ALGONKIAN REGIONAL PARK
WOODLANDS ENTRANCE RENOVATIONS

47001 Fairway Drive
Sterling, VA 20165

PROJECT MANUAL

July 3, 2018

NOVA Parks

Northern Virginia Regional Park Authority
5400 Ox Road
Fairfax Station, VA 22039

CONTENTS

INVITATION TO BID
ALGONKIAN REGIONAL PARK
WOODLANDS ENTRANCE RENOVATIONS

Sealed bids will be received by mail or in person at the Northern Virginia Regional Park Authority Headquarters, 5400 Ox Road, Fairfax Station, Virginia 22039, until **Wednesday, August 29, 2018 at 1:00 p.m. EST.** Bids will be opened in public at that time.

This project includes major renovations to the entrance area of the Woodlands Event Center and relocation of the entrance drive to include removal of existing hardscape, landscape and fencing, installation of new roadway and walkways, new free standing concrete and masonry walls and landscaping along with storm water management and miscellaneous associated work as indicated on the drawings. The contractor shall furnish all equipment, material and labor in accordance with the project manual, project specifications and plans.

Five percent bid bond or certified check required for all bids over $500,000. Bid bonds shall be 5% of the total sum of the Base Bid and all alternates. All bids and bid bonds shall remain valid for ninety days. Performance and Labor and Material Payment bonds shall be required of the successful bidder for all contracts awarded over $500,000.

Questions concerning this project shall be directed to Jake Bumbrey, Construction Supervisor. All questions regarding the project or bid shall be in writing and can be sent via email to jbumbrey@nvrpa.org.

The Project Manual and the Project Plans (and any future addenda) can be downloaded from the NOVA Parks website (www.nvrpa.org) at https://www.novaparks.com/about/bids-proposals.

The Contractor shall be responsible to verify and obtain any addenda prior to the bid date. Project Addenda will be posted on the NOVA Parks website listed above as well as emailed to all registered bidders. The Project documents include the following:

- Project Manual dated July 3, 2018
- SPAM-2017-0089 Plans by Paciulli Simmons & Associates – Sheets 1 through 24 approved January 30, 2018
- Plans by LSG Landscape Architecture for Bid – Sheets L101-L102 and L301-L306 dated August 8, 2018

All interested Bidders should formally register with the Northern Virginia Regional Park Authority by contacting Diane Creasey via email at dcreasey@nvrpa.org. Bidders shall provide Ms. Creasey with the following information:

Company Name and Address
Contact Person
Email Address
Phone and Fax Numbers

FORM OF PROPOSAL - PAGE 1 OF 2
ALGONKIAN REGIONAL PARK
WOODLANDS ENTRANCE RENOVATIONS

PROPOSAL

To furnish all material, labor, tools, equipment and supplies to perform all work specified herein and shown in the contract documents.

Name of Bidder: _____

Address of Bidder: _____

_____

_____

Signature /Title: _____

Print Name: _____

Date: _____

Virginia Contractor's License Number: _____

Telephone Number: _____

To: Brian Nolan, Director of Planning and Development
NOVA Parks
5400 Ox Road
Fairfax Station, Virginia 22039
(703) 352-5900

Pursuant to and in compliance with the contract documents, the undersigned proposes and agrees, if this proposal is accepted, to furnish all labor, materials, supplies, equipment and other facilities, and to perform all work described in the project manual in the manner therein prescribed for consideration of the following amounts.

The low bidder shall be determined by the sum of the Base Bid and whichever Alternates are chosen by the Park Authority. Bidders shall fill in all blank spaces on the Form of Proposal.

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BASE BID: All work as described in the project manual, and all work shown on plans related to the area shown as **site #2 on sheet #4, excluding Add Alternate #3 items.**

_____**Dollars / $_____**

ADD ALTERNATE #1: All work as described in the project manual, and all work shown on plans related to the area shown as **site #1 on sheet #4.**

_____**Dollars / $_____**

ADD ALTERNATE #2: Removing gravel in existing storage parking lot.

_____**Dollars / $_____**

ADD ALTERNATE #3: All work shown on plans related to the installation of Arbor 1, Arbor 2 and Pergola as shown on LSG Plan Sheets L302, L304 and L305.

_____**Dollars / $_____**

Unit Price for Unsuitable Soils: Should poor soils be encountered at proposed subgrade and warrant removal, the contractor agrees to remove and dispose of poor soils off site and replace excavated area with properly compacted VDOT 21-A stone at the following total cost per cubic yard:

$_____ / CUYD

Acknowledges Receipt of Addendum #_____dated_____.

Acknowledges Receipt of Addendum #_____dated_____.

Acknowledges Receipt of Addendum #_____dated_____.

SUPPLEMENTAL GENERAL CONDITIONS

All bidders shall submit their bids on the Form of Proposal.

The Owner reserves the right to disqualify any bidders who are determined not to have adequate experience or favorable client references. Any bidder disqualifications shall be at the sole discretion of NOVA Parks.

The Contractor shall repair all miscellaneous damages caused to park property by his forces.

Contractor shall contact Miss Utility to locate public utilities and shall be responsible for any damages caused by their forces to marked utilities.

Contractor shall be responsible for locating the private utilities not shown on the plans and any damages they cause to marked utilities. NOVA Parks' staff will assist with helping to identify these private utilities.

Contractor should verify lengths and conditions and provide bids that reflect actual lengths and conditions.

The Contractor shall be responsible for meeting all VDOT and any other government requirements regarding construction traffic utilizing their roadways and entrances to the project.

All survey and stake out service shall be provided by the Contractor. NOVA Parks will provide the electronic cad files for use by the Contractor. The Contractor shall also complete a **surveyor certified as-built drawing** at the completion of the project as well as provide 3 plan sets and one electronic set of the as-builts to NOVA Parks.

Third party construction testing and inspection shall be provided by NOVA Parks, but must be scheduled and coordinated by the Contractor. All work must be ready for inspection when the testing agent arrives. The contractor may perform their own preliminary testing at their option. The contractor shall schedule all inspections with the designated NOVA Parks' representative at least 24 hours in advance.

On site work shall begin on November 1, 2018 and must be completed by March 15, 2019. If the work is not completed within the time required, as that time may be adjusted by change orders, there shall be imposed on the contractor liquidated damages of $1,000.00 per calendar day for each day beyond the contract time it takes to complete the work.

If adverse weather conditions are the basis for a claim for additional time, such claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, **could not have been reasonably anticipated** and had an adverse effect on the scheduled construction.

It shall be the sole discretion of NOVA Parks whether or not the weather had an adverse effect on the scheduled Construction.

Contractor must notify NOVA Parks immediately of any changes to the approved schedule. Such changes shall be subject to the prior written approval of NOVA Parks.

Submittals shall be required for all construction materials. Three copies shall be submitted to the Park Authority at least seven days prior to delivery and use of the material or product at the site. The Park Authority shall review submittals within four days. If the submittal is rejected, the contractor shall resubmit as required and delay delivery and use of the material or product until the submittal is approved. This delay shall not be cause for an extension of the contract completion date.

The contractor shall take whatever precautions necessary to ensure that the public does not drive or ride on the uncured asphalt. In the event this happens or the surfaces are marred for whatever reason, the contractor shall be responsible for repairs as directed by NOVA Parks.

The Owner will obtain the Site Plan, Building Permit and Grading Permits from Loudoun County. The Contractor shall obtain all other permits necessary and arrange for all governmental inspections as required to include local, state, regional and national inspections as specified in the contract documents.

No work shall be permitted on weekends or holidays unless approved by NOVA Parks. No work shall begin before 7:00 a.m. and all work shall be completed by 6:00 p.m.

Materials may be stored on site with prior approval from NOVA Parks. Only materials and equipment to be used on this project may be stored on site.

No excavations shall be left open overnight unless they are properly barricaded to protect the public and park staff.

The Contractor shall be responsible for importing any soil or gravel materials needed to construct the project per the approved site plan.

The Contractor shall be responsible for off-site disposal of any excess soil materials, trash and debris generated during the course of the project. If a dumpster is used, its location shall be coordinated with NOVA Parks.

DESCRIPTION OF BASE BID AND ALTERNATES

BASE BID

The base bid includes all work indicated on plans in the area of the Woodlands Facility to include asphalt, demo work, landscaping, concrete, stone veneer entrance feature and any other associated work in the area noted in the area of **Site #2, excluding items from Add Alternate 3.**

ADD ALTERNATE #1

Add Alternate #1 includes all work indicated on plans to include walking trail, culverts, RV Storage lot and any other associated work in the area noted as **Site #1.**

ADD ALTERNATE #2
Add Alternate #3 includes price to remove gravel in existing RV Storage parking lot.

ADD ALTERNATE #3
Add Alternate #3 includes price to install pergola, arbor 2 and arbor 1 (on top of masonry piers for entrance feature) from LSG Plan sheet L302, L304 and L305.

Unit Price for Poor Soils
Should unsuitable soils be encountered, the contractor will remove and properly dispose of the materials off site and replace with VDOT 21-A stone compacted as per the project specifications. The unit price is cost per Cubic Yard to remove and dispose of the soils and to properly install the stone including all labor, material, equipment and overhead.

*******END OF SUPPLEMENTAL GENERAL CONDITIONS*******

SECTION 12 93 00 - SITE FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Container Planters.
   2. Bollards.
   3. Fire Pit
   4. Sectional Chair
   5. Umbrella

B. Related Sections include the following:
   1. Division 03 Section "Cast-in-Place Concrete" for concrete footings.

C. Products furnished, but not installed under this Section, include anchor bolts to be cast in concrete footings, installed in paving.

1.3 SUBMITTALS

A. The Contractor acknowledges its responsibility to submit complete submittals in a timely fashion. Failure to do so may result in automatic rejection of work and/or materials. Incomplete submittals will be returned to the Contractor unreviewed. No time extensions or cost increases will be allowed for delays or costs caused by un-submitted or late submittals or the return of incomplete or incorrect submittals.

B. Product Data: For each type of product indicated.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

   1. Size: Not less than 4-inch- (100-mm-) long linear components and 4-inch- (100-mm-) square sheet components.

E. Product Schedule: For site furnishings. Use same designations indicated on Drawings.

F. Material Certificates: For site furnishings, signed by manufacturers.

G. Maintenance Data: For site furnishings to include in maintenance manuals.

1.4 QUALITY ASSURANCE

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with Manufacturer's requirements.

B. Transport, store, and handle concrete and cast stone units in position consistent with their shape and design.

C. Protect members to prevent staining, cracking, chipping, spalling, bowing, and warping.

D. Use equipment and methods for transportation, site handling and erection, as recommended by Manufacturer.

E. Store units off ground and in manner to prevent cracking, distortion, warping, staining, or other physical damage.

F. Place stored units so that identification marks are discernible.

G. Store so that lifting devices are accessible and undamaged.

H. Protect from water and ice.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated; free of surface blemishes and complying with the following:

1. Rolled or Cold-Finished Bars, Rods, and Wire: ASTM B 211 (ASTM B 211M).
2. Extruded Bars, Rods, Wire, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
3. Structural Pipe and Tube: ASTM B 429.
4. Sheet and Plate: ASTM B 209 (ASTM B 209M).
5. Castings: ASTM B 26/B 26M.

