of each dowel is located at the mid-depth of the pavement slab or up to 1 inch below the mid-depth of the slab.
   - Longitudinal axes of the dowels are aligned parallel with the pavement centerline and pavement surface such that the maximum misalignment of one dowel end relative to the other is ¼ inch.
   - Midpoint of the longitudinal axis of each dowel is at the center of the joint (±1 inch).
   - Longitudinal axes of the two end dowels are 4 to 8 inches from the longitudinal joints.
   - Longitudinal axes of the dowels are spaced 4 to 12 inches apart.

   Mark the location of each transverse joint on the subbase before placing concrete such that the assembly is properly positioned. Also mark the longitudinal midpoints of the dowels such that the saw cut operator can accurately locate first-stage saw cuts. In a slipform paving operation, mark the joint support midpoint on the subbase immediately adjacent to the pavement. In a fixed form paving operation, mark the joint support midpoint on the form or such that the saw cut operator can easily locate the joint midpoint. Do not cut the shipping wires.

   Use saws meeting §502-2.04E, Saw Cutting Equipment. Make first-stage saw cuts as soon as the concrete has hardened sufficiently to permit sawing without causing raveling wider than 1/8 inch. Replace blades if raveling persists. Center first-stage saw cuts within 1 inch of the longitudinal midpoints of the dowels.

   Complete first-stage saw cuts before any uncontrolled cracking occurs. Be prepared to make first-stage saw cuts 24 hours a day to prevent uncontrolled cracking. Provide lighting required to make first-stage saw cuts at night at no additional cost to the State.

   Sweep or wash first-stage saw cut debris from the pavement before profiling, before it rains, or before opening the pavement to any traffic, such that debris does not enter the joint.
2. **Transverse Expansion Joints.** Construct transverse expansion joints as part of the utility and drainage structure isolation systems depicted in the Standard Sheets or where indicated in the contract documents. Handle and position expansion joint supports in accordance with §502-3.06A1, Transverse Contraction Joints.

Construct expansion joints using 3/8 to 5/8 inches thick premoulded resilient joint filler placed in 1 piece between longitudinal joints. Tightly place and support abutting sections of joint filler such that no concrete infiltrates the joint. Place expansion caps on the dowels as depicted in the Materials Details. Do not tap or hammer the caps onto the dowels.

No saw cuts are required in expansion joint construction. Remove the finishing cap, if supplied, after the concrete has developed sufficient strength to prevent damage.

3. **Transverse Construction Joints.** Construct transverse construction joints wherever there is an interruption of more than 30 minutes in concrete paving operations. Construct these joints as wide as the concrete placement, typically 1 or 2 lanes, but not necessarily the full pavement width. Align construction joints with transverse contraction or construction joints in adjacent lanes. Refer to Table 502-2 for choosing the proper construction joint type.

<table>
<thead>
<tr>
<th>Planned Unplanned</th>
<th>Paving Method</th>
<th>Adjacent Pavement</th>
<th>Joint Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planned</td>
<td>Slip Form</td>
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<td>Saw Cut or Bulkhead</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>Bulkhead</td>
</tr>
<tr>
<td>Fixed Form</td>
<td></td>
<td>No</td>
<td>Saw Cut or Bulkhead</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>Bulkhead</td>
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<td>Unplanned</td>
<td>Slip Form</td>
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<td>Saw Cut</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>Removal</td>
</tr>
</tbody>
</table>

a. **Bulkheads.** Bulkheads may be slotted or solid. Place a slotted bulkhead over the dowels of an exposed joint assembly such that half of the dowel lengths are embedded within newly placed concrete. Immediately remove plastic concrete in front of the bulkhead and from the exposed joint support.

The transverse joint assembly may be omitted and a solid bulkhead may be used. In this case, drill and anchor dowels, if required, into the transverse joint in accordance with §502-3.06D, Drill and Anchor Dowels or Ties, such that they meet the positioning requirements of §502-3.06A1, Transverse Contraction Joints. In either case, ensure the bulkhead is capable of supporting the weight of the plastic concrete.

b. **Saw Cut.** Saw cut full depth construction joints at locations that satisfy the minimum and maximum slab length requirements of §502-3.06A, Transverse Joints. Saw cut when the
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Concrete has obtained sufficient strength to be saw cut without damage to concrete to remain in place. Do not cut within 12 inches of a longitudinal joint tie. Remove the hardened concrete ahead of the saw cut. Drill and anchor dowels, if required, into the saw cut face in accordance with §502-3.06D, Drill and Anchor Dowels or Ties, such that they meet the positioning requirements of §502-3.06A1, Transverse Contraction Joints. Do not drill into longitudinal joint ties.

In lieu of drilling holes, the contractor may use transverse joint supports fabricated with closed-end, hollow plastic cylinders instead of dowels. Use hollow cylinders with outer diameters equal to the drilled hole diameters described in §502-3.06D, Drill and Anchor Dowels or Ties. Position cylinders as required in §502-3.06A1, Transverse Contraction Joints.

Saw cut the newly placed concrete full depth and full width through the midpoint of the longitudinal axis of each cylinder (± 1 inch). Remove hardened concrete and the joint assembly ahead of the saw cut. Remove the hollow cylinder embedded in the concrete that remains and anchor the dowels in accordance with §502-3.06D, Drill and Anchor Dowels or Ties, to the required alignment in §502-3.06A1, Transverse Contraction Joints.

c. Removal. Remove all concrete to the midpoint of the preceding transverse joint without damaging the dowels, dowel coatings, or the pavement to remain in place.

4. Transverse Hinge Joints. Do not place hinge joints without the Engineer’s approval. Construct transverse hinge joints when a slab length exceeds the geometric requirements of §502-3.06, Transverse Joints. (This situation typically occurs near structures that are skewed from perpendicular to the pavement centerline.) Locate hinge joints such that they are equally spaced between other types of transverse joints. Construct hinge joints in accordance with 502-3.06A1, Transverse Contraction Joints, except the positioning requirements do not apply. Instead, position transverse hinge joint supports such that the:
- Entire longitudinal axis of each deformed bar is located at the mid-depth of the pavement slab or up to 1 inch below the mid-depth of the slab.
- Longitudinal axes of the bars are aligned parallel with the pavement centerline and pavement surface such that the maximum misalignment of one bar end relative to the other is 1 inch.
- Midpoint of the longitudinal axis of each bar is at the center of the joint (±1 inch).
- Longitudinal axes of the two end bars are 4 to 10 inches from the longitudinal joints.
- Longitudinal axes of adjacent bars are spaced 4 to 18 inches apart.

B. Longitudinal Joints. When required, Select tie type, size, spacing, and positioning in accordance with the contract documents. Provide a minimum clearance of 3 inches between the end ties in a slab and any part of the transverse joint support. Keep ties free of materials that inhibit bonding to concrete or anchoring material. Maintain ties in their proper position during paving.

Eliminating a longitudinal joint (and subsequent sawing and sealing) between a shoulder and adjacent lane is optional provided (1) the lane and shoulder are paved simultaneously and (2) the resulting slabs meet the geometric requirements detailed in §502-3.06A, Transverse Joints.
When longitudinal joints do not align with permanent pavement markings, the Contractor shall furnish additional longitudinal joint ties at a minimum of ½ the normal longitudinal joint spacing.

1. **Longitudinal Joints Between Lanes Paved Simultaneously.** Use one-piece ties fabricated into assemblies capable of securely holding 2 or more ties. Secure the assemblies to subbase prior to paving in accordance with the Materials Details.

   Make first-stage saw cuts parallel to the pavement centerline and perpendicular to the pavement surface before uncontrolled cracking occurs. Use equipment specified in §502-2.04E, Saw Cutting Equipment. Replace saw blades if raveling wider than 1/8 inch occurs. Center first-stage saw cuts within 1 inch of the longitudinal midpoint of the ties.

   Sweep or wash first-stage saw cut debris from the pavement before profiling, before it rains, or before opening the pavement to any traffic, such that debris does not enter the joint.

2. **Tied Longitudinal Joints Between Lanes Paved Separately.** In a slip form operation, construct a butt joint and drill and anchor one-piece ties into the hardened concrete in accordance with §502-3.06D, Drill and Anchor Dowels and Ties.

   Use # 6 ties, 28 inches long between travel lanes and 18 inches long between a travel lane and a PCC shoulder. Anchor ties between travel lanes 12 inches into the previously placed concrete, leaving 16 inches projecting from the joint face. Anchor ties between a travel lane and a PCC shoulder 8 inches into the previously placed concrete, leaving 10 inches projecting from the joint face.

   Place end ties in a slab 12 to 14 inches from the transverse joint. Typically, space ties between the end ties 24 inches apart, maximum. Pavements having 4 or more tied lanes, or 3 lane pavements 12 inches (or more) thick, may require a decreased spacing in accordance with the contract documents.

   In a fixed form operation, construct either a butt or a keyed joint. If a butt joint is constructed, drill and anchor longitudinal joint ties as described above. If a keyed joint is constructed, use multiple-piece ties. Apply a corrosion inhibiting coating to the threads of all components before assembly. Bolt the female portion of the tie to the form prior to paving as depicted in the Standard Sheets. Insert and tighten the male ends before paving the adjacent lane. Ensure all threaded connections are tight.

   First-stage saw cuts are not required between lanes paved separately.

3. **Untied Longitudinal Joints with Keyway.** Construct untied longitudinal joints with keyways at utilities and/or drainage structures, at intersections, between adjacent lanes having non-parallel center lines (such as ramps), or where indicated in the contract documents. Form as depicted in the Standard Sheets. Transverse joint type, location, and alignment may be changed when a transverse joint intersects an untied longitudinal joint.

   Patch honeycombing along the untied longitudinal joint face to achieve a smooth surface prior to applying the bond breaker and placing the adjacent concrete.

   First-stage saw cuts are not required.

**C. Utility and Drainage Structures and Telescoping Manholes.**
Detail jointing around each utility and drainage structure in the proposed joint layout submitted to the Engineer for approval. When possible, do not isolate, or “box out,” utilities and drainage structures from the pavement. Instead, set and center utilities and drainage structures between transverse joints. Use a minimum slab length, \( L_{\text{min}} \), as defined in §502-3.06A, Transverse Joints. Reinforce the slab that contains the structure. Select reinforcement size and spacing such that:

\[
A_s \geq 0.0018(s)(t)
\]

where:

- \( A_s \) = Area of a steel bar (in\(^2\))
- \( s \) = Spacing of steel bars (in). Minimum 3” clearance between bars.
- \( t \) = Slab thickness (in)

Use mat reinforcement with steel in both directions. Use top and bottom double mat reinforcement for slabs thicker than 10”. Refer to the Standard Sheet for mat reinforcement placement locations. Pave the slab with the structures at the same time as the surrounding pavement. When using telescoping manholes, remove temporary support bolts from the telescoping manhole casting as soon as the concrete hardens.

**D. Drill and Anchor Dowels or Ties.** Use drills meeting §502-2.04I and chemically curing anchoring material meeting §701-07. Do not drill holes until the concrete has developed sufficient strength to withstand drilling without damage. Damage from drilling will be treated in accordance with §502-3.14, Damaged or Defective Concrete.

Drill such that the hole diameters are in accordance with the anchoring material manufacturer’s written recommendations. Give those recommendations to the Engineer before drilling any holes. Replace worn bits when necessary to ensure the proper hole diameter is drilled.

Follow the anchoring material manufacturer’s written recommendations for cleaning the holes. Give those recommendations to the Engineer. As a minimum, clean the drilled holes with compressed air using equipment meeting 502-2.04L, Air Blasting Equipment. Insert the nozzle to the back of the hole to force out all dust and debris.

When using new cartridges of anchoring material, ensure the initial material exiting the nozzle appears uniformly mixed. If it is not uniformly mixed, waste the material until uniformly mixed material extrudes.

Place the anchoring material in the back of the hole using a nozzle of sufficient length. Push the dowel or tie into the hole while twisting such that the air pocket within the hole is heard to burst and the anchoring material is evenly distributed around the bar. Use sufficient amounts of anchoring material such that it slightly extrudes out the hole as the bar is inserted.

**502-3.07 Paving Adjacent To Existing Concrete.** Wherever paving equipment operates on existing PCC pavement that is to remain, install bolt-on track covers or rubber tired, flangeless wheels. Remove all debris on the existing PCC pavement in the equipment track. Immediately remove any concrete that spills onto the existing concrete.
When paving from (or to) a transverse construction joint or intersecting pavement, use hand-held vibrators to thoroughly consolidate any concrete inaccessible to the paving equipment vibrators. Hand finish these areas with the minimum effort required to produce an acceptable surface. Do not dump the grout box head into the pavement concrete when approaching a construction joint.

502-3.08 Plastic Thickness Determination. Provide the Engineer with a round, rigid, nonaluminum probe, having a 1/8 inch diameter. The Engineer will determine the plastic concrete thickness by inserting the probe and measuring the insertion depth. The Engineer will check thickness at least every 150 feet of paving and at least 2 feet from the placed edge. Keep several probes at the project.

The minimum measured plastic thickness must be equal to (-1/4 inch) or greater than the thickness required in the contract documents. Areas not meeting minimum thickness will be treated in accordance with §502-3.14, Damaged or Defective Concrete. If 2 consecutive measurements do not meet minimum thickness, stop paving and reestablish the paving operation to achieve acceptable thickness.

502-3.09 Finishing. Mechanically finish the pavement after consolidation and strike off. Use machine mounted finishers such as full-width finishing pans, transverse oscillating screeds, longitudinal floats, pan floats or separate pieces of equipment such as tube floats. Correct bumps with a 16 foot straight edge or bump cutter specifically made for finishing concrete.

After mechanical finishing, hand finish the pavement to correct and seal minor imperfections. Provide an ACI certified concrete flatwork finisher to supervise all hand finishing. Provide proof of ACI flatwork certification to the Engineer. Hand finish with magnesium floats, lutes, and/or trowels. Keep hand finishing to a minimum. Do not use excess mortar or discarded concrete to fill low areas. Use work bridges to hand finish concrete inaccessible from the pavement edge. Do not add water to the concrete surface to close imperfections. Stop paving or reformulate the concrete mix if surface imperfections that require additional water to close routinely occur.

502-3.10 Texturing. Immediately after finishing and prior to applying the curing compound, texture the concrete surface using one of the following procedures in accordance with the contract documents. Apply longitudinal tining if no texturing method is designated in the contract documents. If the contract has a closed drainage system, provide a 8 - 12 inch blank in the texture along the pavement edges to enhance drainage to catch basins.

A. Longitudinal Tining. Texture the concrete parallel to the pavement centerline with a set of evenly spaced spring steel tines. Use rectangular tines 1/8 inch wide, 1/32 inch thick, and approximately 5 inches long at a center-to-center spacing of 3/4 inches.

Operate the tine head manually or mechanically. In either case, hold the tines as near an angle of 45° to the concrete surface as possible to minimize mortar dragging. Produce tine texture 1/16 - 1/8 inch deep with minimal dislodging of aggregate. Do not make multiple tine passes in the same area. Keep tines 2 - 4 inches from the placement edges. Keep the tines free of hardened concrete.

B. Artificial Turf Drag. Use a seamless strip of artificial turf drag appearing on the Department's Approved List entitled “Turf Drag” under “Equipment, Concrete Related.” Produce a consistent texture, free of ridges or gouges, parallel to the pavement centerline either by hand or by attaching a
weighted strip to the paver, texture/cure machine, or work bridge. Periodically replace or clean the drag to remove hardened concrete paste that compromises texture.

502-3.11 Curing. Keep the curing operation close to the texturing operation such that concrete is cured immediately after it is textured. The Engineer may stop paving if curing lags. Cure concrete in accordance with Materials Bureau requirements based on the Contractor-submitted mix design and the trial batch evaluation.

A. White Pigmented Membrane Curing Compound. Typically, cure concrete with white pigmented membrane curing compound. Use equipment meeting §502-2.04F, Curing Compound Applicators. Mix the curing compound before each use and continuously agitate during use. Thoroughly and uniformly coat all exposed surfaces (including slipformed edges and formed edges immediately after form removal) at a minimum rate of 150 sf/gal such that the coated surfaces are completely white. Check the application rate after every paving day, including exposed vertical slab faces in the calculations. Apply the curing compound in 2 opposite direction passes with no longer than 15 minutes between passes.

Immediately reapply curing compound to any damaged coating areas during the curing period. During curing equipment breakdown, cure the pavement in accordance with §502-3.11B, Curing Covers. Do not apply curing compound in the rain. If rain damages the curing compound before it sets, reapply curing compound after the pavement surface dries.

B. Curing Covers. Use of curing covers is subject to the approval of the Engineer. Use quilted covers, plastic coated fiber blankets, or polyethylene curing covers. Do not use covers with tears or holes. Cover all exposed surfaces and extend the covers a minimum of 12 inches beyond the pavement edges or beyond the forms, when used. Overlap successive covers 12 inches, minimum. Secure the covers to keep them in contact with the entire surface and maintain the overlap. Wet the entire surface of quilted covers and maintain them in a wetted condition throughout the curing period.

C. Cold Weather Curing. Supply form insulating materials for winter concreting when the air temperature is expected to fall below 40°F at any time during the curing period. Use material capable of maintaining a surface temperature of 55°F and being easily removed and replaced to accommodate first-stage saw cuts. Apply the insulating material to prevent newly placed concrete from being exposed to air temperatures below 35°F for the curing period. Secure the insulation tight to the concrete surface to prevent air intrusion beneath the insulation. Extend the insulation 12 inches beyond the newly placed concrete. Insulate the pavement vertical edge and/or forms as well.

Place recording surface thermometers between the pavement surface and insulating material 12 inches from one of the placement edges wherever insulation is used. Use 4 equally spaced thermometers for each day’s paving. Do not subject the concrete to a temperature drop in excess of 50°F during the first 24 hours after removing the insulation.

502-3.12 Sealing Joints.
Permanent joint sealing of new concrete pavement must be completed by November 15th of the same calendar year as placement.
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First-stage sawcuts may be temporarily left unfilled if a placement is only subjected to occasional construction traffic, such as pickup trucks or cars. In this case, sweep the pavement to ensure debris does not enter the joints.

Temporarily fill unsealed first-stage cuts with jute or backer rod if a placement is:
- Subjected to consistent construction traffic.
- Used as a haul road for subsequent concrete placements.
- Temporarily opened to general traffic while final sealing has been delayed for convenience, such as to maximize sealing production.

Before cleaning, remove any temporary fillers and repair damaged joints in accordance with §502-3.14, Defective or Damaged Concrete, including chipped joints resulting from debris accumulation in an unfilled or unsealed joint.

A. Sealing Transverse and Longitudinal Joints - Highway Joint Sealant. Widen joints to 1/4 - 3/8 inch for a depth of 1 inch if the first-stage saw cuts are less than 1/4 inch wide to allow full-depth sealing. Immediately wash the widening cut slurry from the pavement such that it does not reenter the joint.

Clean the joints by abrasive blasting immediately before sealing. Keep the nozzle within 2 inches of the joint surfaces. The Engineer may allow pressure washing in lieu of abrasive blast cleaning if it is not allowed in the contract. When pressure washing, use (1) a 900 psi minimum pressure and (2) a maximum pressure such that no damage occurs to the concrete. Manually dislodge debris remaining in the joint after cleaning, and reclean the joint. Immediately after pressure washing, air blast the joint to remove any debris from the cut and dry the exposed faces.

Do not allow any traffic on the pavement between cleaning and sealing. Reclean the joint if it rains between cleaning and sealing or if any traffic is on the placement between cleaning and sealing. Provide the Engineer a copy of the sealant Manufacturer's written recommendations for heating and application at least 1 work day before sealing. Follow those recommendations. Unless stated otherwise, the recommended pouring temperature is 40°F below the manufacturer's designated safe heating temperature, with an allowable variation of 40°F.

Prior to sealing, discharge sealant from the applicator wand into a vessel and measure the sealant temperature. The temperature must be equal to or above the Manufacturer's recommended minimum pouring temperature and equal to or below the Manufacturer’s recommended safe heating temperature.

Do not use sealant heated above the safe heating temperature. Sealant may be reheated or heated in excess of 6 hours if allowed by the Manufacturer’s heating and application recommendations. In these cases, recharge the melter with fresh sealant amounting to at least 20% of the sealant volume remaining in the melter.

Seal joints immediately after cleaning. Use equipment meeting the requirements of §502-2.04K, Joint Sealing, Highway Joint Sealant. Seal the joint from the bottom of the cut to within 1/2 inch of the pavement surface. Seal when the:
- Air and surface temperatures are 40°F or warmer.
- Air temperature is above the dew point.
- Pavement surface and all joint surfaces are dry.
Open to traffic after the sealant has cured to prevent tracking. Do not blot with fine aggregate.

**B. The subsection is intentionally blank.**

**C. Sealing Joints - Preformed Joint Sealers.** Make second-stage saw cuts and/or bevels in accordance with the Standard Sheets and (1) no sooner than 72 hours after concrete placement and (2) after the curing period has ended if curing covers are used. Extend the second-stage saw cut vertically down the free concrete edges. Wash the resulting slurry from the pavement and joint immediately after making second-stage saw cuts and/or bevels.

Second-stage saw cuts may be delayed for convenience, but do not leave second-stage saw cuts unsealed or unfilled while open to any traffic. Temporarily fill second-stage saw cuts with jute or backer rod if (1) they are exposed to any traffic before cleaning and sealing or (2) weather conditions are not favorable for timely (within 2 calendar days) cleaning and sealing, whether or not they are exposed to any traffic.

Clean the joints by pressure washing before sealing. Use (1) a 900 psi minimum pressure and (2) a maximum pressure such that no damage occurs to the concrete. Manually dislodge debris remaining in the joint after cleaning, and reclean the joint. Within 24 hours of pressure washing, air blast the joint to remove any debris from the cut and dry the exposed faces. Reclean the joint if it rains between cleaning and sealing. Do not allow any traffic on the pavement between cleaning and sealing.

Install the sealant in accordance with the Manufacturer’s written instructions. Give those instructions to the Engineer before any second-stage saw cutting begins. Lubricate the concrete, the sealer, or both before installation such that the lubricant fully covers the sealer/concrete interface, but not the top of the sealer.

Install one piece of transverse joint sealer in a compressed condition across the full pavement width, including concrete shoulders, and down the vertical saw cut at the free edge. Cut the longitudinal sealer where it crosses a transverse joint. Do not splice the longitudinal sealer between transverse joints. Seal the intersection between longitudinal and transverse sealers with lubricant.

Install the sealer such that it is not stretched more than 5%, nor compressed more than 2%, of the minimum theoretical length. Check the installation for stretch and compression by installing sealers in 5 transverse joints and removing the sealer immediately after installation and checking the length. An alternate method for checking stretch and compression, where applicable, may be performed by premarking or precutting the sealer to length prior to installation. If the measurement of any of these 5 sealers exhibits stretching in excess of 5% or compression in excess of 2%, modify the installation method to meet the requirements or discontinue installation.