B. Stainless Steel: Free of surface blemishes and complying with the following:

1. Sheet, Strip, Plate, and Flat Bars: ASTM A 666.

C. Glass Fiber Reinforced Concrete (GFRC): High-strength, alkali-resistant glass fiber embedded in concrete matrix, with a lower thickness and weight than cast concrete.

1. Angle Anchors: For inconspicuously bolting legs of site furnishings to on-grade substrate; one per leg.

D. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107; recommended in writing by manufacturer, for exterior applications.

2.2 PRODUCTS

A. Products: Subject to compliance with requirements, provide the named product(s) produced by the named manufacturer(s), unless otherwise indicated.

2.3 FIRE PIT

A. Fire pit construction:
   1. Model: As indicated.
   2. Body: High-performance concrete with smooth finish and ¼” stainless steel top with cover plate.
   3. Burner: Propane, 60,000 BTU/h. ETL listed electronic pilot ignition with flame sensor.
   4. Topping: As indicated.
   5. Size: 72” x 24” x 12.5”h.

2.4 SECTIONAL CHAIR

A. Chair construction:
   1. Model: As indicated.
   2. Frame material: Woven resin wicker and rattan on aluminum inner frame, with metal feet. Weather, water, and fire resistant.
      a. Color: As indicated.
   3. Sectional shape: L-shaped.
   4. Weight capacity: 5 persons, 1375 pounds.
   5. Cushions: Weather resistant, 5” thickness. Polyester blend upholstery with foam fill.
      a. Color: As indicated.

2.5 UMBRELLA

A. Umbrella construction:
   1. Model: As indicated.
   2. Frame material: Marine-grade aluminum with reinforced struts.
   3. Optional finial: As indicated.
   4. Umbrella lift system: Telescoping mast with crank lift system with cam lock lever allowing 360-degree rotation.

2.6 CONTAINER PLANTERS

A. Glass Fiber Reinforced Concrete (GFRC): Manufacturer’s proprietary blend of high-strength and low-weight, alkali-resistant glass fiber embedded in concrete matrix.

B. Planter Shape and Form: Round, tapered column.

C. Style: As indicated by manufacturer's designation.

D. Overall Height: As indicated.

E. Overall Diameter: As indicated.

F. Overall Depth: As indicated.

G. Weight:
1. VCS-2400: 190 lbs.
2. VCS-3000: 300 lbs.
3. VCS-4200: 475 lbs.

H. Capacity:
1. VCS-2400: 4.4 cu. Ft.
2. VCS-3000: 9 cu. Ft.
3. VCS-4200: 14.5 cu. Ft.

I. Installation Method: Freestanding

J. GRFC Color: As selected by Architect from manufacturer's full range.

1. Finish: Textured, as indicated.

2.7 BOLLARDS

A. Bollard Construction:

1. Cover: Not less than 7-7/8” diameter.
   a. Aluminum: Die-cast cover, low copper alloy.
2. Column: Extruded, thick-walled low copper aluminum, minimum wall thickness 0.118” with internal anchor bolts and flush handhole cover.
3. Surge Protector: Designed to protect bollard luminaire from electrical surge (10kA).
4. Light Engine: (6) high flux LEDs mounted to metal core PC boards attached to an aluminum heatsink for long performance and life. LEDs can be instantly started to -20°C. Light Optics: (6) individual precision injected molded lenses consisting of total internal reflection collimator and precision light shaping lens producing asymmetric distribution.
5. Style: Low-profile dome top.
6. Gasketing: Continuous gasket provides weather-proofing, dust, and insect control at shielding base and fixture cover.
7. Overall Height: As indicated.
8. Overall Width: As indicated.
9. Overall Depth: As indicated.
10. Accessories: Manufacturer’s galvanized anchor bolts and galvanized heavy hex nuts and flat washers.
11. Installation Method: Bolted to cast-in anchor bolts.

B. Aluminum Finish: Polyester powder coated.

1. Color: As selected by Architect from manufacturer's full range.

2.8 FABRICATION

A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.

B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.

C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

D. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.

E. Factory Assembly: Assemble components in the factory to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.9 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.10 ALUMINUM FINISHES

A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

C. Install site furnishings level, plumb, true, and securely anchored at locations indicated on Drawings.

3.3 CONTAINER PLANTER INSTALLATION

A. Preparation

1. Before installation, lay out planters in locations indicated. Adjust locations when requested by Architect and obtain Architect's acceptance of layout before installation.

B. Placement

1. Install planters level and plumb. Use concealed shims where required for leveling.
2. Remove shipping wrap, stickers, labels, and residue from planters.

C. Installation of Self-Contained Subirrigation Units

1. Install self-contained subirrigation units into planters according to Manufacturer's written specifications, level and plumb.
2. Install drainage overflow adapters prior to installing self-contained subirrigation units.
3. Trim fill tubes to no less than 1 inch (25 mm) higher than level of planting medium.

D. Installation of Media

1. Install specified planting soil mix, drainage aggregate, and geotextile fabric as indicated.

3.4 CLEANING

A. After completing site furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

END OF SECTION 12 93 00

SECTION 13 30 01 - SITE-ASSEMBLED STRUCTURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Pergola.
2. Arbors.

B. This Section does not include structures attached to buildings.

1.2 RELATED SECTIONS

A. Refer to Division 3 Section “Cast-in-Place Concrete” for masonry wall attachment.

B. Refer to Division 32 Section “Decorative Concrete Paving” for post attachment.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Provide plan and elevations of all sides at scale to demonstrate design intent. Show fabrication and installation details for prefabricated and field-assembled structures.

1. Include all necessary rebates, lugs, and brackets to assemble units and to attach to other work.

C. Samples for Initial Selection:

1. Manufacturer's color charts for each finish indicated.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Size: Not less than 4-inch- (100 mm-) long linear components and 4-inch- (100 mm-) square sheet components.

E. Qualification Data: For Installer.

F. Material Certificates: For the following items, signed by Manufacturers:

1. Prefabricated structures, stating that the product supplied is structurally sound for all loadings and will meet the design intent without modification.

G. Maintenance Data: For prefabricated structures and for finishes to include in maintenance manuals.

H. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by Manufacturer.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which Manufacturer agrees to repair or replace components that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures.
b. Corrosion, rotting, splitting, splintering, delamination, warping or swelling excessively from moisture, and peeling, blistering, and flaking of the factory-applied paint finish.

2. Warranty Period: Twenty-five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide the named Product(s) produced by the named Manufacturer(s), or an approved equal.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

1. Provide either formed- or cast-metal brackets with predrilled hole for exposed bolt anchorage.

2.3 STEEL AND IRON

A. Tubing: ASTM A 500 (cold formed) or ASTM A 513.

B. Bars: Hot-rolled, carbon steel complying with ASTM A 29/A 29M, Grade 1010.

C. Plates, Shapes, and Bars: ASTM A 36/A 36M.

D. Expanded Metal: ASTM F 1267, Type II (expanded and flattened), Class 1 (uncoated).

1. Style Designation: As indicated.

E. Perforated Metal: Cold-rolled steel sheet, ASTM A 1008/A 1008M, or hot-rolled steel sheet, ASTM A 1011/A 1011M, commercial steel Type B, size and type as indicated.

F. Perforated Metal: Galvanized-steel sheet, ASTM A 653/A 653M, G90 (Z275) coating, commercial steel Type B, size and type as indicated.

1. Basis-of-Design Product: Provide product with perforations matching that indicated.

2.4 FASTENERS

A. Fastener Materials: Unless otherwise indicated, provide the following:
1. Stainless-Steel Components: Type 304 stainless-steel fasteners.

B. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

D. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

2.5 CELLULAR PVC

A. Exterior grade, free foam cellular PVC extrusions with small-cell microstructure, having the following properties:

Property	Units	Value	ASTM Method
Physical			
Density	g/cm³	0.55	D 792
Water Absorption	%	<0.50	D 570
Mechanical			
Tensile Strength	psi	3500	D 638
Tensile Modulus	psi	100,000	D 638

Flexural Strength	psi	5100	D 790
Flexural Modulus	psi	215,000	D 790
Modulus of Elasticity	psi	205,000	D 638
Elongation	%	9	D 638
Nail Hold	Lbf/in of penetration	300+	D 1761
Screw Hold	Lbf/in of penetration	240+	D 1037
Gardner Impact	In-lbs	34	D 5420
Notched Izod Impact	Ft-lbs/inch	0.270	D 256
Termite Resistance		10	D3345
Hardness	Lbf/in of penetration	60+	D2240
Thermal			
Coefficient of Linear Expansion	in/in/°F	3.24 x 10-5	D 696
Burning Rate	In/min	Failed to Ignite	D 635
Flame Spread Index	--	< 25	E 84
Heat Deflection Temp (264 psi)	°F	146	D 648
Heat Deflection Temp (66 psi)	°F	153	D 648
Oil Canning (@ 140 °F)	°F	Passed	D 648

B. Manufacturing Tolerances:

1. Variation in component length: Minus 0.00 inch, plus 1.00 inch.
2. Variation in component width: plus or minus 1/32 inch.
3. Variation in component thickness: plus or minus 1/32 inch.
4. Variation in component edge cut: plus or minus 2 degrees.
5. Variation in Density: plus or minus 0.02 grams per cubic centimeter.

C. Workmanship, Finish, and Appearance:

1. Homogeneous and free of voids, holes, cracks, foreign inclusions and other defects. Edges must be square and top and bottom surfaces shall be flat with no convex or concave deviation.
2. Uniform surface free from cupping, warping, and twisting.

2.6 STRUCTURE FABRICATION

A. Assemble items in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

B. Metal Frame: Fabricate main-frame upright support posts from metal pipe or tubing with cross-section profile and dimensions as indicated. Form metal to required shapes and sizes, true to line and level with accurate angles and surfaces. Finish exposed surfaces to smooth, sharp, well-defined lines and arris.

1. Fabricate secondary frame members, bracing, and connections from aluminum. Unless otherwise indicated, provide each tubing main-frame member with manufacturer's standard drainable bottom plate or support flange.
2. Close exposed open ends of frame members with welded plate.
3. Cut, drill, and punch metals cleanly and accurately. Remove sharp or rough areas on exposed surfaces.
4. Mill joints to a tight, hairline fit. Cope or miter corner joints. Fabricate connections that will be exposed to weather in a manner to exclude water.
5. Comply with AWS recommended practices for shop welding and brazing. Weld and braze behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed joints of flux, and dress exposed and contact surfaces.
6. Provide weep holes where water may accumulate.
7. Provide necessary rebates, lugs, and brackets to assemble units and to attach to other work. Cut, reinforce, drill, and tap to receive finish hardware, screws, and similar items, unless otherwise indicated.
8. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.
9. Close exposed open ends of frame members with welded plate.

C. Wood Frame: Fabricate main-frame upright support posts from wood species and with profile and dimensions as indicated.

1. Surfaced members smooth on all sides and with all edges rounded, and obtained from sources that participate in sustained yield programs.

2.7 FINISHES, GENERAL

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, site surface and subgrade drainage, and other conditions affecting performance.

1. Do not begin installation before adjacent work, except planting, is complete, unless otherwise permitted by Architect.

2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Verify locations of structures. Verify that preset fasteners and pier locations, dimensions, and elevations comply with requirements for each type and component prior to fabrication and/or ordering of materials.

1. Contractor assumes responsibility for materials fabricated and/or ordered prior to verification of as-built conditions and coordination of remedial measures, if required.