Once sealing operations begin, remove 1 joint per 100 in the presence of the Engineer to check stretch and compression. If the sealer is found to be stretched in excess of 5% or compressed in excess of 2%, remove the sealer material from successive joints in both directions until sealers are found that meet the stretch and compression requirements. Replace all joints sealers found with excess stretch or compression. Replace joint sealers removed and found to meet the stretch and compression requirements.
502-3.13 Pavement Protection. Protect the pavement and appurtenances from traffic and construction operations. Protect the work and provide for traffic as indicated in the contract documents.

502-3.14 Damaged or Defective Concrete. The Engineer will identify all areas of damaged and defective concrete. Submit a repair plan for these areas. The repair plan is subject to the Engineer’s approval. Repair or replace all damaged or defective concrete in accordance with the approved repair plan prior to final acceptance at no cost to the State. Damage and defects include, but are not limited to, cracking, spalling, honeycombing, or imperfections caused by inadequate pavement protection, traffic, and/or construction practices. Slipformed concrete with inadequate plastic thickness as described in §502-3.08, Plastic Thickness Determination, will be rejected in 150 foot segment lengths.

502-3.15 Hardened Surface Tolerance (Nonprofilograhed Concrete). After the concrete has hardened sufficiently, test the entire longitudinal center of each travel lane, including ramps, with a 10 foot, minimum, long straight edge laid both longitudinally and transversely. The Engineer will mark longitudinal deviations in the pavement surface exceeding 1/4 inch in 15 feet and transverse deviations exceeding ¼ inch in 10 feet. Corrective action must be taken to repair surfaces out of tolerance.

Shoudlers and other areas not routinely exposed to traffic must meet ¼ inch in 10 feet both longitudinally and transversely.

502-3.16 The subsection is intentionally blank.

502-3.17 The subsection is intentionally blank.

502-3.18 Opening to Traffic. The pavement may be opened to general traffic if all the following apply:

- Average compressive strength of all cylinder pairs exceed 3000 psi.
- Average compressive strength of each cylinder pair exceeds 2500 psi.
- Appropriate time frame has elapsed for the entire area to be opened.
- Automobile only areas may be opened at 1500 psi.

Project Strength Determination. Provide an ACI Certified Concrete Field Testing Technician, Grade I, or higher, to cast all cylinders. Unless otherwise noted in the contract documents, use an agency accredited by the AASHTO Accreditation Program (AAP) in the field of construction materials testing of portland cement concrete to perform compressive strength testing. Cast and test in the presence of the Engineer, or the Engineer’s representative. Provide acceptable proof of ACI Certification and AASHTO Accreditation to the Engineer before placing any concrete.

The Engineer, or the Engineer’s representative, will complete the Concrete Cylinder Report as cylinders are cast and tested.

The Contractor may use one of the following methods for project strength determination:

1. Strength Determination Method 1. Cast a minimum of 3 cylinder pairs (6 total) from each 1000 feet of paving length, or fraction thereof, in accordance with Materials Method 9.2,
Field Inspection of Portland Cement Concrete. Cast each pair from different delivery trucks. Develop an Engineer-approved marking system that allows a cylinder to be readily associated with the corresponding placement location and placement time. Mark the cylinders and place them adjacent to the pavement under similar curing conditions. Determine the concrete compressive strength at the desired time in accordance with ASTM C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

If these conditions are not met, test 3 additional cylinder pairs at a later time, provided the appropriate numbers of additional cylinders were cast.

2. **Strength Determination Method 2.** Development of a concrete maturity curve will be accepted for project strength determination in lieu of compressive strength testing described above. Develop a maturity curve in accordance with ASTM C-1074 Standard Practice for Estimating Concrete Strength by the Maturity Method.

502-4 METHOD OF MEASUREMENT. The Engineer will measure the following quantities for items incorporated into the finished pavement:

502-4.01 This subsection is intentionally left blank.

502-4.02 PCC Pavement, Unreinforced. The work will be measured for payment as the number of cubic yards of unreinforced PCC pavement satisfactorily placed based on the payment lines shown in the contract documents. Deductions in 150 feet segment lengths will be made for areas that do not meet minimum plastic thickness requirements. Deductions (and separate payment) will be made for catch basins, manholes, or other similar pavement obstructions requiring either mesh reinforced or heavily reinforced placements.

502-4.03 PCC Pavement, Mesh or Heavily Reinforced. The work will be measured for payment as the number of cubic yards of reinforced concrete satisfactorily placed. No deductions will be made for drainage and utility structures or other similar pavement obstructions within the placement.

502-4.04 This subsection is intentionally blank.

502-4.05 Constructing Transverse Joints. The work will be measured for payment as the number of feet of transverse joints satisfactorily constructed.

502-4.06 Constructing Longitudinal Joints. The work will be measured for payment as the number of feet of longitudinal joints satisfactorily constructed.

502-4.07 Sealing Transverse Joints. The work will be measured for payment as the number of feet of transverse joints satisfactorily sealed, excluding preformed sealers turned down at the pavement edges.
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502-4.08 Sealing Longitudinal Joints. The work will be measured for payment as the number of feet of longitudinal joints satisfactorily sealed.

502-5 BASIS OF PAYMENT

502-5.01 This subsection is intentionally blank.

502-5.02 PCC Pavement, Unreinforced. Include the cost of all labor, material, and equipment necessary to satisfactorily perform the work, up to and including first-stage saw cuts, in the unit price bid for PCC Pavement, Unreinforced. No payment will be made for areas that do not meet minimum plastic thickness requirements. No additional payment will be made for Contractor-requested HES concrete mixes.

PCC Pavement, Unreinforced will be eligible for progress payments in accordance with the following:

-  90% upon satisfactory completion of all work up to, and including, first-stage saw cutting.
-  The remaining 10% upon satisfactory completion of the work.

502-5.03 This subsection is intentionally blank.

502-5.04 This subsection is intentionally blank.

502-5.05 PCC Pavement, Mesh or Heavily Reinforced. Include the cost of all labor, material, and equipment necessary to satisfactorily perform the work, up to and including first-stage saw cuts, in the unit price bid for PCC Pavement, Mesh or Heavily Reinforced. No payment will be made for areas that do not meet minimum plastic thickness requirements.

502-5.06 Constructing Transverse Joints. Include the cost of all labor, material, and equipment necessary to satisfactorily perform the work in the unit price bid for Constructing Transverse Joints.

502-5.07 Constructing Longitudinal Joints. Include the cost of all labor, material, and equipment necessary to satisfactorily perform the work in the unit price bid for Constructing Longitudinal Joints. Placing the inside shoulder and inside lane simultaneously, at the Contractor’s option, will not generate a Significant Change in the Character of Work. No additional payment will be provided for the additional number of longitudinal joint ties associated with:

-  Constructing butt joints between lanes placed separately in a slipform paving operation.
-  Constructing longitudinal joints in wheelpaths.

502-5.08 Sealing Transverse Joints. Include the cost of all labor, material, and equipment necessary to satisfactorily perform the work in the unit price bid for Sealing Transverse Joints.

502-5.09 Sealing Longitudinal Joints. Include the cost of all labor, material, and equipment necessary to satisfactorily perform the work in the unit price bid for Sealing Longitudinal Joints. Placing
the inside shoulder and inside lane simultaneously, at the Contractor's option, will not generate a Significant Change in the Character of Work.

*Payment will be made under:*

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ITEM 525.X0516011 - Diamond Grinding to an IRI Value of 70 Inches/Mile

ITEM 525.X0516111 - Diamond Grinding to an IRI Value of 70 Inches/Mile With Slurry Removal

ITEM 525.X0516211 - Bridge Deck and Approach Slab Diamond Grinding With Slurry Removal Square Yards

DESCRIPTION
This work shall consist of Diamond Grinding concrete surfaces to an International Roughness Index (IRI) value of 70 inches/mile in accordance with the contract documents and as directed by the Engineer.

MATERIALS AND EQUIPMENT
Provide the Engineer with certification that the equipment being used meets the requirements of this specification at least 7 days before start of operation. Maintain the equipment in proper working order. Immediately replace any out-of-round wheels. Do not use equipment that causes raveling, aggregate fractures, or joint deterioration.

Production Diamond Grinding Equipment. Use a self-propelled machine specifically designed for grinding and meeting the following requirements:

- Equipped with 50 – 60 gang-mounted diamond saw blades per foot on a multi-blade arbor capable of producing a 3 foot wide, minimum, strip of ground surface
- Using blade spacers having a minimum thickness of 0.105 inches. Inform the Engineer of spacer thickness selected.
- Equipped with a vacuum system capable of removing slurry from the pavement surface, leaving the surface in a clean, near-dry condition.
- Equipment must weigh a minimum of 35,000 pounds with the grinding head.
- Having an effective wheel base (distance from the transverse pivot points of the front wheel assembly and the profile/depth-control/ground drive wheels) of 12 feet minimum.

Inertial Profiler. Use an inertial profiler and operator that are certified by the NYS DOT to collect ride data for analysis. Perform testing in accordance with AASHTO R57. Certification must be dated in the same calendar year as testing.

CONSTRUCTION DETAILS
General. Diamond grind the surface longitudinally, beginning and ending at lines normal to the surface centerline, and in full travel lane width increments. Provide surface drainage by maintaining the proper surface cross slope and by blending adjacent passes. Grind such that there is no unground surface area between passes and the passes do not overlap by more than 1 inch.

Continuously vacuum the slurry from the surface when production grinding. If roadside slurry discharge is not allowed by the contract documents, transfer the slurry into equipment capable of transporting it from the contract site without spills. Dispose of slurry in conformance with all Federal, State, and local regulations.

Do not allow slurry to enter:

- Occupied travel lanes.
- Drainage structures.
- Wetlands, streams, estuaries, or sensitive environmental resources.
ITEM 525.X0516011 – Diamond Grinding to an IRI Value of 70 Inches/Mile
ITEM 525.X0516111 – Diamond Grinding to an IRI Value of 70 Inches/Mile With Slurry Removal
ITEM 525.X0516211 – Bridge Deck and Approach Slab Diamond Grinding With Slurry Removal Square Yards

- Areas where it will become a public nuisance.

After grinding, test the concrete surface using a 15 foot straightedge laid longitudinally and a 10 foot straightedge laid transversely. Re-grind any areas determined by the Engineer to exceed ¼ inch in 15 feet longitudinally and/or ¼ inch in 10 feet transversely.

**Production Grinding.** Grind the surface longitudinally such that at least 95% of the surface is diamond ground. Grind such that there is no unground surface area between passes and the passes do not overlap by more than 1 inch. Sections with overhead obstructions which prevent diamond grinding are exempt from grinding.

**Bridge Decks and Approach Slabs.** Grind surface to an approximate depth of 3/16 inch to obtain a smooth texture. Grind the surface longitudinally such that at least 95% of the surface is diamond ground. If the existing bridge joint system is to remain, feather the surface to match the existing joint elevation. Achieve a uniform cut which is flush to the existing joint.

Saw cut groove and apply penetrating sealer in accordance to the Contract documents and specifications after diamond grinding is complete. Payment for these items will be made under the appropriate items.

**Inertial Profiling.** Driving lane sections that are less than 528’ or have a posted speed limit less than 45 mile per hour will be exempt from inertial profiling requirements.

Measure and report pavement longitudinal profile for each section after diamond grinding is completed. Perform testing in accordance with AASHTO R57, Operating Inertial Profiling Systems. Provide the Engineer inertial profiler raw data, capable of being imported into PROVAL, from each wheelpath. Calculate IRI for each 528’ segment and each 25’ localized segment by averaging the wheel path IRI values within each segment. Report IRI to the Engineer. Each 528 foot segment must have an IRI of 70 in/mile or less and each 25 foot localized segment must be 140 in/mile or less.