3.3 INSTALLATION, GENERAL

A. Prefabricated Structures: Comply with Manufacturer's written installation instructions, unless more stringent requirements are indicated. Anchor securely, positioned at locations and elevations indicated. Conceal fasteners from view.

B. Field-assembled Components: Assemble components and pre-assembled structures to the greatest extent possible prior to setting in place. Conceal fasteners from view.

C. Bearing plates set on pier tops: Level bearing plates with mortar setting bed to required elevation. Compress mortar and strike of at 45 degrees.

END OF SECTION 13 30 01

SECTION 32 13 13 - CONCRETE PAVING, PEDESTRIAN

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Pedestrian walks that do not have stamped or colored cement concrete pavement.

B. Section does not include concrete for the following:

1. Roadways, driveways.
2. Curbs, curb ramps, gutters.
3. Footings.
4. Building slabs, walls.

C. Related Sections:

1. Section 03 30 00 "Cast-in-Place Concrete" for general building applications of concrete.
2. Section 32 13 16 "Decorative Concrete Paving" for stamped concrete other than detectable warnings, integral and top-dressed colorants, and exposed aggregate concrete.
3. Section 32 13 73 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 SUBMITTALS, GENERAL

A. The Contractor acknowledges its responsibility to submit complete submittals in a timely fashion. Failure to do so may result in automatic rejection of work and/or materials. Incomplete submittals will be returned to the Contractor unreviewed. No time extensions or cost increases will be allowed for delays or costs caused by un-submitted or late submittals or the return of incomplete or incorrect submittals.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of product, ingredient, or admixture requiring color selection.

C. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.6 INFORMATIONAL SUBMITTALS

A. Documentation of proof-rolled subgrades at each slab-on-grade location.

1.7 QUALITY ASSURANCE

A. Installer Qualifications:

1. An experienced installer who has successfully completed Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
2. A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
3. Coordinate and isolate concrete from different loads to minimize visibility of slight color variations between batches.

B. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

C. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

D. Source Limitations: Obtain each specified material from same source and maintain high degree of consistency in workmanship throughout Project.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
2. Build mockups of full-thickness sections of concrete paving to demonstrate typical joints; surface finish, texture, and color; curing; and standard of workmanship.
3. Build mockups of concrete paving in the location and of the size indicated or, if not indicated, build mockups where directed by Architect and not less than 96 inches (2400 mm) by 96 inches (2400 mm). Notify Architect seven days in advance of dates and times when mockups will be completed and ready for inspection.
4. Obtain Architect's approval of mockups before starting construction.

5. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store products in a location protected from damage, construction activity, and moisture in strict accordance with the Manufacturer's recommendations.

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending, damage, and/or corrosion.

1.9 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Schedule placements to minimize exposure to wind and heat before curing materials are applied.

C. Avoid placing concrete if rain, snow, or frost is forecast within 24 hours. Protect fresh concrete from moisture and freezing.

D. Comply with professional practices described in ACI 305 and ACI 306R.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet (30.5 M) or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Epoxy-Coated Welded Wire Reinforcement: ASTM A 884/A 884M, Class A, plain steel.

B. Epoxy-Coated, Joint Dowel Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars.

C. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

E. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150, Type I/II, white portland cement. Supplement with the following:

B. Normal-Weight Aggregates: ASTM C 33, Class 4S, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 3/4 inch (19 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: Potable and complying with ASTM C 94/C 94M.

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.

4. Color: As indicated.

2.4 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry or cotton mats.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Anti-Hydro International, Inc.
b. ChemMasters, Inc.
c. Dayton Superior.
d. Euclid Chemical Company (The); an RPM company.
e. Kaufman Products, Inc.
f. L&M Construction Chemicals, Inc.
g. Lambert Corporation.
h. Nox-Crete Products Group.
i. Right Pointe.
j. SpecChem, LLC.
k. TK Products.
l. Vexcon Chemicals Inc.
m. W.R. Meadows, Inc.

2.5 RELATED MATERIALS

A. Joint Fillers:

1. General: Asphalt-saturated cellulosic fiber materials are prohibited.
2. Typical sidewalks:

a. Sealant over backer rod, cork, or sponge rubber per Division 32 Section “Paving Joint Sealants.”

B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881/C 881M, two-component epoxy resin capable of humid curing and bonding to damp surfaces; of class suitable for application temperature, of grade complying with requirements, and of the following types:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.6 DETECTABLE WARNING MATERIALS

A. Detectable Warning Blockouts in concrete for detectable paving units.

2.7 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M), for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 4500 psi (31 MPa).
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
3. Slump Limit: 4 inches (100 mm), plus or minus 1 inch (25 mm).

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: 4-1/2 percent plus or minus 1.5 percent for 1-1/2-inch (38-mm) nominal maximum aggregate size.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph (5 km/h).

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M.

F. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch (50-mm) overlap of adjacent mats.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Sleeve one-half of dowel length to prevent concrete bonding to one side of joint.

C. Expansion (Isolation) Joints: Form expansion joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 20 feet unless otherwise indicated.

a. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Sleeve one-half of dowel length to prevent concrete bonding to one side of joint.

2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished surface.
4. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
5. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint. Install sealant as indicated and per Division 32 Section “Paving Joint and Sealants.”

D. Control (Contraction) Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch (6-mm) radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.
2. Sawed Joints: Prohibited.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 (ACI 301M) requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301 (ACI 301M) by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement. dowels. and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

K. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

   a. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch (1.6 to 3 mm) deep with a stiff-bristled broom, perpendicular to line of traffic.

3.8 FINISHING FORMED SURFACES

A. Rough-formed Finish: As-cast concrete texture imparted by form-facing materials and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

   1. Apply to concrete surfaces not exposed to public view.

B. Smooth-formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

   1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, to be covered with a coating or covering material applied directly to concrete.

3.9 SPECIAL FINISHES

A. Slip-Resistive Aggregate Finish: Before final floating, spread slip-resistive aggregate finish on paving surface according to manufacturer's written instructions and as follows:

   1. Uniformly spread 40 lb/100 sq. ft. (19.5 kg/10 sq. m) of dampened, slip-resistive aggregate over paving surface in two applications. Tamp aggregate flush with surface using a steel trowel, but do not force below surface.
   2. Uniformly distribute approximately two-thirds of slip-resistive aggregate over paving surface with mechanical spreader, allow to absorb moisture, and embed by power floating. Follow power floating with a second slip-resistive aggregate application, uniformly distributing remainder of material at right angles to first application to ensure uniform coverage, and embed by power floating.
   3. Cure concrete with curing compound recommended by slip-resistive aggregate manufacturer. Apply curing compound immediately after final finishing.
   4. After curing, lightly work surface with a steel wire brush or abrasive stone and water to expose nonslip aggregate.

3.10 DETECTABLE WARNINGS

A. Blockouts: Form blockouts in concrete for installation of detectable paving units specified in Section 32 14 00 "Unit Paving".

1. Tolerance for Opening Size: Plus 1/4 inch (6 mm), no minus.

3.11 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

a. Water.
b. Continuous water-fog spray.
c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
d. Curing and sealing compounds on surfaces to be covered by unit pavers set in mortar are prohibited.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm) and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.12 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch (19 mm).

2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
3. Surface: Gap below 10-foot- (3-m-) long, unleveled straightedge not to exceed 1/2 inch (13 mm).
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches (13 mm per 300 mm) of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch (25 mm).
6. Vertical Alignment of Dowels: 1/4 inch (6 mm).
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches (6 mm per 300 mm) of dowel.
8. Joint Spacing: 3 inches (75 mm).
9. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
10. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.13 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 13 13

SECTION 32 13 16 - DECORATIVE CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following exterior pedestrian concrete pavements:

1. Stamped cement concrete pavement.
2. Colored cement concrete pavement.

B. Related Sections include the following:

1. Division 03 Section "Cast-in-Place Concrete" for general building applications of concrete.
2. Division 32 Section "Concrete Paving" for cast-in-place concrete pavement with other finishes.
3. Division 32 Section "Concrete Paving Joint Sealants" for joint sealants within decorative cement concrete pavement and at isolation joints of decorative cement concrete pavement with adjacent construction.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 SUBMITTALS

A. The Contractor acknowledges its responsibility to submit complete submittals in a timely fashion. Failure to do so may result in automatic rejection of work and/or materials. Incomplete submittals will be returned to the Contractor unreviewed. No time extensions or cost increases will be allowed for delays or costs caused by un-submitted or late submittals or the return of incomplete or incorrect submittals.

B. Product Data: For each type of product indicated.

C. Design Mixtures: For each decorative cement concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

D. Shop Drawings: Indicate sequence of pours, indicating load placement.

E. Samples for Initial Selection:
   1. For other colorant and staining agents: Manufacturer's product data.

   2. Manufacturer's cut sheets indicating selected pattern(s).

F. Samples for Verification:

   1. Submit samples of each color/texture application in enough quantity to demonstrate extremes.
   2. Submit two samples of each pigment and mix rate, one each with white cement and one with gray cement.
   3. Following review of Samples, prepare up to two additional sets of samples, as directed by the Architect, with adjusted pigments mix rates.
   4. Each sample to be minimum 4 by 4 inches (100 by 100 mm) and exhibit final finishes, materials, and workmanship for pavement installation.

G. Qualification Data: For Installer, ready-mix concrete producer, and testing agency.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer with 10-years experience in manufacture of specified products.

B. Installer Qualifications: An employer of workers trained and approved by manufacturer of decorative cement concrete pavement systems.

C. Ready-Mix-Concrete Producer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

D. Source Limitations: Obtain decorative cement concrete pavement products and each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate through one source.

E. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

G. Mockups: Cast mockups of full-size sections of decorative cement concrete pavement to demonstrate typical pattern, texture, surface finish, color, joints, and standard of workmanship.

   1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
   2. Notify Architect seven days in advance of dates and times when mockups will be completed and ready for inspection.
   3. In presence of Architect, damage part of the exposed surface of decorative cement concrete pavement for each finish, color, and texture required, and demonstrate materials and techniques proposed for repair to match adjacent undamaged surfaces.

4. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
5. Undamaged portions of approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in original factory unopened, undamaged packaging bearing identification of product, manufacturer, batch number, and expiration data as applicable.

B. Store the product in a location protected from damage, construction activity, and precipitation in strict accordance with the manufacturer's recommendations.

C. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending, damage, and/or corrosion.

1.7 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 PRODUCTS: Subject to compliance with requirements, provide the named product(s) produced by the named manufacturer(s), unless otherwise indicated.

2.2 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.3 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or curved forms for curves of a radius 100 feet (30.5 m) or less.

B. Forms for Textured Finish Concrete: Units of face design, size, arrangement, and configuration indicated. Provide solid backing and form supports to ensure stability of textured form liners.

C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.4 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

B. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60 (Grade 420). Cut bars true to length with ends square and free of burrs.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.5 CONCRETE MATERIALS

A. Cementitious Material: Use one of the following cementitious materials, of the same type, brand, and source, throughout Project:

1. White Portland Cement: ASTM C 150, Type I or III.

B. Normal-Weight Aggregates: ASTM C 33, Class 4S, uniformly graded. Provide aggregates from a single source.

1. Maximum Aggregate Size: 3/4 inch (19 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: Potable and complying with ASTM C 94/C 94M.

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
3. Water-Reducing and Accelerating Admixture: ASTM C 494/C 494M, Type E.

2.6 COLOR MATERIALS

A. Antiquing Agent: Manufacturer's standard transparent, water-based antiquing agent that produces an antique finish on concrete surfaces.

2.7 IMPRINTING TOOLS

A. Stamp Mats: Semirigid polyurethane mats with projecting textured and ridged underside capable of imprinting texture and joint patterns on plastic concrete.

2.8 CURING AND SEALING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Available Products:

a. Axim Concrete Technologies; Cimfilm.
b. Burke by Edoco; BurkeFilm.
c. ChemMasters; Spray-Film.
d. Conspec Marketing and Manufacturing Co., Inc.; Aquafilm.
e. Dayton Superior Chemical Division; Sure Film.
f. Euclid Chemical Company (The); Eucobar.
g. Increte Systems Inc.; Increte Delay.
h. Kaufman Products, Inc.; Vapor Aid.
i. Lambert Corporation; Lambco Skin.
j. L&M Construction Chemicals, Inc.; E-Con.
k. MBT Protection and Repair, Div. of ChemRex; Confilm.
l. Meadows, W. R., Inc.; Sealtight Evapre.
m. Metalcrete Industries; Waterhold.
n. Nox-Crete Products Group, Kinsman Corporation; Monofilm.
o. Sika Corporation, Inc.; SikaFilm.
p. Symons Corporation; Finishing Aid.
q. Vexcon Chemicals, Inc.; Certi-Vex EnvioAssist.

B. Clear Acrylic Sealer: Manufacturer's standard waterborne, membrane-forming, medium-gloss, acrylic copolymer emulsion solution, specifically manufactured for colored concrete, containing not less than 15 percent solids by volume, nonyellowing, and UV resistant.

1. Available Products:

a. Advanced Surfaces, Inc.; Clear Sealer - Water Base.
b. Bomanite Corporation; Sealer - Water-Based.
c. Cobblecrete International; Acrylic Sealer Water Based.
d. Increte Systems Inc.; Water Based Clear Seal.
e. Kemiko; Stone Tone Sealer.
f. Rafco Products; Satinseal.
g. Scofield, L. M. Company; Cementone Clear Sealer.
h. Southern Color Company, Inc.; Redi Color Seal Plus.
i. Stampcrete International Ltd.; WB 6000.
j. Symons Corporation; Decorative Sealer WB.

C. Slip-Resistant Additive: Manufacturer's standard finely graded aggregate or polymer additive, designed to be added to clear acrylic sealer, to result in a slip-resistant surface.

1. Available Products:

    a. Advanced Surfaces, Inc.; Skid Guard.
    b. Bon Tool Co.; Gator Grip.
    c. H&C Concrete Care Products; SharkGrip.
    d. Increte Systems Inc.; Shur-Grip.
    e. Southern Color Company, Inc.; Redi-Grip.
    f. Stampcrete International Ltd.; Shark-Skin.
    g. Superstone, Inc.; Super Grip.
    h. Symons Corporation; Grip Aid.

2.9 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 4500 psi (31 MPa).
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
3. Slump Limit: 4 inches (100 mm), plus or minus 1 inch (25 mm).

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: 5-1/2 percent plus or minus 1.5 percent for 1-1/2-inch (38-mm) nominal maximum aggregate size.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

F. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.10 CONCRETE MIXING

A. General: for mixes involving colorant:

1. Do not add calcium chloride to any mix that will receive colorant.
2. Do not use supplemental admixtures unless approved in writing by the colorant Manufacturer.

3. Do not add water to the mix in the field.
4. Maximum air content shall not exceed 5 percent.

B. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with tolerances for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph (5 km/h).

C. Proceed with decorative cement concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

B. Protect adjacent construction from discoloration and spillage during application of color hardeners, release agents, stains, curing compounds, and sealers.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

A. General: Construct construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.

1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour, unless pavement terminates at isolation joints.

1. Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
2. Provide tie bars at sides of pavement strips where indicated.
3. Dowelled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 20 feet (6.10 M), unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

E. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcement steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site.

F. Do not add water to fresh concrete after testing.

G. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

H. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

I. Screed pavement surfaces with a straightedge and strike off.

J. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

K. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.

L. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture

temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

M. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F (32 deg C). Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover reinforcement steel with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog spray forms, reinforcement steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

3.8 STAMPING

A. Mat Stamping: While initially finished concrete is plastic, accurately align and place stamp mats in sequence. Uniformly load mats and press into concrete to produce required imprint pattern and depth of imprint on concrete surface. Remove stamp mats immediately. Hand stamp edges and surfaces unable to be imprinted by stamp mats.

1. Remove unembedded release agent no fewer than three days after stamping concrete. High pressure wash surface and joint patterns, taking care not to damage stamped concrete. Control, collect, and legally dispose of runoff.
2. Antiquing Agent: Apply over liquid release agent according to manufacturer's written instructions.

3.9 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Paper: Cure with unwrinkled curing paper in pieces large enough to cover the entire width and edges of slab. Do not lap sheets. Fold curing paper down over pavement edges and secure with continuous banks of earth to prevent displacement or billowing due to wind. Immediately repair holes or tears in paper.

3.10 SEALER

A. Clear Acrylic Sealer: Apply uniformly in two coats in continuous operations according to manufacturer's written instructions. Allow first coat to dry before applying second coat, at 90-degrees to the direction of the first coat using same application methods and rates.

1. Begin sealing dry surface no sooner than 28 days after concrete placement.
2. Mix slip-resistant additive thoroughly in sealer before application according to manufacturer's written instructions. Stir sealer occasionally during application to maintain even distribution of additive.

3.11 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4 inch (6 mm).
2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
3. Surface: Gap below 10-foot- (3-m-) long, unleveled straightedge not to exceed 1/4 inch (6 mm).
4. Lateral Alignment and Spacing of Dowels: 1 inch (25 mm).
5. Vertical Alignment of Dowels: 1/4 inch (6 mm).
6. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches (6 mm per 300 mm).
7. Joint Spacing: 3 inches (75 mm).
8. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
9. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.12 REPAIRS AND PROTECTION

A. Remove and replace decorative cement concrete pavement that is broken, damaged, or does not comply with requirements in this Section in complete sections from joint to joint, unless otherwise approved by Architect.

B. Detailing: Grind concrete "squeeze" left from tool placement. Color ground areas with slurry of color hardener mixed with water and bonding agent. Remove excess release agent with high-velocity blower.

C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain decorative cement concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep decorative cement concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 13 16

SECTION 32 13 73 - PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Expansion and isolation joints within cement concrete pavement.

B. Related Sections include the following:

1. Division 32 Section "Concrete Paving - Pedestrian" for constructing joints in concrete pavement.

1.3 SUBMITTALS

A. The Contractor acknowledges its responsibility to submit complete submittals in a timely fashion. Failure to do so may result in automatic rejection of work and/or materials. Incomplete submittals will be returned to the Contractor unreviewed. No time extensions or cost increases will be allowed for delays or costs caused by un-submitted or late submittals or the return of incomplete or incorrect submittals.

B. Product Data: For each joint-sealant product indicated.

C. Samples for initial selections: For each type of joint sealant required, as selected by Architect from manufacturer's full range.

D. Samples for Verification: For each type and color of joint sealant required. Install joint-sealant samples in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (4.4 deg C).
2. When joint substrates are wet or covered with frost.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 COLD-APPLIED JOINT SEALANTS

A. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, nonsag silicone sealant complying with ASTM D 5893 for Type NS.

1. Available Products:

a. Crafco Inc.; RoadSaver Silicone.

b. Dow Corning Corporation; 888.

B. Single-Component, Self-Leveling, Silicone Joint Sealant for Concrete: ASTM D 5893, Type SL.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Crafco Inc., an ERGON company; RoadSaver Silicone SL.
b. Dow Corning Corporation; 890-SL.
c. Pecora Corporation; 300 SL.

C. Multi-component, Non-sag, Traffic-grade, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use T.

1. Available Products:

a. BASF Building Systems; Sonolastic NP 2.
b. LymTal International, Inc.; Iso-Flex 885 SG.
c. May national Associates, Inc.; Elasto-Thane 227 High Shore Type II.
d. Pecora Corporation; Dynatred.
e. Tremco, Inc.; Vulkem 227.

2.4 JOINT-SEALANT BACKER MATERIALS

A. General: Provide joint-sealant backer materials that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.

B. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, closed cell polyethylene, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

1. Minimum diameter: 25% greater than joint width.

C. Cork or self-expanding cork: ASTM D 1752, Type 2.

D. Sponge rubber: ASTM D 1752, Type I, closed cell sponge rubber.

E. Contractor option: Provide ½ inch deep snap caps with any of the above to hold space for sealant during concrete installation. Match joint width.

1. For applications where snap cap is to remain as surface joint filler, color shall be as selected by Architect from Manufacturer's full range of standard colors.

F. Pre-fabricated PVC Expansion Joint. Above snap cap required.

2.5 PRIMERS

A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of backer materials.
2. Do not stretch, twist, puncture, or tear backer materials.
3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.

2. Completely fill recesses provided for each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions, unless otherwise indicated.

G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations with repaired areas are indistinguishable from the original work.

END OF SECTION 32 13 73

SECTION 32 91 13 - SOIL PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

A. Section includes Planting Soils specified by composition of the mixes.

B. Related Requirements:
   1. Division 2 Section "Excavating, Backfilling, and Compacting" for excavation, filling and backfilling, and rough grading.
   2. Division 32 Section "Turf and Grasses" for placing Planting Soil for turf and grasses.
   3. Division 32 Section "Plants" for placing Planting Soil for plantings.

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or unamended soil, as indicated.

B. CEC: Cation exchange capacity.

C. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.

D. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.

E. Foreign Matter: Any matter over a 1/16 inch (2 mm) dimension that results from human intervention and having organic or inorganic constituents such as metal, glass and synthetic polymers (e.g. plastic and rubber) that may be present, but excluding mineral soils, woody material and rocks.

F. Imported Soil: Soil that is transported to Project site for use.

G. Layered Soil Assembly: A designed series of Planting Soils, layered on each other, that together produce an environment for plant growth.

H. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce Planting Soil.

I. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.

J. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

L. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.

M. SSSA: Soil Science Society of America.

N. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before Planting Soil is placed.

O. Subsoil: Lower ‘B’ horizon from a natural or cultivated soil profile, well-drained and not including bogs or wetlands, typified by the lack of organic matter and soil organisms.

P. Topsoil: Surface ‘A’ horizon from natural or cultivated surface profile, well-drained and not including bogs or wetlands, containing organic matter, sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of weeds, weed propagules, roots, and deleterious materials. Percentage by mass and pH shall meet ASTM D5268-92, Table 1.

Q. USCC: U.S. Composting Council.

1.4 COORDINATION

A. Coordinate with work of other trades to preset conduits and position equipment travel ways in areas not used for planting.

1. Where positioning equipment travel ways in areas not used for planting is unavoidable, as determined by the Architect, install Construction Matting and Tree Protection Fencing per Division 01 Section “Temporary Tree and Plant Protect” along route, as approved by Architect, to prevent soil compaction.

B. Prevent mixing, contamination, or reversing soil profile from other Work. Repair any disturbance to the soil layers after placing to comply with the specified requirements.