**METHOD OF MEASUREMENT**

This work will be measured as the number of square yards of Diamond Grinding satisfactorily completed. No deductions will be made for isolated low areas, provided 95% of the surface is diamond ground.

**BASIS OF PAYMENT**

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

Payment will be made under:
Item No. Item Pay Unit
525. X0516011 Production Diamond Grinding to an 70in/mile Square Yards IRI
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525. X0516111  Production Diamond Grinding to an 70in/mile Square Yards IRI With Slurry Removal
525. X0516211  Bridge Deck and Approach Slab Diamond Grinding Square Yards With Slurry Removal
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.
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.
ITEM 557.2500NN16 - CRACK SEALING USING HIGH MOLECULAR WEIGHT METHACRYLATE – LINEAR CRACKS

DESCRIPTION
This work shall consist of furnishing and installing Crack Sealing Using High Molecular Weight Methacrylate in accordance with the contract documents and as directed by the Engineer.

MATERIALS
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 3.5 ounces
- 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.

CONSTRUCTION DETAILS
Abrasive blast clean the area to be treated, removing all contaminants from the surface. Clean all surfaces and cracks 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 sealer into the cracks.

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 traffic is permitted to resume.

METHOD OF MEASUREMENT
This work will be measured as the number of feet of Crack Sealing Using High Molecular Weight Methacrylate satisfactorily furnished and installed.

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 557.2600NN16 - CRACK SEALING USING HIGH MOLECULAR WEIGHT METHACRYLATE - FLOODING

DESCRIPTION
This work shall consist of furnishing and installing Crack Sealing Using High Molecular Weight Methacrylate in accordance with the contract documents and as directed by the Engineer.

MATERIALS
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.

CONSTRUCTION DETAILS
Abrasive blast clean the area to be treated, removing all contaminants from the surface. Clean all surfaces and cracks 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 gal. at a time. Sweep, pour, squeegee, or spray the area to receive the sealers, allowing the sealers to flow into the cracks. If the manufacturer does not recommend an application rate, use 8.5 to 11.8 square yards per gallon, as needed.

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 traffic is permitted to resume.

METHOD OF MEASUREMENT
This work will be measured as the number of square yards of Crack Sealing Using High Molecular Weight Methacrylate satisfactorily furnished and installed.

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

Under this item, the Contractor shall clean, furnish and place anti-graffiti protective coating on noise barrier walls, retaining walls, bridge structures, barriers, or other concrete surfaces at locations indicated in the contract documents or approved by the EIC. Wood surfaces shall not be treated with anti-graffiti protective coating under this item.

The Contractor shall apply the protective coating on selected surfaces within the limits in the contract documents. In addition, the Engineer may order that certain areas receive increased coverage or new locations be added.

MATERIALS

The protective coating shall be a breathable, one component clear non-sacrificial urethane or acrylic water based formulation designed as an anti-graffiti solution.

The Contractor shall provide the manufacturer’s product literature including surface preparation data, mixing, application, spread rates, storage and Volatile Organic Compounds (VOC) compliance certification.

All materials are to be approved by the Engineer and the Regional Landscape Architect before any work can begin.

CONSTRUCTION DETAILS

1. The selected surfaces shall be thoroughly cleaned of dust, dirt, grease, oil, loose materials or other objectionable materials before applying the protective coating. No sandblasting will be allowed. Anti-graffiti coating shall be applied as soon as practicable after cleaning is completed. If in the opinion of the Engineer, the surface has become soiled, or otherwise contaminated, prior to the application of the protective coating; the surface shall be re-cleaned at no additional cost to the State.

2. Surface and material temperatures shall be a minimum of 40°F or as recommended by the manufacturer.

3. Material shall be applied by brush, roller or low-pressure spray. The rolling shall be done only on smooth surfaces and at such a pace that no spinning of the roller or throwing off of protective coating material occurs when the roller is lifted from the surface. Coverage rate shall be as recommended by the manufacturer and as approved by the Engineer.

4. The protective coating shall be applied in a uniform manner to evenly coat all pores and textured areas. Extremely textured or porous surfaces will require a second coat. Unless otherwise designated by the Engineer, the protective coating shall be applied from

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column to column, post to post, and from bottom to a height of 8 feet 2.5 for noise barrier wall panels, and from joint to joint or scoremark to scoremark and from bottom to a height of 8 feet for abutments, walls or other surfaces.

5. Avoid high wind and rain, prolonged exposure in summer sunlight, and keep from freezing 12 hours after application.

6. A test panel 5 foot x 5 foot shall be provided and coated to insure suitability, number of coats required, and desired results. The test panel application and results shall be inspected and approved by the Engineer and the Regional Landscape Architect.

7. All work must conform to the OSHA standards referred to in subsection 107-05 of the Standard Specifications.

8. No dilution can happen of dilution or cleaner.

**METHOD OF MEASUREMENT**

This work will be measured by the number of square feet of surface covered with the anti-graffiti coating applied, in accordance with this specification. Test panels prepared under this item will not be measured for payment.

**BASIS OF PAYMENT**

The unit price bid per square foot shall include the cost of furnishing all labor, materials and equipment necessary to prepare the surfaces and apply the coating in accordance with the contract documents and as directed by the Engineer. The cost of providing necessary test panels shall also be included in the price bid for this item.
ITEM 603.95120011 – DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 12 IN DIA (NYC)

ITEM 603.95160011 – DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 16 IN DIA (NYC)

ITEM 603.95180011 – DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 18 IN DIA (NYC)

ITEM 603.95200011 – DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 20 IN DIA (NYC)

ITEM 603.95240011 – DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 24 IN DIA (NYC)

DESCRIPTION

This work shall consist of the construction of ductile iron pipe storm drains in accordance with this specification and the contract plans.

MATERIALS

Ductile iron pipe shall be Class 56 unless otherwise indicated and meet the requirements of ANSI A21.51. Pipe shall be centrifugally cast Ductile Iron Pipe, 60-42-10 grade cement lined in accordance with ANSI A21.51. Laying lengths shall not exceed twenty (20) feet. All inside surfaces of ductile, iron pipes shall be cement lined in accordance with ANSI specification A21.4. All outside surfaces of ductile iron pipe shall be shop-coated with an approved bituminous enamel applied hot in conformity with AWWA specification 203.

Joints shall be of the restrained push-on type and shall be in accordance with ANSI specification A21.11. The joint shall provide a positive axial lock between the two pipe segments joined. For each bell, there shall be furnished a rubber gasket. Restrained push-on joints shall be the TRFlex Joint of U.S. Pipe and Foundry Company, the Flex Ring Joint of the American Cast Iron Company, the Snap Lok Joint of Amstead Industries or approved equal.

Ductile Iron Pipe shall be accepted on the basis of the Manufacturer’s certification that the material conforms to the requirements of this specification. The certification shall accompany the material delivered to the job site.

Broken stone shall be hard, unweathered stone uniformly graded from ¼ inch to 3/4 inch diameter and shall conform to the requirements of Subsection 703-02 of the Standard Specifications (USC Edition).

CONSTRUCTION DETAILS

Pipe shall be laid on a bed of compacted stone for the full trench width to the limits shown on the details of the drawings. Pipe joints shall be restrained push-on type and shall be installed in accordance with the manufacturer’s instructions for assembling pipe. All other requirements of Subsection 603-3 “Construction Details” of the Standard Specifications (USC Edition) shall apply.

METHOD OF MEASUREMENT

The quantities of Ductile Iron Pipe on Crushed Stone Bedding to be measured for payment shall be the number of linear feet of each sized measured horizontally along the center line of sewer from inside face of manhole to inside face of manhole.
ITEM 603.95120011 – DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 12 IN DIA (NYC)
ITEM 603.95160011 – DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 16 IN DIA (NYC)
ITEM 603.95180011 – DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 18 IN DIA (NYC)
ITEM 603.95200011 – DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 20 IN DIA (NYC)
ITEM 603.95240011 – DUCTILE IRON PIPE ON CRUSHED STONE BEDDING, 24 IN DIA (NYC)

BASIS OF PAYMENT

The requirements of Subsection 603-5 “Basis of Payment” of the Standard Specifications (USC Edition) shall apply. The broken stone bedding shall be paid for separately under Item 623.13 Crushed Stone.
DESCRIPTION: This work shall consist of the construction of Catch Basins - Type 1, Type 2 and Type 3 (New York City) at the locations shown on the plans or as directed by the Engineer.

MATERIALS: Section 604-2.01 of the Standard Specifications shall apply with the following modifications and an addition: Catch Basins shall be built of Cast-in-Place Concrete - Class A or rectangular Precast Reinforced Concrete Manhole Units.

CONSTRUCTION DETAILS: Section 604-3.01, 3.02, 3.05 and 3.11 of the Standard Specifications shall apply. Catch Basins - Type 1, Type 2 and Type 3 shall be as shown on New York City Department of Water Resources Drawings T71, T72 and New York City Department of Environmental Protection Drawing 42, respectively, except that concrete cradles and encasement for pipes will not be required.

METHOD OF MEASUREMENT: Section 604-4.01 of the Standard Specifications shall apply.

BASIS OF PAYMENT: Section 604-5 of the Standard Specifications shall apply with the following additions:
A. Hooks and Hoods. Hooks and Hoods, when called for on the plans, will be paid for separately.
B. Plugging Pipes. The cost of all materials and labor necessary to plug pipe as called for on the plans shall be included in the price bid for "Plugging Pipes and Conduits."
DESCRIPTION
This work shall consist of the construction of 4 Foot Diameter Precast Manholes (NYC) at the locations shown on the plans or as directed by the Engineer.

MATERIALS
Section 604-2.01 of the Standard Specifications shall apply with the following modification and or addition:
Manholes shall be built of circular Precast Reinforced Class “A” Concrete Manhole Units.

CONSTRUCTION DETAILS
Section 604-3.01, 3.02, 3.05 and 3.11 of the Standard Specifications shall apply.
Manholes shall be as shown on the following New York City Department of Environmental Protection SEWER DESIGN STANDARDS, (October 1997 or later).

Page Drawing Description
28A NYC STANDARD FOR 4 FOOT DIAMETER PRECAST MANHOLE
(LOOSE TOP SLAB AND MONOLITHIC BASE SECTION)
28B NYC STANDARD FOR 4 FOOT DIAMETER PRECAST MANHOLE
(MONOLITHIC TOP SECTION AND ALTERNATE LOOSE BOTTOM SLAB)
28C NYC STANDARD FOR 4 FOOT DIAMETER PRECAST MANHOLE
(MISCELLANEOUS DETAIL, NOTES AND SCHEDULE)

METHOD OF MEASUREMENT
The quantity to be paid for will be the number of linear feet of height measured to the nearest tenth of a foot from the bottom of the base to the top of the masonry.

BASIS OF PAYMENT
The unit price bid per linear feet shall include the cost of all labor, equipment and materials necessary to complete the work, except as follows:

A. Necessary excavation will be paid for under Trench and Culvert excavation.
B. Bar reinforcement (except in reinforced concrete pipe and precast reinforced concrete units) will be paid for under Uncoated Bar Reinforcement for Concrete Structures.
C. Frames, covers, and gratings will be paid for under the appropriate items.
D. Temporary sheeting, if necessary, will be paid for under their appropriate items.
DESCRIPTION

This work shall consist of the construction of 5 Foot Diameter Precast Manholes (NYC) at the locations shown on the plans or as directed by the Engineer.

MATERIALS

Section 604-2.01 of the Standard Specifications shall apply with the following modification and or addition:

Manholes shall be built of circular Precast Reinforced Concrete Manhole Units.