C. Contractor is responsible for inspecting the site and reviewing entire set of Construction Documents to become familiar with effects and potential effects on Planting installation, including but not limited to the following: access, laydown and stockpile areas, excavation, fill, soil compaction, known and potentially known utilities, persistent winds, surface drainage, and drainage of subgrade.

1.5 SUBMITTALS, GENERAL

A. The Contractor acknowledges its responsibility to submit complete submittals in a timely fashion. Failure to do so may result in automatic rejection of work and/or materials. Incomplete submittals may be returned to the Contractor unreviewed. No time extensions or cost increases will be allowed for delays or costs caused by un-submitted or late submittals or the return of incomplete submittals.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include test data substantiating that products comply with requirements.
2. Include sieve analyses for aggregate materials.

B. Samples: For each bulk-supplied material, 1-quart (1-L) volume of each in clear, rigid, sealed containers labeled with content, source, and date obtained. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1.7 INFORMATIONAL SUBMITTALS

A. Preconstruction Test Reports:

1. Soil Analyses.
2. Percolation Testing.

1.8 PRECONSTRUCTION TESTING

A. Soil Analyses: Engage a qualified testing agency to perform soil analyses on each Planting Soil Mix type to be used in planting operations.

1. Testing agency shall provide a written report containing soil-amendment and fertilizer recommendations according to "Sampling Requirements" and "Testing Requirements" articles.
2. Testing agency shall identify and label samples and test reports according to sample collection and labeling requirements.
3. Submit test results not less than 60 days prior to installation and before material is purchased.

B. Percolation Testing:

1. Submit percolation test reports for placed, properly compacted, presoaked planting soil, not less than one for each general planting type and area (i.e.; tree pits, general planting, on-structure, off structure, etc.) certifying that proposed pre-soaked soil absorbs water at not less than 0.25 inch (6 mm) per hour by either of the following:

a. Double ring infiltrometer.

b. Rectangular pit 24 inches (600 mm) square by 18 inches (450 mm) deep. Fill pit with 6 inches (150 mm) of water, and time the infiltration rate.

2. If the rate is less than, notify Architect to determine need for subsurface drainage or other drainage relief measures.

1.9 SAMPLING REQUIREMENTS

A. General: Extract soil samples according to requirements in this article.

B. Sample Collection and Labeling: Have samples taken and labeled by soil scientist (CPSS) certified by SSSA, soil classifier (CPSC) certified by SSSA, soil scientist (RPSS) registered by the National Society of Consulting Soil Scientists, or state-certified, -licensed, or -registered soil scientist under the direction of the testing agency.

1. Number and Location of Samples: Minimum of three representative soil samples from varied locations, unless otherwise indicated, for each soil to be used or amended for landscaping purposes.
2. Procedures and Depth of Samples: According to USDA-NRCS's "Field Book for Describing and Sampling Soils."
3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.
4. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

1.10 TESTING REQUIREMENTS

A. Soil Analysis Reports: Furnish analyses and written reports by a qualified soil-testing laboratory stating the following:

1. Texture Analysis: State sand, silt, and clay content, including particle size analysis of sand fraction
2. pH
3. Percentage of Organic Matter
4. Calcium
5. Magnesium
6. Potassium
7. Phosphorous
8. Iron
9. Boron
10. Manganese
11. Copper
12. Zinc
13. Soluble Salts
14. Cation Exchange Capacity
15. Presence and quantities of problem materials including salts and metals indicated. If such problem materials are present, provide additional recommendations for corrective action.
16. Other deleterious materials, including their characteristics and content of each.

B. Results: Soils falling within the following ranges may be considered provisionally acceptable. Soils that fall outside of any of the indicate ranges may be amended, retested, and resubmitted for Architect's review.

1. Texture Analysis: Within 5% each of 20% clay, 30% silt, 50% sand.
2. pH range: 5.5-7
3. Organic material content: Minimum 4%
4. Calcium: 2400-3000 ppm
5. Magnesium: 150-450 ppm
6. Potassium: 140-250 ppm
7. Phosphorous: 30-40 ppm
8. Iron: 20-25
9. Boron: 0.5-1
10. Manganese: 5-20
11. Copper: 0.3-1
12. Zinc: 1-3
13. Soluble Salts: 0.2-1.5 mmhos/cm (dS/m, or mS/cm)
14. Cation exchange capacity: Minimum 10

C. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory Planting Soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.

1. Fertilizers and Soil Amendment Rates: State recommendations for each planting type in weight per 1000 sq. ft. (100 sq. M) for 6-inch (150-mm) depth of soil.
2. Soil Reaction: State the recommended liming rates for raising pH or sulfur for lowering pH according to the buffered acidity or buffered alkalinity in weight per 1000 sq. ft. (100 sq. M) for 6-inch (150-mm)depth of soil.

D. Methodology:

1. Texture: Soil-particle, size-distribution analysis by the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":

    a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
    b. Hydrometer Method: Report percentages of sand, silt, and clay.

2. CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
3. Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present, include recommendations for corrective action.
4. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.
5. Fertility Testing: Soil-fertility analysis according to standard laboratory protocol of SSSA NAPT NCR-13 including the following:

6. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."

1.11 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Protect planting soil mix stockpiles after mixing from erosion, saturation, and weed growth.
3. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
4. Do not move or handle materials when they are wet or frozen.
5. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

PART 2 - PRODUCTS

2.1 TOPSOIL

A. General Characteristics:

1. Friable and with sufficient structure to give good tilth and aeration. Continuous, air-filled pore space content on a volume/volume basis shall be at least 15 percent when moisture is present at field capacity. Soil shall have a field capacity of at least 15 percent on a dry weight basis.
2. Free of undesirable organisms and their eggs; disease-, stress-, and damage-causing plant pathogens; or weeds, noxious species and invasive plants including, but not limited to, quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass.
3. Free of stones, roots, plants, sod, and clay lumps exceeding 3 inches (75 mm) in any dimension, and pockets of coarse sand that exceed a combined maximum of 8 percent by dry weight of the imported soil.
4. Free of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful or potentially harmful to plant growth.

B. Sources:

1. Existing, on-site surface soil, with the duff layer, if any, retained; free of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth; and

stockpiled on-site; complying with requirements herein; modified to produce viable Planting Soil.

2. Imported, naturally formed soil from off-site sources modified to produce viable Planting Soil.

    a. Take imported, unamended soil from sources that are naturally well-drained sites where topsoil occurs at least 4 inches (100 mm) deep, not from agricultural land, bogs, or marshes

2.2 PLANTING SOILS

A. Blend the following Planting Soil components by volume mechanically using a commercial mixer or shredder. Uniformly incorporate ingredients. Do not over-mix or create fines. Do not allow mix to become contaminated with foreign material or saturated.

1. General Planting Beds on Grade

    a. 4 parts topsoil.
    b. 4 parts excavated soil.
    c. 1 part pine fines.
    d. 1 part compost.
    e. 2 parts coarse sand.

2. Container Planters on Grade:

    a. 1 part topsoil.
    b. 1 part compost.
    c. 1 part coarse sand.

2.3 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: O, with a minimum of 95 percent passing through a No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through a No. 60 (0.25-mm) sieve.
2. Form: Provide lime in form of ground dolomitic limestone.

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through a No. 40 (0.425-mm) sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Perlite: Horticultural perlite, soil amendment grade.

E. Calcined Clay: Lightweight, absorbent mineral capable of holding up to 90-130 percent of its weight in water while resisting compaction. Must meet ASTM-C88 sulfate Soundness Test. Not to exceed 5% degradation on Static Degradation Test.

A. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 (0.30-mm) sieve.

1. Recycled gypsum meeting this specification above is acceptable.

B. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33/C 33M.

2.4 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter produced by composting source material, and bearing USCC's "Seal of Testing Assurance," and as follows:

1. Sources:

a. Screened Leaf Compost: Compost generated from a clean and consistent source of locally obtained leaves and yard trimmings, bearing the Seal of Testing Assurance (STA) by the US Composting Council and complying with the following:

1) Cured for not less than 21 days.
2) Heated to not less than 140 degrees Fahrenheit.
3) 100 percent passing a ½ inch screen.
4) Reduction of organic matter greater than 60 percent by weight.

b. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

c. Composted Sewage Sludge: Commercially available, high quality, environmentally safe, sterile, EPA-approved soil product for agronomic use. The product shall be composed of lime-stabilized or naturally dewatered biosolids, combined with wood chips according to EPA standards, aerated and composted for 21 days, including 3 days at 131 degrees Fahrenheit, and screened through a ¾ inch screen. The product shall exhibit the following characteristics:

Total Nitrogen (N)	1.2% available
Phosphoric Acid (P2O5)	1% soluble
Potash (K2O)	0.25%
Micro-nutrient Content (Fe, Mn, S, Zn, Ni, Cu, B)	
Low Cadmium Content	
EPA Approval Pathogen Destruction	

2. Reaction: pH of 5.5 to 8.
3. Soluble-Salt Concentration: Less than 4 dS/m.
4. Moisture Content: 35 to 55 percent by weight.
5. Organic-Matter Content: 50 to 60 percent of dry weight.
6. Inert Contaminants: Not exceeding 0.5 percent.
7. Particle Size: Minimum of 98 percent passing through a 1/2-inch (13-mm) sieve.

B. Composted Cotton Burr: Compost generated from cotton seed pods, having a neutral pH value, and baring the Seal of Testing Assurance by the US Composting Council.

C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture with 100 percent passing through a 1/2-inch (13-mm) sieve, a pH of 6 to 7.5, a soluble-salt content measured by electrical conductivity of maximum 5 dS/m, having a water-absorbing capacity of 1100 to 2000 percent, and containing no sand.

D. Pine Fines: Finely ground pine bark; screened; aged not less than 9 months; pH of 4-5; 100 percent passing through a 1/2-inch (13-mm) sieve; free of foreign material.

2.5 FERTILIZERS

A. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

B. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.

C. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.

PART 3 - EXECUTION

3.1 GENERAL

A. Notify Architect minimum 10 days prior to soil installation. Do not proceed with installation of soil materials until obtaining Architect’s approval of Submittals including, but not limited to, soil analyses and percolation tests.

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Exercise care working over structure and/or subsurface drainage to avoid damage to adjacent work. Contractor shall be responsible and bare all related costs for correcting all such damages. Should any damage occur during planting, immediately notify the Architect.

D. Place planting soil and fertilizers according to requirements in other Specification Sections.

E. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in Planting Soil.

F. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.

G. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

H. Proceed with placement only after unsatisfactory conditions have been corrected. Commencement of Work constitutes acceptance of conditions and resulting affects and potential effects on plant health. Contractor shall be responsible and bare all related costs for correcting all unsatisfactory and defective work.

3.2 PREPARATION OF UNAMENDED, ON-SITE TOPSOIL BEFORE AMENDING

A. Unacceptable Materials: Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.

B. Unsuitable Materials: Clean soil to contain a maximum of 8 percent by dry weight of stones, roots, plants, sod, clay lumps, and pockets of coarse sand.

C. Screening: Pass through a 3-inch (75-mm) sieve to remove large materials.

3.3 MIXING AND PLACING PLANTING SOIL

A. General: Mix Planting Soil components off-site. Do not mix or handle if components or subgrade are frozen, muddy, or excessively wet.

1. Apply amendments and fertilizers according to testing laboratory’s recommendations.

    a. Mix lime and sulfur, if required, with dry soil before mixing fertilizer.
    b. Mix other amendments and fertilizers with Planting Soil no more than seven days before planting.