CONSTRUCTION DETAILS

Section 604-3.01, 3.02, 3.05 and 3.11 of the Standard Specifications shall apply.

Manholes shall be as shown on the following New York City Department of Environmental Protection SEWER DESIGN STANDARDS, (September 2007 or later).

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<td>29B</td>
<td>NYC STANDARD FOR 5 FOOT DIAMETER PRECAST MANHOLE (MONOLITHIC TOP SECTION AND ALTERNATE LOOSE BOTTOM SLAB)</td>
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<td>29C</td>
<td>NYC STANDARD FOR 5 FOOT DIAMETER PRECAST MANHOLE (MISCELLANEOUS DETAIL, NOTES AND SCHEDULE)</td>
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METHOD OF MEASUREMENT

The quantity to be paid for will be the number of linear feet of height measured to the nearest tenth of a foot from the bottom of the base to the top of the masonry.

BASIS OF PAYMENT

The unit price bid per linear foot shall include the cost of all labor, equipment and materials necessary to complete the work, except as follows:

A. Necessary excavation will be paid for under Trench and Culvert excavation.
B. Bar reinforcement (except in reinforced concrete pipe and precast reinforced concrete units) will be paid for under Uncoated Bar Reinforcement for Concrete Structures.

C. Frames, covers, and gratings will be paid for under the appropriate items.

D. Temporary sheeting, if necessary, will be paid for under their appropriate items.
DESCRIPTION

This work shall consist of the construction of manholes – Type A-1 (NYC) and Drop Pipe Manholes (NYC) at the locations shown on the plans or as directed by the Engineer.

MATERIALS

Section 604-2.01 of the Standard Specifications shall apply with the following modification and an addition:

Manholes shall be built of Cast-in-Place Concrete - Class “A” or rectangular Precast Reinforced Concrete Manhole Units.

CONSTRUCTION DETAILS

Section 604-3.01, 3.02, 3.05 and 3.11 of the Standard Specifications shall apply.

Manholes shall be as shown on the following New York City Department of Environmental Protection SEWER DESIGN STANDARDS (September 2007 or later).

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METHOD OF MEASUREMENT

The quantity to be paid for will be the number of linear feet of height measured to the nearest tenth of a foot from the bottom of the base to the top of the masonry.
The unit price bid per linear foot shall include the cost of all labor, equipment and materials necessary to complete the work, except as follows:

A. Necessary excavation will be paid for under Trench and Culvert excavation.

B. Bar reinforcement (except in reinforced concrete pipe and precast reinforced concrete units) will be paid for under Uncoated Bar Reinforcement for Concrete Structures.

C. Frames, covers, and gratings will be paid for under the appropriate items.

D. Safe operation and temporary steel sheet piling, if necessary, will be paid for under their appropriate items.
ITEM 604.04890011 – NYC STANDARD MANHOLE TYPE A-3

DESCRIPTION

This work shall consist of the construction of manholes – Type A-3 (NYC) at the locations shown on the plans or as directed by the Engineer.

MATERIALS

Section 604-2.01 of the Standard Specifications shall apply with the following modification and addition:

Manholes shall be built of Cast-in-Place Concrete - Class “A” or rectangular Precast Reinforced Concrete Manhole Units.

CONSTRUCTION DETAILS

Section 604-3.01, 3.02, 3.05 and 3.11 of the Standard Specifications shall apply.

Manholes shall be as shown on the following New York City Department of Environmental Protection SEWER DESIGN STANDARDS (September 2007 or later).

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<tr>
<td>13</td>
<td>STANDARD FOR SHALLOW MANHOLE ON 8 INCH DIA TO 30 INCH DIA PIPE SEWERS, TYPE A-3 (LESS THAN 4’-0” COVER)</td>
</tr>
<tr>
<td>35</td>
<td>STANDARD FOR REMOVABLE PRECAST REINFORCED CONCRETE SLAB</td>
</tr>
</tbody>
</table>

METHOD OF MEASUREMENT

The quantity to be paid for will be the number of linear feet of height measured to the nearest tenth of a foot from the bottom of the base to the top of the masonry.

BASIS OF PAYMENT

The unit price bid per linear foot shall include the cost of all labor, equipment and materials necessary to complete the work, except as follows:

A. Necessary excavation will be paid for under Trench and Culvert excavation.

B. Bar reinforcement (except in reinforced concrete pipe and precast reinforced concrete units) will be paid for under Uncoated Bar Reinforcement for Concrete Structures.

C. Frames, covers, and gratings will be paid for under the appropriate items.

D. Safe operation and temporary steel sheet piling, if necessary, will be paid for under their appropriate items.
ITEM 607.7XXYYN39 – STEEL FENCE AND GATE– NYCDPR

DESCRIPTION.
This work will consist of the fabrication, installation, and painting of steel fences, gates, handrail and metal tree pit guard as described, and at the locations indicated in the contract documents, and as directed by the Engineer.

Gate(s) shall include Park Leaf (for double gates), gate posts and all associated hardware (lock bolt, padlock, gate stop, gate latch, galvanized steel chain, hinges, etc.).

MATERIALS.
The following sections of the standard specifications shall apply:

Concrete Grouting and Anchoring Material 701-05
Steel Castings 715-02
Iron Castings 715-05
Steel Forging 715-06
Malleable Iron Casting 715-09
High Strength Bolts, Nuts and Washers 715-14

with the following modifications:

§715-02 Steel Casting – Unless otherwise specified, all steel castings shall be Grade 65-35, fully annealed. Test specimens shall show a fracture having a silky or fine granular structure throughout, easily machined and meet all chemical and physical requirements of this specification. Casting shall be true to pattern, free from cracks, gas holes, flaws and excessive shrinkage. Large castings, if required, shall be suspended and hammered all over. No cracks, flaws or other defects shall appear after such treatment. No sharp, unfilleted angles or corners will be allowed. One tension test and one bend test shall be made from each melt in each heat treatment charge and from each casting weighing five hundred pounds or over.


§715-06 Steel Forgings – Structural forgings shall be Class C carbon steel, unless specified otherwise. Machinery forgings shall be Class C carbon steel, Class E carbon steel, or Class H nickel steel, as specified. All forgings shall be thoroughly annealed. The yield point of Class C forgings shall be not less than 33,000 lbs psi. The tensile requirements for forgings from 20 to 30 inches in diameter shall conform to the requirements for forgings 12 to 20 inches in diameter. All forgings shall meet the bend test requirements of paragraph S3, supplementary requirements of ASTM A668.
**ITEM 607.7XXYYN39 – STEEL FENCE AND GATE – NYCDBR**

The following ASTM specifications shall apply:

- Standard Specification for General Requirements for Steel Bars Carbon and Alloy, Hot-Wrought ASTM A29
- Standard Specification for Carbon Structural Steel ASTM A36
- Standard Test Methods for Measuring Adhesion by Tape Test ASTM D3359

**General:** Steel fences, gates and metal tree pit guards shall be constructed of solid bars, posts, and rails of the sizes shown in the contract documents unless specifically noted. All fence, gate and tree pit guard material shall conform to ASTM A36.

Steel handrail shall be steel bar in accordance with ASTM A29 or ASTM A36. All handrail shall be delivered in “assembly ready” condition. No field fitting or cutting will be allowed. Handrail shall be from one of the following manufacturers:

- **Julius Blum & Co., Inc**
  P.O. Box 816
  Carlstadt, NY 07072
  201-438-4600
  [www.juliusblum.com](http://www.juliusblum.com)

- **Architectural Iron Designs**
  P.O. Box 816
  950 South 2nd Street
  Plainfield, NJ 07063
  800-784-7444
  [www.archirondesign.com](http://www.archirondesign.com)

- **The Lawler Foundry**
  P.O. Box 320069
  Birmingham, AL 35232
  800-624-9512
  [www.lawlerfoundry.com](http://www.lawlerfoundry.com)

  or equal as approved by the Engineer.

**Fabrication:** Fences, gates, handrail and metal tree pit guards shall be fabricated in strict accordance with the contract documents and approved shop drawings. Posts and rails shall be formed into panels of the shapes indicated in the contract documents. Panel and handrail joints shall be completely welded with welds of proper size and shape all welds ground smooth to a neat finish with no sharp edges. Connection shall be provided as indicated in the contract documents.

**Welding:** Welding shall be done in accordance with the Standard Welding Procedure Specifications of the American Welding Society. Welding shall be done by the electric arc method or other approved method and the welding operators shall be experienced in this particular class of work. All slag shall be removed from finished welds and they shall show uniform section, smoothness of weld metal, feather edges without overlaps and freedom from porosity and clinkers. Visual inspection at edges and ends of fillets and butt joint welds shall indicate good fusion with, and penetration into, base metals.
ITEM 607.7XXYYN39 – STEEL FENCE AND GATE– NYCDPR

Paint: The fences, gates, handrail and metal tree pit guards shall receive three (3) coats of paint. The first coat shall be shop applied. Refer to the construction details section of the specification for information on preparing the fences, gates and metal tree pit guards for and applying the second and third coats.

Cleaning Treatment: Cleaning treatment shall be performed with a solvent such as mineral spirits, xylol, or turpentine.

First Coat (Shop Applied): The primer shall be a fast drying, 53% - 61% weight solids, low VOC, rust inhibiting, modified alkyd metal primer with a dry film thickness of 1.75 - 5 mils and shall be from one of the following manufacturers:

- Super Spec HP® D.T.M. (direct to metal)
- Alkyd Semi-Gloss P24
- as manufactured by Benjamin Moore & Co.
- 101 Paragon Drive
- Montvale, NJ 07645
- 201.573.9600
- www.benjaminmoore.com

- Kem Bond® HS Metal Primer – B50NZ3
- as manufactured by Sherwin-Williams
- Woodside, NY
- 1.800.524.5979
- www.sherwin-williams.com/protective

or equal as approved by the Engineer.

Paint requires up to two (2) to two and a half (2 ½) hours drying time before recoating (with alkyds).

Second Coat and Third Coats (Field Applied): The topcoat shall be a silicone alkyd, semi or high gloss coating having a dry film thickness of 1.75 - 3 mils and shall be from one of the following manufacturers:

- Super Spec HP® D.T.M. (direct to metal)
- Alkyd Semi-Gloss P24, Safety Black
- as manufactured by Benjamin Moore & Co.
- 101 Paragon Drive
- Montvale, NJ 07645
- 201.573.9600
- www.benjaminmoore.com

- Steel Master 9500 Silicone
- Alkyd Black
- as manufactured by Sherwin Williams Company
- Woodside, NY
- 1.800.524.5979
- www.sherwin-williams.com/protective

or equal as approved by the Engineer.

Paint requires up to thirty (30) hours drying time @ 50°F; up to sixteen (16) to eighteen (18) hours drying time @ 77°F. Paint adhesion shall be 100% retention in accordance with ASTM D3359, classification 5B.
ITEM 607.7XYYN39 – STEEL FENCE AND GATE – NYCDPR

All coats of paint shall be produced by the same manufacturer. Selection of undercoat colors is left to the discretion of the Contractor unless specified otherwise.