2. Contractor Option: Planting Soil may be blended on site, if previously approved in writing by the Architect.

B. Subgrade Preparation: Apply gypsum at 200 pounds per 1000 SF and fracture subgrade to a minimum depth of 8 inches (200 mm) with excavator teeth or similar means. Remove stones, sticks, and roots larger than 4 inches (100 mm) in any dimension, rubbish, and other extraneous matter, and legally dispose of them off Owner's property.

1. Do not overwork subgrade. Some stones, roots, and soil clods are expected to remain.

C. Application: Spread planting soil to total depth indicated, but not less than required to meet finish grades after natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.

1. Lifts: Apply planting soil in lifts not exceeding 12 inches (300 mm) in loose depth for material compacted by compaction equipment, and not more than 6 inches (150 mm) in loose depth for material compacted by hand-operated tampers.

D. Compaction: Compact each lift of planting soil to 80 to 85 percent of maximum Standard Proctor density according to ASTM D 698.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.4 FIELD QUALITY CONTROL

A. Engage a qualified testing agency to perform the following test.

1. Compaction: Test planting-soil compaction after placing each lift and at completion using a densitometer or soil-compaction meter calibrated to a reference test value based on laboratory testing according to ASTM D 698. Space tests at no less than one for each 1000 sq. ft. (100 sq. M) of in-place soil or part thereof.

B. Perform the following test:

1. Percolation: Immediately following compaction and finished grading of Planting Soil installation.

a. Test each type of planting section including, but not limited to, the following conditions: on Structure, on Grade, General Planting, Tree Pit, Raised Planter, with subdrainage, without subdrainage, etc.
b. Excavate a typical planting pit per typical Planting Details. Fill the pit with water to a depth of 12 inches (300 mm). Report length of time required for the water to percolate into the soil, leaving the pit empty. Within 6 hours of the time the water has drained from the pit, and in the presence of the Architect, again fill the pit with water to a depth of 12 inches (300 mm).
c. Open down-stream clean-outs and verify that water is flowing at an acceptable rate through all planter subdrainage systems.
d. If the water does not completely percolate into the soil within 9 hours, submit a proposal for drainage system improvements. Do not proceed with planting until a determination is made by the Architect.

C. Soil will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Label each sample and test report with the date, location keyed to a site plan or other location system, visible conditions when and where sample was taken, and sampling depth.

3.5 PROTECTION

A. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Vehicle traffic.
4. Foot traffic.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.

B. If Planting Soil or subgrade is over-compacted, disturbed, or contaminated by foreign or deleterious materials, remove the Planting Soil and contamination; restore the subgrade as directed by Architect and replace contaminated Planting Soil with new Planting Soil.

3.6 CLEANING

A. Protect areas adjacent to Planting Soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition.

B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.

END OF SECTION 32 91 13

NVRPA DOCUMENT GC 101

INSTRUCTIONS TO BIDDERS AND GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES;
CONSULTATION WITH AN ATTORNEY IS ENCOURAGED
2018 EDITION

GENERAL CONDITIONS
OF THE CONSTRUCTION CONTRACT WITH
THE NORTHERN VIRGINIA REGIONAL PARK AUTHORITY

Article 1: DEFINITIONS

(a) **Addenda – Written or graphic instruments issued prior to the Award of the Contract which modify or interpret the Contract Documents, Drawings, and Specifications by additions, deletions, clarifications, or corrections**

(b) **Engineer – The design professional, including an architect, that has contracted with the Authority to design the Project and administer the Contract on behalf of the Authority. If no Project Engineer is designated all duties and responsibilities which the Engineer would otherwise have shall be the duties and responsibilities of the Authority.**

(c) **Authority – The Northern Virginia Regional Park Authority.**

(d) **Change Order – A written order to the Contractor authorizing an addition, deletion or revision in the Work within the general scope of the Contract Documents or authorizing an adjustment in the Contract Price or Contract Time. A Change Order, which adjusts the Contract Price or Contract Time, must be signed by the Authority, Contractor and Engineer. A Change Order includes a Field Order, as hereafter defined.**

(e) **Construction Change Directive - A written order to the Contractor signed by the Authority directing an addition, deletion or revision in the Work within the general scope of the Contract Documents prior to an agreement between the Authority and the Contractor as to an adjustment in the Contract Price or Contract Time. Upon receipt of a Construction Changes Directive, the Contractor shall promptly proceed with the change in the Work described therein.**

(f) **Contract Sum – The total monies payable to the Contractor under the terms and Conditions of the Contract Documents.**

(g) **Contract Time – The specific date or the number of days stated in the Contract Documents or the Notice to Proceed for Substantial Completion of the Work.**

(h) **Contractor – Any person of entity who has a contract directly with the Authority for the performance of the Work or a part thereof.**

(i) **Day – A calendar day of 24 hours lasting from midnight one day to midnight the next day.**

(j) **Drawings – The graphic and pictorial part of the Contract Documents that show the characteristics and scope of the Work to be performed and that has been prepared by or for the Authority. The term is used interchangeably with the word "Plans" and includes Standard Details.**

(k) **Field Order – A written order issued by the Engineer or the Authority to the Contractor during construction effecting a change in the Work, but not involving an adjustment in the Contract Price or an extension of the Contract Time.**

(l) **Inspector – The authorized representative of the Authority assigned to make detailed inspection of any or all portions of the Work. The Inspector is authorized to stop the Work in accordance with Article 29.**

(m) **Notice of Award – The written notice of the acceptance of the Bid from the Authority to the successful Bidder.**

(n) **Special Conditions – General requirements that are unique to a particular Contract.**

(o) **Standard Details – Details showing standard products, methods, and materials contained within the Plans or other agency standards such as the current versions of the Fairfax County Public Facilities Manual or the Virginia Department of Highways and Transportation Road and Bridge standards and specifications.**

(p) **Specifications – Special Conditions, Standard Specifications and Standard Details.**

(q) **Subcontractor – An individual, firm or corporation having a direct contract with the Contractor or with any other subcontractor for the performance of a part of the Work at the site.**

Substantial Completion – That date as certified by the Engineer when the construction of the Project or a specified part thereof is sufficiently completed in accordance with the Contract Documents so that the Project or specified part can be utilized for the purposes for which it is intended and when the Contractor has received all final inspections and occupancy permits from the appropriate jurisdictions.

(r) **Supplementary General Conditions – Modifications to General Conditions required for the Project.**

(s) **Supplier – Any person or organization who supplies materials or equipment for the Work (including that fabricated to a special design) but who does not perform labor at the site.**

(t) **Work – Any and all labor, materials, equipment, and all obligations, duties, and responsibilities expressly stated or reasonably implied for the successful completion of the construction required by the Contract Documents. The Contractor's Work includes payment of all sales, consumer, use, and other similar taxes required by law.**

(u) **Written Notice – Any notice to any party of the Contract relative to any part of the Contract in writing and considered delivered and the service thereof completed when posted by mail to the party at its last given address, or delivered in person to the party or its authorized representative at the Project.**

Article 2: CONTRACT DOCUMENTS

(a) **The agreement entered into by the parties shall consist of the Form of Construction Contract, the Form of Proposal submitted by the Contractor, the Supplemental General Conditions, these General Conditions, the specifications and drawings, including all modifications thereof, all of which shall be referred to collectively as the "Contract Documents." The Form of Construction Contract shall be signed by the Authority and Contractor in as many original counterparts as may be mutually agreed upon. The Contract may be amended only by a written amendment to the Contract or a Change Order signed by both parties.**

(b) **The Contract Documents are complimentary and what is required by one shall be binding on the Contractor as if required by all. In the event of any inconsistency between the Contract Documents, Contractor shall provide the greater quality or quantity of Work with no increase in the Contract Sum. The intent of the Contract Documents is that the Contractor shall furnish all labor, materials, tools, equipment, utilities, transportation and incidental work necessary for the proper execution of the Work in accordance with, or reasonably inferable from, the Contract Documents. In the event of conflicts among the Contract Documents, the Authority may designate the written or drawn provision or feature which shall be used and no additions to or deductions from the Contract Sum, or modification to the Contract Time, shall result from the choice. In case of conflicts, the Contract Documents shall take precedence in the following order: the Construction Contract; The Supplemental General Conditions; the General Conditions; the Special Conditions; the specifications; and the drawings.**

(c) **This Contract is an entire and integrated agreement and is not severable.**

(d) **Contractor shall identify in writing to the Authority and the Engineer, as soon as possible, any discrepancies, errors, omissions and/or inconsistencies or ambiguities, discovered by the Contractor in the Contract Documents. Work done by the Contractor after its discovery of such discrepancies, errors, omissions and/or inconsistencies or ambiguities and prior to response from the Engineer shall be done at the Contractor's sole risk and cost.**

Article 3: LAWS AND REGULATIONS

(a) In the performance of the Work, the Contractor shall comply with the requirements of all local, state and federal laws, codes, statutes, ordinances, rules, regulations and lawful orders of any public authority relating to the performance of the Work (the "Legal Requirements").

(b) All Contractors and Subcontractors for the Project must be properly licensed under the laws of the Commonwealth of Virginia and in good standing before submitting any bid and before commencing any Work. Upon the request of the Authority, any Contractor or Subcontractor for the Project shall promptly provide proof of its licensure.

(c) The Contract and all other contracts and subcontracts are subject to the provisions of Article 3 and 5, Chapter 4, Title 40.1, Code of Virginia, 1950, as amended, relating to labor unions and the "right to work," and all Contractors or Subcontractors, whether residents or nonresidents of the Commonwealth, who perform any work related to the project shall comply with all of the provisions of these code sections.

(d) The Contractor shall furnish the Authority copies of affidavits upon request giving the original dates, renewal dates and expiration dates of all labor contracts related to any phase of the work to be performed on the project site under this Contract.

(e) Contractor shall comply with all local, state and federal safety codes, statutes, rules, practices and regulations.

(f) EQUAL OPPORTUNITY EMPLOYMENT

(1) During the performance of the Agreement, the Contractor agrees as follows:

(i) The Contractor shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability or other basis prohibited by federal or state law relating to discrimination in employment, except where there is a bona-fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

(ii) The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, shall state that Contractor is an equal opportunity employer.

(iii) Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the notice, advertisement, and solicitation requirements of this paragraph.

(2) The Contractor shall cause to be included the provisions of the foregoing paragraphs a.(i), a.(ii) and a.(iii) (substituting the subcontractor or vendor for Contractor as the obligated party) in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each subcontractor or vendor.

(g) DRUG-FREE WORKPLACE

(1) During the performance of the Agreement, the Contractor agrees to (i) provide a drug-free workplace for the Contractor's employees, (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition, (iii) state in all solicitations or advertisements for employees placed by or on behalf of the Contractor that the Contractor maintains a drug-free workplace, and (iv) cause to be included the provisions of the foregoing clause (substituting the subcontractor or vendor for the Contractor as the

obligated party) in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each subcontractor or vendor.

(2) For the purposes of this section, "drug-free workplace" means a site for the performance of work done in connection with the Agreement by Contractor where its employees are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the Agreement.

(h) NO EMPLOYMENT OF UNAUTHORIZED ALIENS

Contractor represents and warrants that Contractor does not, and shall not during the performance of this Agreement, knowingly employ any unauthorized alien as defined in the Federal Immigration Reform and Control Act of 1986.

(i) STATEMENT OF NONDISCRIMINATION AGAINST FAITH-BASED ORGANIZATIONS

The Authority does not discriminate against faith-based organizations. (See Va. Code § 2.2-4343.1).

(j) PROMPT PAYMENT REQUIREMENTS

Within seven days after Contractor receives amounts paid for work subject to the Agreement performed by any "subcontractor," as defined in Code of Virginia § 2.2-4347, Contractor shall take one of the two following actions:

(1) Pay the subcontractor for the proportionate share of the total payment received from Owner attributable to the work performed by the subcontractor; or

(2) Notify Owner and the subcontractor in writing of Contractor's intent to withhold all or part of the subcontractor's payment and the reason for nonpayment.

(k) Contractor shall provide its Federal employer identification number with each application to Owner for payment.

(l) Contractor shall pay interest to any "subcontractor" on all amounts owed by Contractor that remain unpaid after seven days following receipt by Contractor of payment from Owner for work performed by such subcontractor relating to the Agreement except as to amounts withheld as retainage.

(m) Contractor shall include in its subcontracts a provision requiring each subcontractor to include or otherwise be subject to the same payment and interest requirements with respect to each lower-tier subcontractor.

(n) No obligation imposed by this section shall be construed to create any obligation of Owner under Code of Virginia § 2.2-4354, no modification to the Agreement may be made for the purpose of providing reimbursement for the interest charge, and Contractor shall not invoice Owner for any such charge.

(o) LIMITATION ON OWNER'S LIABILITY FOR INTEREST

Owner shall not be liable to pay any interest to Contractor under any circumstance except in the case of amounts that Owner does not dispute to be due and payable to Contractor; interest shall accrue beginning on the 60th day after payment is due at a rate of 3% per annum.

(p) AUTHORIZATION TO CONDUCT BUSINESS IN VIRGINIA

The provisions of Va. Code § 2.2-4311.2 are incorporated by reference. If Contractor is a business entity described in Va. Code § 2.2-4311.2.A, Contractor must be authorized to transact business in Virginia if required by law to be so authorized and shall not allow its existence or certificate authority or registration to transact business to lapse or be revoked or cancelled during the term of the contract.

Article 4: CONDITIONS AT SITE OR STRUCTURE

(a) All Bidders and Contractors shall visit the site and shall be responsible for having ascertained pertinent local conditions such as location, accessibility and general character of the site or building, and the character and extent of existing work within or adjacent to the site and to compare those conditions with the Contract Documents and the Legal Requirements. Claims, as a result of the Bidder's and/or Contractor's failure to comply with the foregoing, will not be considered by the Authority and are waived by the Contractor.

If in the performance of the Contract the Contractor discovers subsurface or latent conditions at the site that are materially different from those typical for the locality or indicated in the Contract Documents, the Contractor shall report the conditions to the Engineer and the Authority in writing before the conditions are disturbed. Upon such notice, or upon its own observation of such conditions, the Engineer shall promptly make such recommendations as it finds necessary to address the different conditions. Any change in the cost of the work or time needed for completion must be processed pursuant to the requirements of the Contract Documents.

Article 5: EXPLANATION TO BIDDERS

No oral explanation in regard to the meaning of drawings and specifications will be made and no oral instructions will be given before the award of the contract. Bidders shall identify in writing to the Authority and the Engineer any believed discrepancies, omissions, ambiguities or errors in the Contract Documents. Bidders must submit such a writing at least six (6) days prior to the time set for the receipt of bids to allow a sufficient time for a reply to reach them before the submission of their bids, but if there are two (2) weeks or less between the first bid advertisement and the time set for receipt of bids, then bidders may act up to three (3) days prior to the time set for receipt of bids. Any interpretation made will be in the form of an addendum to the specifications, which will be forwarded to all bidders, and its receipt by the bidder shall be acknowledged on the Bid Form.

Article 6: PREPARATION AND SUBMISSION OF BIDS

(a) Bids shall be submitted in duplicate on the forms furnished, or true copies thereof, and shall be signed in ink. Erasures or other changes in a bid shall be explained or noted over the signature of the bidder. Bids containing any conditions, omissions, unexplained erasures, alterations or items not called for in the proposal, or irregularities of any kind, may be rejected by the Authority as being incomplete.

(b) Each bid must give the full business address and contact information for the bidder and must be signed by a person with authority to bind the bidder. Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by one of the members of the partnership or an authorized representative, followed by the signature and designation of the person signing. Bids by corporations must be signed with the legal name of the corporation followed by the name of the state in which they are incorporated and by the signature and designation of the president, secretary or other person authorized to bind it in the matter. The name of each person signing shall also be typed or printed below the signature. A bid by a person who affixes to its signature the word "President," "Secretary," "Agent," or other designation without disclosing its principal, may be held to be the bid of the individual signing. When requested by the Authority, satisfactory evidence of the authority of the officer signing on behalf of the corporation shall be furnished.

(c) Bids with the bid guarantee shall be enclosed in a sealed envelope, which shall be marked and addressed as indicated by the advertisement or invitation to bid. Prior to submitting a bid, the bidder must be in compliance with and have the licenses required under Virginia Code Section 54.1-

1100, et seq. The bidder shall place on the outside of the envelope containing the bid and shall place in the bid over its signature whichever of the following notations is appropriate, inserting its Contractor license number.

If the bidder shall fail to provide this information on its bid or on the envelope containing the bid and shall fail to promptly provide the Contractor license number to the Authority in writing when requested to do so before the opening of bids, its bid will not be considered.

(d) The owner reserves the right to disqualify any Contractor and refuse to accept the bid of any bidder which has been convicted, or entered a plea of guilty or nolo contendere in any federal or state court to any charge involving any unlawful, corrupt or collusive practice involving a public contract either federal, state, or local or which has been determined in any judicial proceeding to have violated any antitrust, bid-rigging or collusive practice statute in connection with any public contract, or against whom such formal criminal prosecution or other judicial proceeding has been initiated.

Article 7: BID GUARANTEE

(a) Any bid exceeding Five Hundred Thousand Dollars ($500,000) shall be accompanied by a bid guarantee of not less than five percent (5%) of the amount of the bid, which may be certified check or cashier's check, or a Bid Bond made payable to the Authority. Bid Bonds shall be submitted on AIA Document A310. Such Bid Bond or check shall be submitted with the understanding that it shall guarantee that the bidder will not withdraw its bid during the period up to and including ninety (90) days following the opening of bids; that if its bid is accepted, it will enter into a formal contract with the Authority in accordance with the Form of Construction Contract included as a part of the Contract Documents, and that the referenced Performance Bond and Labor and material Payment Bond will be given; and that in the event of the withdrawal of the bid within the period, or failure to enter into the contract and give the bonds within ten (10) days after it has received notice of acceptance of its bid, the bidder shall be liable to the Authority for the difference between the amount of the bidder's bid and the amount of the bid for the next higher bidder to perform the Work but such amount shall not exceed the amount of the bid guarantee.

(b) The Bid Bonds and checks will be returned to all except the three lowest bidders after the formal opening of the bids. The remaining Bid Bonds and checks will be returned to the lowest bidders after the Authority and the accepted bidder have executed the Contract and the Performance Bond and the Payment Bond have been approved by the Authority.

(c) If the required Contract and bonds have not been executed within ninety (90) days after the date of the opening of the bids, then the bond or check of any bidder will be returned upon its request, provided it has not been notified of the acceptance of the bid prior to the date of such request.

Article 8: WITHDRAWAL OR MODIFICATION OF BIDS

A bidder may withdraw or modify its bid only by written notice delivered to the Authority prior to the time fixed for receipt of bids.

Article 9: RECEIPT AND OPENING BIDS

(a) It is the responsibility of the bidder to assure that its bid is delivered to the place designated for receipt of bids and prior to the time set for receipt of bids. The Authority will not consider bids received after the time set for receipt of bids.

(b) Bids will be opened at the time and place stated in the advertisement and the lowest bidder will be announced. The officer or agent of the Authority, whose duty it is to open the bids, will decide when the specified time has arrived. No responsibility will be attached to any officer or agent for the premature opening of a bid not properly addressed and identified.

Article 10: ERRORS IN BIDS

A bidder may withdraw its bid from consideration if the price bid was substantially lower than the other bids due solely to a mistake in the bid, provided the bid was submitted in good faith, and the mistake was a clerical mistake as opposed to a judgment mistake, and was actually due to an unintentional arithmetic error or an unintentional omission of quantity of work, labor or material made directly in the complication of a bid, which unintentional arithmetic error or unintentional omission can be clearly shown by objective evidence drawn from inspection of original work papers, documents and materials used in the preparation of the bid sought to be withdrawn. Under this provision a bidder requesting to withdraw its bid shall follow the procedures set forth in Section 2.2-4330 of the Code of Virginia. The bidder must give notice in writing of its claim of right to withdraw its bid within the time frame required by Section 2.2-4330 of the Code of Virginia and shall submit its original work papers to the Authority in compliance with the requirements of Section 2.2-4330 of the Code of Virginia. Failure to strictly comply with the requirements of Section 2.2-4330 of the Code of Virginia shall constitute a waiver of the right to withdraw the bid.

No bid may be withdrawn when the result would be the awarding of the Contract on another bid of the same bidder. No bidder who is permitted to withdraw a bid shall for compensation supply any material or labor to or perform any subcontract or other work agreement for the person or firm to whom the contract is awarded or otherwise benefit, directly or indirectly, from the performance of the project for which the withdrawn bid was submitted, without the approval of the Authority. The person or firm to whom the Contract was awarded and the withdrawing bidder are jointly liable to the Authority in an amount equal to any compensation paid to or for the benefit of the withdrawing bidder without such approval.

If a bid is withdrawn under authority of this section, the next higher bidder shall be deemed to be the low bidder on the project.

Article 11: REJECTION OF BIDS

The Authority reserves the right to reject any and all bids when such rejection is in the interest of the Authority, and will reject the bid of a bidder who is not a responsible bidder. (See § 2.2-4319, Code of Virginia, 1950, as amended.)

Article 12: STANDARD FORMS

The copies of the Form of Construction Contract, and AIA Document A312, Performance Bond and the Labor and Material Payment Bond are incorporated into the General Conditions by reference and are made a part hereof to the same extent as though fully set forth herein.

Article 13: AWARD OF CONTRACT

(a) **The Contract will be awarded as soon as possible to the lowest responsive and responsible bidder, provided its bid is reasonable and it is in the interest of the Authority to accept it. The Authority reserves the right to waive any informality in bids received when such waiver is in the interest of the Authority; also to accept any item in the bid unless otherwise specified by the Authority. Each bidder shall be prepared, if so requested by the Authority, to present evidence of its experience, qualifications and financial ability to carry out the terms of the Contract.**

(b) **If the bid forms contain alternate prices, the Authority may in its sole discretion, unless otherwise specified in the invitation for bid, select whatever alternates it chooses to accept subsequent to the bid opening but prior to the determination of the low bidder. The low bidder shall be determined by comparing each bidder's bid total based on the sum of the base bid and the alternates selected by the Authority.**

(c) **Pursuant to the Virginia Public Procurement Act, in the event the lowest responsible bid exceeds available funds for the project, the Authority may enter into negotiations with the lowest responsible bidder in an effort to arrive at a contract amount within the limits of available funds. In such event, the Authority will inform the bidder of the amount of funds available, and will negotiate in good faith toward achieving the funding limit, preferably without any change in the scope or other change in the Contract Documents. However, negotiations may include change in scope, quantity of materials, or other changes, so long as any such changes are within the general scope of the original design. If the Authority and bidder reach agreement, the Authority may award a contract in accordance with procedures or actions approved by the Authority Board. The Authority may terminate negotiations**

at any time prior to the award of a contract, and proceed as otherwise permitted by the Virginia Public Procurement Act.