Hinges: The Hinges shall a Heavy Duty Steel Ball Bearing Hinge, 5” X 6” from one of the following:

<table>
<thead>
<tr>
<th>Name</th>
<th>Manufacturer</th>
<th>Address</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>#BB855</td>
<td>Heavy Duty Pressed Steel Hinge</td>
<td>Manufactured by Stanley Hardware</td>
<td>800-337-4393</td>
<td><a href="http://www.stanleyhinges.com">www.stanleyhinges.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manufactured by Shannon Fence and Painting</td>
<td>631-254-0314</td>
<td><a href="http://www.shannonfencing.com">www.shannonfencing.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>New Britain, CT 06053</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deer Park, NY 11729</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

or equal as approved by the Engineer

Lock Bolt (Double Gates): Shall be a drop rod bar arranged to engage the gate stop. Locking device shall be constructed so that the drop rod cannot be raised when the gate is locked. The locking bolt and bolt catch hardware shall be constructed as shown in the contract documents. The locking device shall have provisions for a padlock. All necessary fittings and gate holders to lock gates in both open and closed positions shall be furnished. The locking device shall be as manufactured by:

<table>
<thead>
<tr>
<th>Name</th>
<th>Manufacturer</th>
<th>Address</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Locking Device Drop Rod</td>
<td>Drop Rod</td>
<td>Boundary Fence and Railing Systems, Inc</td>
<td>800-377-4393</td>
<td><a href="http://boundaryfence.net">http://boundaryfence.net</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>131-02 Jamaica Ave.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Richmond Hill, NY 11418</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>631-254-0314</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shannon Fence and Painting</td>
<td></td>
<td><a href="http://www.shannonfencing.com">www.shannonfencing.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>900 Long Island Ave.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deer Park, NY 11729</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

or equal as approved by the Engineer.

Gate Stop: The gate stop shall be as shown in the contract documents.

Gate Latch (Single Gates): Shall be a lockable stirrup type. Latch shall be constructed of steel bars and blocks with a stainless steel pin, as shown on the drawings. The ends of stirrups shall be treated with a heavy-duty flexible, rubberized coating.

Padlock: The Contractor shall furnish one padlock for each single gate and each leaf of double gates. All padlocks for the same park facility shall be keyed alike, with 2” wide by 3/4” thick brass body, maximum security, five (5) pin tumblers with hardened alloy steel chrome plated shackle no less than 3/8” diameter and 2” clearance (elongated shackle). The Contractor shall furnish two (2) keys for each padlock.
Galvanized steel chain: A galvanized steel chain, 9” long shall be fastened to the gate and body of the lock. The chain shall be 5/16” by 1-3/8”.

Cast Iron NYCDPR Parks Leaf for Double Gates: The NYCDPR retains exclusive right to the use of the leaf pattern. The Park Leaf casting shall be as manufactured by:

- Wemco Castings, LLC
  - 20 Jules Court, Suite 2
  - Bohemia, NY 11716-4106
  - 631-563-8050
  - www.wemcocastingllc.com

- A&T Ironworks, Inc/ORSOGIL®
  - 25 Cliff Street
  - New Rochelle, NY 10801
  - 800-253-0973
  - www.atironworks.com

or equal as approved by Engineer.

Leaf castings are to be fabricated from Ductile Iron 65-45-12. The small 9 1/2” leaf shall weigh approximately 6 lb. each. The back of the leaf casting is to be flat and the front face shall be contoured with the veins of the leaf shown in relief. See contract documents for structural details.

Park leaves shall be shop welded to each leaf of the steel gate. Field welding will not be permitted.

Grout: Grout for fence posts shall be non-shrink, cement based grout, as manufactured by:

- Master Flow 100
  - BASF Building Systems, Inc
  - 889 Valley Park Drive
  - Shakopee, MN 55379
  - 952-496-6000
  - http://www.buildingsystems.basf.com

- SikaGrout 212
  - Sika Corporation
  - 201 Polito Ave
  - Lyndhurst, NY 07071
  - 800-933-SIKA
  - usa.skia.com

- Five Star High Strength Grout
  - Five Star Products, Inc. 750 Commerce Drive
  - Fairfield, CT 06825
  - 800-243-2206
  - www.fivestarproducts.com/

or equal as approved by the Engineer.
ITEM 607.7XXYN39 – STEEL FENCE AND GATE– NYCDPR

Note: All gypsum (Calcium Sulfate, CaSO4) based grout will be rejected.

Sealant: Sealant around fence post shall be one part polyurethane, elastomeric adhesive as provided by the following:

MasterSeal CR195
as manufactured by
BASF Building Systems, Inc.
889 Valley Park Drive
Shakopee, MN 55379
952-496-6000
http://www.buildingsystems.basf.com

Sikaflex-la
as manufactured by
Sika Corporation
201 Polito Ave
Lyndhurst, NY 07071
800-933-SIKA
usa.skia.com

DynaTred
as manufactured by
Pecora Corporation 165
Wambold Road
Harleysville, PA 19438
800-523-6688
www.pecora.com/

or equal as approved by Engineer.

CONSTRUCTION DETAILS
The following sections of the standard specification shall apply:

Structural Steel Painting: Field Applied – Total Removal 573-3

General: The Contractor shall mark and obtain approval of the proposed fence alignments, gate and/or handrail and/or metal tree pit guards locations prior to proceeding with shop drawings, fabrication, or installation.

Preparation for Painting: Immediately prior to painting, all surfaces of fences, gates, handrails and metal tree pit guards shall be thoroughly free of debris. All surfaces that are rust free shall be treated in accordance with §573 - 3.02 “Surface Preparation” A.2. Solvent Cleaning SP-1. Treatment shall remove all dirt, grease and foreign matter. Surfaces that show evidence of scale and rust shall be cleaned in accordance with SP-2, Hand Tool Cleaning, a method generally confined to wire-brushing, sandpaper, hand scrapers or hand impact tools or SP-3, Power Tool Cleaning, a method generally confined to power wire brushes, impact tools, power sanders, and grinders in order to achieve a sound substrate.
Paint: All paints shall be applied with ambient air temperature is 50°F minimum and rising. No painting shall be allowed below the minimum ambient temperature. Surfaces to be painted shall be moisture free. In addition, no painting will be allowed below the temperature at which moisture will condense on surfaces.

The fences, gates, handrails and metal tree pit guards shall receive three (3) coats of paint. The first coat shall be shop applied; the second and third coats shall be field applied.

Fence and Gate Installation:

General Installation: The Contractor shall erect the fences in holes that have been formed or drilled in concrete or stone footings, curbs, or walls as required by the contract documents. The Contractor shall support each fence or gate post in a manner that will keep it plumb, smoothly aligned with the other posts, and at the elevation required by the contract documents. The annular space surrounding each post shall be filled with the specified non-shrink, cementitious grout. The grout shall be flush with the footing, curb, wall or other foundation. After the grout has cured, the Contractor shall install a sealant around the fence post. The sealant shall be gunned in between the base of the fence post and the footing, curb, wall or other foundation. Application of both the grout and sealant shall be in strict accordance with the manufacturer’s instructions and shall be tooled as required.

Fence and gate rails shall be set at slopes conforming to the slope of the finish grade beneath the fence or gate unless specifically shown otherwise in the contract documents.

Pickets shall be vertical (plumb). Rails, bars and handrails shall be parallel to grade as shown in the contract documents. Panels shall be curved as required by the work. Braces shall be required at two-thirds (2/3) of the way up each post when fence is ten feet (10’) high or over. Connections between panels and posts shall be provided as indicated contract documents.

Any fences and gates not set plumb and true to line and grade shall be removed and replaced at the Contractor’s expense. The Contractor shall maintain the fences and gates during the life of the contract and shall repair replace all members that are disturbed, damaged, or destroyed.

All paint spatters, metal scraps, and metal fillings shall be removed from the site before the work will be accepted.

Double and Single Gate Installation:

- Gates shall include gate posts, locking devices, padlocks and steel chain.
- Each gate installed shall include a padlock with a 9” long galvanized steel chain fastened to the gate and the body of the lock, a lock bolt, and all necessary fittings to hold and lock the gate in both open and closed positions.
- Each single gate installed shall include a lockable stirrup type gate latch.
- Each double gate installed shall include a gate stop. Gate stops shall be provided at the locations indicated in the contract documents or at locations indicated in the field.
ITEM 607.7XXYN39 – STEEL FENCE AND GATE– NYCDPR

Metal Tree Pit Guard:

**General Installation:**
- Tree guards shall be installed three sided leaving the street side open and shall not be embedded into concrete.
- Tree guards shall be set back at least 12 inches from the curb.

**Submittals:**

**Shop Drawings:** The Contractor shall measure the space where the fence, gate, handrail or metal tree pit guard will be located and shall use this information to create accurate shop drawings. A least 15 calendar days prior to starting work and before manufacturing the fence, the Contractor shall submit two (2) sets of shop drawings for approval. If revisions are required, two (2) paper sets of all required revised drawings must be submitted for approval.

**Structural Steel:** The Contractor shall furnish certified copies of the manufacturer’s tests results.

**Foundry Certificate:** A certificate verifying the quality of ductile iron for the Parks Leaf shall be submitted. Certificate shall be on Manufacturers’ letterhead, dated and signed by the company President with Contract Number, Contract Title, Contractor Name, and Class of Ductile Iron provided.

**Samples:** The Contractor shall submit for approval, finished samples of parts of the fence, gate, handrail and/or metal tree pit guard. The workmanship and finish of the final product shall be equal to the approved samples.

If the proposed manufacturer is other than the two listed in this specification, a full sized sample must be submitted for approval for the gate latch (single gate), padlock and cast iron parks leaf.

**Paint Substitution:** A written request for paint substitution must be formally submitted. The Contractor shall submit this request, along with Material Safety Data Sheets (MSDS) for approval, a minimum of two (2) weeks prior to the intended date of paint application. All paint substitutions must be approved in writing prior to use.

**METHOD OF MEASUREMENT**

The work will be measured as the number of feet to the nearest inch of steel fences and/or tree pit guard fabricated, installed and painted.

The work will be measured as the number of each steel gate fabricated, installed and painted.

The work will be measured as the number of linear feet of handrail fabricated, installed and painted.
ITEM 607.7XXYYN39 – STEEL FENCE AND GATE—NYCDPR

BASIS OF PAYMENT

The unit price bid per linear foot of fence and/or tree pit guard fabricated, installed and painted shall include the cost of all labor, materials, and equipment necessary to satisfactorily complete the work.

The unit price bid per each gate, fabricated, painted and installed shall include the cost of all labor, materials, and equipment necessary to satisfactorily complete the work.

The unit price bid per linear foot of handrail fabricated, painted and installed shall include the cost of all labor, materials and equipment necessary to satisfactorily complete the work.

All concrete work, excavation and clearing and grubbing will be paid for separately under their respective items.

Payment will be made under the following items:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>607.70206139</td>
<td>Steel Picket Fence, 2’-6” high - NYCDPR</td>
<td>FT</td>
</tr>
<tr>
<td>607.70400139</td>
<td>Steel Picket Fence, 4’-0” high - NYCDPR</td>
<td>FT</td>
</tr>
<tr>
<td>607.70500139</td>
<td>Steel Picket Fence, 5’-0” High – NYCDPR</td>
<td>FT</td>
</tr>
<tr>
<td>607.70700139</td>
<td>Steel Picket Fence, 7’-0” High - NYCDPR</td>
<td>FT</td>
</tr>
<tr>
<td>607.70206239</td>
<td>Single Steel Picket Gate, 2’-6” high, Opening as Specified – NYCDPR</td>
<td>EA</td>
</tr>
<tr>
<td>607.70400239</td>
<td>Single Steel Picket Gate, 4’-0” high, Opening as Specified – NYCDPR</td>
<td>EA</td>
</tr>
<tr>
<td>607.70500239</td>
<td>Single Steel Picket Gate, 5’-0” High, Opening as Specified – NYCDPR</td>
<td>EA</td>
</tr>
<tr>
<td>607.70700239</td>
<td>Single Steel Picket Gate, 7’-0” High, Opening as Specified – NYCDPR</td>
<td>EA</td>
</tr>
<tr>
<td>607.70400339</td>
<td>Double Steel Picket Gate, 4’-0” high, Opening as Specified – NYCDPR</td>
<td>EA</td>
</tr>
<tr>
<td>607.70500339</td>
<td>Double Steel Picket Gate, 5’-0” High, Opening as Specified – NYCDPR</td>
<td>EA</td>
</tr>
<tr>
<td>607.70700339</td>
<td>Double Steel Picket Gate, 7’-0” High, Opening as Specified – NYCDPR</td>
<td>EA</td>
</tr>
<tr>
<td>607.70000439</td>
<td>Metal Tree Pit Guard</td>
<td>FT</td>
</tr>
<tr>
<td>607.70000539</td>
<td>Handrail</td>
<td>LF</td>
</tr>
</tbody>
</table>

Where:
XXYY is equal to the height of the fence and gate in feet (XX) and inches (YY).
Additional payment items may be required based on the height of the fence/gate required.
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.
ITEM 634.90030011- RODENT AND VERMIN CONTROL - INITIAL SURVEY.
BAITING AND SANITATION

ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE PROGRAM

DESCRIPTION
A. Under these items the Contractor shall perform and satisfy the rodent and vermin control (extermination) and site sanitation requirements within construction areas as designated by the engineer.

B. The contractor shall maintain a cooperative dialogue with appropriate agencies and management representatives of neighborhood properties.

C. The contractor shall perform the rodent and vermin control tasks described herein and also respond to other pest control needs when directed by the Engineer.

MATERIALS
1. Products
   A. Furnish and use only pesticide formulations registered by the U.S Environmental Protection Agency (EPA) and New York State Department of Environmental Conservation (DEC) where appropriate, according to label directions and as acceptable to the Engineer.

   B. Furnish and use devices and supplies (e.g., traps and bait stations) to facilitate the effectiveness and safety of the pest control program as appropriate and as acceptable to the Engineer.

2 Containers
   A. Use heavy duty refuse containers with tight-fitting domed lids, with a spring loaded flap, for disposal of all garbage and trash associated with food. Maintain these containers so there are no opening that allow access by rodents or vermin.

   B. If a dumpster is necessary for the temporary storage of garbage and trash associated with food, it shall not have openings that allow access by rodents or vermin. The dumpster shall have a drain plug if a drain is present, and the doors shall be maintained tightly closed.

CONSTRUCTION DETAILS
This work is to be performed prior to the start of construction and also throughout construction, so that Rodents (rats and mice) and Vermin (cockroaches, beetles, and other insects) do not disperse from or infest construction area or adjacent residential areas.

1. Submittals
ITEM 634.90030011 - RODENT AND VERMIN CONTROL - INITIAL SURVEY.
BAITING AND SANITATION

ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE
PROGRAM

A. Submit to the Engineer copies of pesticide applicators certification and licenses within ten (10) days of their issuance or renewal for the duration of this Contract.

B. After performing the survey described under Construction Details Section 6 and before initiating baiting, submit to the Engineer a written description of proposed pest control procedures, indicating materials, quantities, methods, and time schedule. For all pesticide be used, submit a copy of pesticide manufacture’s EPA- approved pesticide label with application directions.

C. Submits to the Engineer documentation of pest control activities and results as follows:
   1. Monthly - Submits data sheets with location of sites treated, methods and data application, amounts and types of bait used, pesticides dosage, number and types of traps set, survey and inspection results, sanitation condition complaints calls investigated, any problems that occurred and signature of applicator.
   2. Monthly — submit a map that shows bait station, manholes and catch basins where baits are being maintained.

D. At least 10 days prior to occupancy of Contract area, submit to the Engineer for review a written description of the sanitation procedures to be used.

2. Qualifications:
   A. The Contractor shall perform this work at all times in accordance with the following minimum standards and as acceptable to the Engineer.

   B. The Contractor, key personnel and applicator shall have experience and/or training in vertebrate pest management and integrated pest management; have experience with various rodent and vermin control techniques, equipment, and strategies; and have knowledge of and experience with techniques to reduce non-targets hazards.

   C. Applicators shall be licensed and certified by New York State DEC.

3. Coordination:
   A. The contractor shall not proceed with the construction designated on the Plans until written release is issued by the Engineers, after successful completion of the initial phase of rodent and vermin control.

   B. Initiate the work before field mobilization begins for the construction designated on the Plans and within adequate timing to achieve control before
ITEM 634.90030011 - RODENT AND VERMIN CONTROL - INITIAL SURVEY.
BAITING AND SANITATION

ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE PROGRAM

environmental disruption and site work. Provide a maintenance program until
construction is completed and all equipment and materials are removed, as
determined by the Engineer.

C. Perform this work in such a manner and post warning signs such that toxicants
or other control tools do not pose hazards to persons, domestic animals, or non-
targets wildlife.

4. Permits:

A. Obtain and maintain in coordination with the Engineer appropriate(s) from city or state agencies for pest control activities associated with this work.

B. Obtain and maintain in coordination with the Engineer all right of entry permits required for the performance of this work. This includes all utilities and private properties to which entrance is required.

5. Meetings:

A. Before proceeding with the work, all pest control personnel shall attend a two hour orientation session held by the Engineer and discuss planned pest control methods and coordination.

6. Survey:

A. Prior to baiting, survey the proposed construction area with representatives of adjacent buildings and record signs of rodent and vermin activity and sanitation conditions. Maintain survey in the manner described under Construction Details Section 10.

B. Thoroughly inspect construction areas and accessible or observable bordering area designated herein, and any nearby area designated by the Engineers, for rodent and vermin activity and sanitation deficiencies monthly throughout the duration of this contract and in accordance with the work schedule. Maintain inspection records in the manner described under Construction Details Section 10.

7. Application for Rodent and Vermin Control:

A. Apply rodenticide and insecticide in strict accordance with EPA-approved label directions and NYSDEC and NYCDEP regulations. Maintain records of all bait placements in the manner described under Construction Details Section 10.

B. Where appropriate, use properly secured and tamper-resistant bait stations consistent with EPA regulations, Remove manhole covers and ventilate manholes according to requirements of appropriate municipal agencies and
ITEM 634.90030011 - RODENT AND VERMIN CONTROL - INITIAL SURVEY.
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ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE PROGRAM

utility companies. Use a police, or utilities details as appropriate. Coordinate the work with appropriate municipal agencies and utility companies. Individually number and property identify all bait stations.

C. Baited area must be posted with warning signs advising the public that bait has been placed in the area. The signs are to be large (18 inches X 22 inches) and clearly printed at all baits stations.

D. Surface Applications

1. Initial Surface Baiting

Rid the construction area of all detectable rodents and vermin before construction begins, as acceptable to the Engineer. Bait all observable rodent burrows and areas of vermin infestation. Install and secure bait stations at regular and appropriate intervals and locations, and document rodent or vermin activity (burrows, dropping, bait consumed, dead rodents). Replenish bait and shift stations as necessary to ensure complete control of rodent and vermin populations. Bait edge and accessible bordering areas designated on the Plans as necessary to ensure that rodents and vermin shall not infest work areas.

2. Maintenance Surface Baiting

Establish a maintenance baiting program prior to the start of construction. This includes construction areas and accessible bordering areas designated herein, as acceptable to the Engineer. Check bait placements weekly. Use survey and baiting data to determine the most effective distribution of baiting locations and bait quantities. Shift and distribute bait and bait stations as appropriate to ensure continuous control.

E. Subsurface Applications

1. Initial Subsurface baiting

Apply appropriate baits to control rodent and vermin populations in manholes and catch basins, This shall involve suspending and securing bait using noncorrosive wire (e.g., 24 gauge plastic coated). Place bait in all accessible manholes and catch basins within the construction work area. In addition, bait an appropriate set of manholes and catch basins in the blocks bordering the work area as designated herein and as acceptable to the Engineer. Identify all baited manholes and catch basins with a standardized paint mark on the street and, a numbered tag to be
attached to the suspending wire. Approximately seven days after completion of the first baiting, check all manhole and catch basin baits and record estimates on the amount of bait consumed. Replenish or increase the amount of bait applied according to the amount consumed and as acceptable to the Engineer. Repeat this process again approximately fourteen days later and until there is little or no bait consumed. Check manholes and catch basins weekly when they repeatedly have 100 percent of the bait consumed.

2. Maintenance Subsurface Baiting

Prior to the start the construction, establish a maintenance baiting program appropriate for the rodent or vermin infestation patterns identified during initial program appropriate for the rodent or vermin infestation patterns identified during initial subsurface baiting. This program shall ensure continued control and shall be performed acceptable to the Engineer. Maintain bait in manholes and catch basins that have rodent or vermin activity and those that had activity during initial baiting as necessary. Check each bait weekly or more often according to rodent or vermin activity levels and the recent history of bait consumption. Use utility maps and baiting data to determine the most effective distribution of baiting locations and bait quantities. Shift and distribute bailing locations as necessary to ensure adequate interception option points for controlling immigrating rodents or vermin.

F. Cleanup

1. Remove visible rodent carcasses and dispose of them daily consistent with the pesticide label directions and applicable codes, laws, and regulations.

2. Upon completion of any pest control operations at the site, remove remaining bait and dispose of it according to the pesticide label and applicable codes, laws, and regulations. Also remove all wires used for subsurface baiting and any bait stations or traps.

8. Sanitation:

Prior to construction and throughout the duration of this Contract, identify and document harborage and food sources available to rodents on the construction site and in observable bordering areas designated herein. This includes any littering or improper or insufficient use of trash receptacles in construction or structural deficiencies that violate City or State sanitation codes.
ITEM 634.90030011 - RODENT AND VERMIN CONTROL - INITIAL SURVEY.
BAITING AND SANITATION

ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE PROGRAM

Maintain records of sanitation conditions in the manner described under Construction Details Section 10.

A. Maintain Construction and laydown areas and their perimeters free of trash, garbage, weeds, debris and unnecessary or deteriorated hay and straw bales. Provide and enforce proper use of refuse containers to ensure that rodents and other pests are not harbored or attracted.

B. Designate specific locations as lunch and coffee break areas to prevent random disposal of garbage and trash. Keep those areas free of litter and garbage, and provide refuse containers. Keep refuse containers upright with their lids shut tight.

C. Have all refuse containers (described in Materials Section 2), emptied daily to maintain site sanitation. If a dumpster is used (as described in Materials Section 2) empty it at least weekly and keep the area under and around it clean.

D. Notify the Engineer within 24 hours whenever rodents (rats or mice) or signs of rodent activity (burrows or droppings) or vermin are observed in construction or laydown areas.

9. Complaint Calls

A. During construction, respond to pest-related complaints from the adjacent neighborhood within 12 hours when directed by Engineer. Inspect the particular premises and adjacent areas for sanitation and structural deficiencies and also signs of historic and recent pest activity. Provide sanitation and structural maintenance information to the property owner or manager. Use pesticides or traps as necessary and appropriate to resolve the complaint when there is a relationship between the pest infestation and construction activities, or when directed by the Engineer.

B. Maintain records of all complaints investigated, including location, contact person, inspection results, and actions taken. Document the relatedness of the pest infestation to construction activities.

10. Record Keeping

A. Use standard data sheets provided or approved by the Engineer to maintain accurate records of date, placement, type, and amount of pesticides or other control tools (e.g., traps) applied. Similarly, maintain records of surveys, inspection, changes in pest activity, sanitation conditions, or when directed by the Engineer.
ITEM 634.90030011 - RODENT AND VERMIN CONTROL - INITIAL SURVEY, BAITING AND SANITATION

ITEM 634.90040011 - RODENT AND VERMIN CONTROL - MAINTENANCE PROGRAM

METHOD OF MEASUREMENT

The quantity to be paid for under the item Initial Survey, Baiting and Sanitation, will be on a lump sum basis for the initial work completed in accordance with the plans, specifications and direction of the Engineer.

The quantity to be paid for under the item, Maintenance Program, will be on a per month basis for the maintenance program completed in accordance with the plans, specifications and direction of the Engineer.

Extermination work to be performed under Item 202.0lnnnn - Disposal of Buildings will be measured and paid for under Item 202.01nnnn - Disposal of Buildings.

BASIS OF PAYMENT

The lump sum price bid for the item, Initial Survey, Baiting and Sanitation, shall cover the cost of all labor, material and equipment necessary to complete the initial survey, planning, documentation, baiting and inspection of the construction and adjacent areas both surface and subsurface as well as sanitation inspection, documentation and corrective measures.

The unit price bid per month for the item, Maintenance Program, shall cover the cost of all labor, materials and equipment necessary to complete the weekly inspections, rebaiting, cleanup and rodent and vermin control documentation, garbage disposal cleanup and sanitation documentation as well as to receive, document and respond to complaints.
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:

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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.
### Payment will be made under:

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**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 637.4000nn20 - WEBCAM SYSTEM

DESCRIPTION
This work shall consist of providing, installing, maintaining and removing a webcam system, with a camera mounted on wood utility pole. A single website for image storage and online access may be used for multiple cameras, provided the images are organized and available for each camera separately.

MATERIALS
The webcam system shall meet the following material requirements:

Camera
- The high definition camera and lens assembly shall take high resolution (minimum 16 megapixel - 4928 x 3264) digital still color images and have digital pan, tilt, and zoom capabilities
- Imager: 23.6 X 15.6 CMOS.
- Auto Features: Focus, Shutter, ISO, and white balance.
- Powered by 120 VAC electrical supply, GFCI protected (provided, installed, maintained and removed by Contractor).

Camera Enclosure
- The camera enclosure shall be UL compliant and shall meet NEMA Type 3R standards.
- Include provisions for a fixed installation to a pole or wall.
- Shall include a thermal insulation package, heater, blower, window defroster kit, sun shroud and shall operate within a minimum temperature range of -10°F to 110°F.
- Powered by 120 VAC electrical supply, GFCI protected (provided, installed, maintained and removed by Contractor).

Interface and Online Access
- The system must provide wireless cellular modem as an option for uploading the digital still images.
- The online interface system shall allow viewing of all high-definition digital still images captured and stored during the duration of the contract over the internet with password-protection.
- The still images shall be in a non-proprietary format that can be freely viewed with most image viewing software (.bmp, .jpeg, .tif or .gif)
- Navigation: Calendar based navigation system for selecting specific images on specific days.
- Capable of viewing actual live video.
- HD Snapshot on Demand: HDR (High Dynamic Range) Imaging and Additional Special Effects Including Architectural Miniature, Artistic Color Sketch and Cinematic Black & White
- Graphical mark-up tools for detailing and creating overlays on images.
- Graphical weather applet displaying ten points of local weather data and 48-hour forecast.
- Remote cellular monitoring screen displaying connectivity, network traffic and modem temperature.
- Remote wireless radio monitoring screen displaying connectivity, network traffic and Google Map features including wireless radio locations.
- Image Comparison: Capability to choose and overlay images from two different dates in the same viewing window
- Zoom: Pan and zoom capability for zooming into the high definition images.
- Fullscreen: Screen maximizing the view of the images on the users monitor.
- Slideshow: Capability to browse through images, moving forward and backward in time by individual image and by day.
- Picture in Picture to view live video, while viewing high definition images.
ITEM 637.4000nn20 - WEBCAM SYSTEM

- All Images are the Copyright of the Department and Protected on Secure Servers Owned and Operated by the System Vendor.

Embedded Wood Utility Pole
- The pole shall me a minimum 60 feet in length, Southern pine and meet the requirements of ANSI #05.01 for Class 4 utility type poles.
- The pole shall be given a water borne preservative treatment in accordance with §708-31.

CONSTRUCTION DETAILS
The Contractor shall provide, install and maintain a fully functional webcam system including an electrical power supply, camera hardware, mounting pole and equipment, data connections, image storage, online interface for the system and technical support. The Contractor is required to have the webcam system’s vendor made available for support services and equipment maintenance/repairs.

The Contractor shall provide, install, maintain and remove the webcam system. The Contractor shall coordinate with the Engineer to install the camera in an approved location and provide password access to the webcam system’s Internet site. The camera shall be installed so that the position of the sun or any man-made light source does not point directly into the camera. The camera shall be tested at the site both prior to and subsequent to installation, including having the webcam system’s vendor remotely confirm both successful tests. The Contractor shall clean the installed components in accordance with manufacturer’s recommendations at least monthly, or as needed to ensure image clarity.

The pole shall be installed plumb, in a hole of sufficient depth to allow for a minimum of 10 feet embedment. The area around the pole shall be backfilled with suitable material and thoroughly compacted. The Contractor shall restore, in kind, all areas which were disturbed by the pole installation operation.

The webcam system shall consist of all-weather, tamper/impact resistant, fixed mounted camera enclosure with integrated, fixed high definition camera. The camera shall have the ability to take a high-resolution digital still color image of the construction site at a set time interval, as least every fifteen (15) minutes, and securely upload the still images to a secure, password-protected website. The image data shall at all times be the property of the State. The digital still images shall be stored on a remote server (with sufficient storage capacity to store all images taken on the contract) and be made available for viewing on the website in chronological order. The website shall provide the ability to zoom in on the images. Password access to the website shall be granted to those parties specified by the Engineer (Department staff and the Contractor, at a minimum). The Contractor shall provide the Department with an archive in DVD or external hard drive format of all the digital still images in a sortable/identifiable format. The still image file names shall include the date and time taken.

The Contractor shall maintain all equipment in working condition and shall provide replacement due to breakdown, damage, or theft within two (2) work days. The Contractor’s webcam system vendor shall proactively monitor the webcam system and if no system connection is made within normal working hours, not to exceed 24 hours, the vendor shall notify the Contractor and begin troubleshooting.

The Contractor shall remove all webcam system equipment and wood utility pole within ten (10) work days after the Engineer requests the removal in writing. The webcam system equipment and pole shall remain the property of the Contractor. The State shall retain ownership of all data collected by the webcam system.

The webcam system shall be operated in accordance with the “Policy for the Operation of Webcam Systems on Construction Contracts”, a copy of which will be provided to the Contractor by the Engineer.
ITEM 637.4000nn20 - WEBCAM SYSTEM

METHOD OF MEASUREMENT
The webcam system 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 for the webcam system shall include the cost of all labor, materials and equipment, including services to provide, install, maintain and remove all components of the webcam system and wood utility pole. A deduction of 1/30 of a month will be made for each 24-hour period, or portion thereof during which the webcam system is not operational. Payment will begin the first month the webcam system is installed, operational and made available for use, including having the website established and functional. Monthly payments will be terminated no later than two (2) weeks after written notification by the Engineer that the webcam system will no longer be required.
ITEM 655.00XX0011 - CAST FRAMES AND GRATES AND MANHOLE COVERS

DESCRIPTION
This work shall consist of furnishing and installing Cast Frames and Grates and Manhole Covers, in accordance with the contract documents and as directed by the Engineer.

MATERIALS
All the provisions of §655-2.01 Castings shall apply, and in addition, the requirements shown on the following drawings shall also apply:

REGION 11 DESIGN GUIDE SHEET, DRAINAGE DETAILS, FRAMES, GRATES & STEPS
REGION 11 DESIGN GUIDE SHEET, DRAINAGE DETAILS, FRAME WITH CURB BOX

N.Y.C. DEPARTMENT OF ENVIRONMENTAL PROTECTION, SEWER DESIGN STANDARDS,
• STANDARD FOR 27” DIAMETER CAST IRON FRAME AND MANHOLE COVER
• STANDARD FOR CAST IRON FRAME FOR CATCH BASINS (WITH CURB PIECE)
• STANDARD FOR CAST IRON GRATING, BACK PLATE, AND CURB PIECE FOR CATCH BASINS

N.Y.C. DEPARTMENT OF PARKS AND RECREATION, STANDARD DETAILS,
• DRAINAGE DETAILS – NO. 1
• PARKS LEAF MANHOLE AND CATCH BASIN COVERS

CONSTRUCTION DETAILS
All the provisions of §655-3 CONSTRUCTION DETAILS shall apply, and in addition, the requirements shown on the appropriate New York City drawings shall also apply.

METHOD OF MEASUREMENT
This work will be measured as the number of Cast Frames and Grates, or Cast Frames and Manhole Covers, satisfactorily furnished and installed.

BASIS OF PAYMENT
The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work, including the cost of any field repair work for improperly fitting castings, or to render the frame and grate non-rocking.

Payment will be made under:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>655.00010011</td>
<td>Cast Frame for Catch Basin (Region 11)</td>
<td>Each</td>
</tr>
<tr>
<td>655.00020011</td>
<td>Cast Frame and Curb Box for Catch Basin (Region 11)</td>
<td>Each</td>
</tr>
<tr>
<td>655.00030011</td>
<td>Cast Grate for Catch Basin (Region 11)</td>
<td>Each</td>
</tr>
<tr>
<td>655.00040011</td>
<td>Cast Grate for Catch Basin (NYCDEP)</td>
<td>Each</td>
</tr>
<tr>
<td>655.00050011</td>
<td>Cast Frame for Manhole (NYCDEP)</td>
<td>Each</td>
</tr>
<tr>
<td>655.00060011</td>
<td>Cast Cover for Manhole (NYCDEP)</td>
<td>Each</td>
</tr>
<tr>
<td>655.00070011</td>
<td>Rectangular Cast Frame for Catch Basin (NYCDPR)</td>
<td>Each</td>
</tr>
<tr>
<td>655.00080011</td>
<td>Cast Grate for Catch Basin(NYCDPR)</td>
<td>Each</td>
</tr>
<tr>
<td>655.00090011</td>
<td>Cast Grate for Catch Basin(NYCDPR, ADA)</td>
<td>Each</td>
</tr>
<tr>
<td>655.00100011</td>
<td>Round Cast Frame for Manhole or Catch basin (NYCDPR)</td>
<td>Each</td>
</tr>
<tr>
<td>655.00110011</td>
<td>Cast Cover for Manhole (NYCDPR)</td>
<td>Each</td>
</tr>
</tbody>
</table>
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 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 800.1000NN15 – DESIGN BUILD – UTILITY RELATED WORK**

**DESCRIPTION.** This work shall consist of utility related work in accordance with the contract documents or owner requirements. The “owner” of each utility is identified in the contract documents.

**MATERIALS.** Materials shall be as specified in the contract documents or owner requirements. If none specified, then the proposed material shall be approved by the Engineer of Record before any purchase is made.

**CONSTRUCTION DETAILS.** The Design Builder shall perform all utility related work in accordance with the requirements in the contract documents or owner requirements. In case of a conflict with owner requirements, the owner requirements shall take precedence.

**METHOD OF MEASUREMENT.** Design Build – Utility Related Work as defined in the contract documents will be measured for payment on a fixed price lump sum basis for each utility. The individual utilities will be identified in the contract documents.

**BASIS OF PAYMENT.** The fixed price lump sum for Design Build – Utility Related Work shall include the cost of furnishing all labor, materials, equipment, design, construction inspection, testing, and supervision to satisfactorily complete the work. Progress payments will be made for each utility work in accordance with the contract documents.

**FIXED PRICE ITEM**

The fixed price shown in the proposal for this pay item is not to be altered in any manner by the Proposer. Should the amount be altered, the new figure will be disregarded and the original price will be used to determine the total amount bid for the Contract.

Note: NN in pay item number denotes serialization by each utility.