Article 14: CONTRACT SECURITY

For all contracts of Five Hundred Thousand Dollars ($500,000.00) or more, the Contractor shall deliver to the Authority or its designated representative, an AIA Document A312, Performance Bond and Labor and Material Payment Bond, each fully executed by one or more surety companies legally authorized to do business in Virginia and each in an amount equal to one hundred percent (100%) of the original Contract Sum. The bonds shall be conditioned as set forth in § 2.2-4337 of the Code of Virginia, as amended. Sureties shall be selected by the Contractor subject to approval by the Authority. No contract shall be deemed to be in effect until the bonds have been approved by the Authority. For the purposes of all Labor and Material Payment Bonds entered into pursuant to this Article, the term "subcontractors" as used in § 2.2-4337 A.2 of the Code of Virginia is interpreted to mean any contractors who participated in the prosecution of the Work undertaken by the Contractor, whether such subcontractor had a direct contract with the Contractor or whether there were one or more other intervening subcontractors.

Article 15: PROGRESS SCHEDULES

(a) The Contractor shall, within ten (10) days of receipt of notice of award, prepare and submit to the Authority and Engineer a schedule for the completion of the Work within the timeframe set forth in the Contract Documents. This progress schedule shall be related to the entire Project; shall include all the Work; and shall meet the time for completion requirements of the Contract. It shall include an allowance for anticipated delay caused by ordinary adverse weather conditions and shall provide for the expeditious and practical execution of the Work within the time requirements of the Contract Documents. The schedule shall set forth as much detail as deemed necessary by the Authority.

(b) The Authority's acceptance of the schedule is not a representation or agreement that the schedule is logical or can be performed in the time or sequence indicated, but only that the Authority approves of the construction in that time and in that sequence.

Article 16: SHOP DRAWINGS, PRODUCT DATA and SAMPLES

(a) Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or any Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

(b) Product Data are illustrations, standard schedules, performance charts, instruction, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of Work.

(c) Samples are physical examples, which illustrate materials, equipment or workmanship and establish standards of quality and esthetics by which the Work will be judged.

(d) The Contractor shall review, approve and submit, with reasonable promptness and in such sequence as to cause no delay in the Work or in the work of the Authority or any separate contractor, all Shop Drawings, Product Data and Samples required by the Contract Documents.

(e) By preparing and submitting Shop Drawings, Product Data and Samples, the Contractor represents that it has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that it has checked and coordinated the information contained within such submittals with the requirements of the Work and the Contract Documents.

(f) The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Engineer's approval of Shop Drawings, Product Data or Samples unless the Contractor had specifically informed the Engineer in writing of such deviation at the time of submission and the Engineer has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility of errors or omissions in the Shop Drawings, Product Data or Samples by the Engineer's approval thereof.

(g) **The Contractor shall direct specific attention, inviting or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Engineer on previous submittals.**

(h) **No portion of the Work requiring submission of a Shop Drawing, Product Data or Sample shall be commenced until the submittal has been approved by the Engineer. All such portions of the Work shall be in accordance with approved submittals.**

Article 17: MATERIALS, SERVICES, AND FACILITIES

(a) **Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the work. Stored materials and equipment to be incorporated in the Work shall be located so as to facilitate prompt inspection.**

(b) **Manufactured articles, materials, and equipment shall be stored, applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer, and as approved by the Engineer.**

(c) **Materials, supplies, and equipment shall be in accordance with samples, shop drawings, and catalogue cuts submitted by the Contractor and approved by the Engineer and Authority.**

(d) **Materials, supplies, or equipment to be incorporated into the work shall not be purchased by the Contractor or the Subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.**

(e) **All Work included in this Contract shall be performed to the standards specified. The Contractor shall employ no plant, equipment, materials, methods or persons to which the Engineer or the Authority reasonably objects, and shall remove no plant, equipment or other facilities from the site of the work without permission of the Engineer and the Authority. The Contractor's failure to comply with these requirements will constitute a breach of Contract and as such may result in a termination of the Contractor by the Authority.**

Article 18: INSPECTION AND TESTING

(a) **All materials and equipment used in the construction of the Project shall be subject to adequate inspection and testing in accordance with generally accepted industry standards and the Legal Requirements as defined in the Contract Documents.**

(b) **If the Contract Documents or the Legal Requirements require any part of the Work to specifically be inspected, tested or approved by someone other than the Contractor, the Contractor shall initiate and coordinate those inspections, test, or approvals with the proper authorities and shall give the Engineer and the Authority three (3) working days written notice of each such inspection. The Contractor shall then furnish the Engineer and the Authority with the required certificates of inspection, testing or approval. Unless otherwise specifically provided for, the Contractor shall bear all costs of such inspections, tests or approvals.**

(c) **Inspection, test, or approvals by the Engineer or others will not relieve the Contractor from its obligations to perform the Work in accordance with the requirements of the Contract Documents.**

(d) **The Authority, the Engineer and their representatives shall at all times have access to the Work. In addition, authorized representatives and agents of any participating federal, state or local agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. All such records shall remain available and accessible during performance of the Contract and until three years from the date of Final Payment, or, in case of dispute, for a period of three years after resolution of the dispute, whichever is later. The Contractor shall provide proper facilities for such access and observation of the Work and also for any inspection or testing thereof.**

(e) **If any work is covered without the approval of the Engineer contrary to requirements of the Contract Documents, it must, if requested by the Engineer or the Authority, be uncovered for its observation and then recovered at the Contractor's expense.**

(f) **If the Engineer or the Authority considers it necessary or advisable that approved covered work be inspected or tested by others, the Contractor, at the Engineer's or the Authority's request, shall uncover, expose or otherwise make that portion of the Work available for observation, inspection or testing as the Engineer or the Authority may require. If it is found that such work is defective, the Contractor will bear all the expenses of such uncovering, exposure, and observation as well as all expenses for the inspection, testing, and satisfactory reconstruction of that portion of the Work. If, however, such work is not found to be defective, the Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time or both, directly attributable to such uncovering, exposure, observation, inspection, testing, and reconstruction, and an appropriate Change Order will be issued.**

Article 19: SUBSTITUTIONS

(a) **After the Contract has been executed, the Authority and the Engineer will consider a written request for the substitution of products or materials specified by the Contract Documents. The Authority is not obligated to consider substitutions and such consideration is the Authority's sole discretion. By making requests for substitutions, the Contractor represents and certifies:**

(1) **that the Contractor has personally investigated the proposed substitute product or material and determined that it is equal or superior in all respects to that specified by the Contract Documents.**

(2) **that the Contractor will provide the Authority with a warranty of the substituted product equal or superior to the warranty furnished in connection with the product or material originally specified by the Contract Documents.**

(3) **that the cost data presented is complete and includes all related costs under this Contract and Contractor waives all claims for any additional costs related to the substitution; and**

(4) **that the Contractor will coordinate the installation of the substituted product or material and that the Contractor will make all changes necessitated by the use of the substituted product without any additional cost to the Authority.**

Article 20: PATENTS

The Contractor shall pay all applicable royalties and license fees. It shall defend all suits or claims for infringement of any patent rights and save the Authority harmless from loss on account thereof, except that the Authority will be responsible for any such loss when a particular process, design or the product of a particular manufacturer or manufacturers as specified is an infringement of a patent. However, if the Contractor has reason to believe that such particular process, design or product is an infringement, he shall be responsible for such loss unless he gives written notice to the Authority and the Engineer of the possible infringement.

Article 21: SURVEYS, PERMITS, REGULATIONS

(a) **The Authority will furnish all boundary surveys and establish all baselines for locating the principal component parts of the Work together with suitable number of benchmarks adjacent to the Work as shown in the Contract Documents.**

(b) **Permits and licenses of a temporary nature necessary for the prosecution of the work, such as building, plumbing, and electrical permits, shall be secured and paid for by the Contractor unless otherwise stated in the Contract Documents. Permits, licenses, and easements for permanent use of structures or permanent changes in existing facilities shall be secured and paid for by the Authority unless otherwise specified.**

(c) **The Contractor shall give all notices and comply with all permits and the Legal Requirements in the performance of the Work. The Contractor shall promptly notify the Engineer in writing if it comes to its attention that the Contract Documents are at variance with any such requirement.**

(d) **If any permit, license or certificate expire, be revoked, terminated or suspended because of any act or omission of the Contractor, it shall not be entitled to any additional compensation for direct costs or to an extension of the Contract Time.**

(e) **Permits obtained by the Authority for this Project are available for inspection in the Authority's offices.**

Article 22: PROTECTION OF WORK, PROPERTY AND PERSONS

(a) **The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work, in compliance with industry standards and the Legal requirements. Contractor shall take all necessary precautions for the safety of and shall provide the necessary protection to prevent damage, injury or loss to all employees on the work and other persons who may be affected thereby, all the work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation or replacement in the course of construction. In case of suspension of work for any cause whatever, the contractor shall be responsible for the Project and shall take such precautions as may be necessary to prevent damage to the Work, provide for proper drainage and shall erect any necessary temporary structures, signs, or other facilities at its expense. During such period or suspension of work, the Contractor shall properly and continuously maintain in acceptable growing condition all living material in newly established plantings, seedings, and sodding furnished under this Contract, and shall take adequate precautions to protect new growth and other important growth against injury. Contractor shall also notify owners of adjacent utilities when prosecution of the Work may affect them.**

(b) **In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor shall act, at its discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in the Contract Documents.**

Article 23: SUPERVISION BY CONTRACTOR

(a) **The Contractor shall supervise and direct the work. It shall be solely responsible for the means, methods, techniques, sequencers and procedures of construction. The Contractor shall employ and maintain on the work a qualified supervisor or superintendent ("Supervisor") and provide a resume of its experience. This Supervisor shall have been designated in writing as the Contractor's representative at the site and shall not thereafter be changed unless such change is approved by or directed by the Authority. The Authority shall have the right to approve this Supervisor or order its removal from the job site, which right shall not be unreasonably exercised. This Supervisor shall have full authority to act on behalf of the Contractor and all communications given to the Supervisor shall be as binding as if given to the Contractor. This Supervisor shall be present on the site at all times as required to perform adequate supervision, control and coordination of the Work as determined by the Engineer or the Authority.**

(b) **The Contractor shall be responsible to the Authority for the acts and omissions of its employees, Subcontractors and their agents and employees, and other persons performing any of the Work under a contract with the Contractor.**

(c) **The Contractor shall not be relieved from its obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Engineer and the Authority in their administration of the Contract or by inspections, tests, or approvals required or performed by persons other than the Contractor.**

(d) **Prior to commencing work, the Contractor shall check all work performed by others that is necessary for the execution of the Contractor's work and shall promptly report to the Engineer in writing any deficiencies in such work which render it unacceptable or unsuitable for the Contractor's Work or which will increase the cost of the Work. Failure to give such written notice shall relieve the Authority of any responsibility therefore. The Contractor shall be responsible for all elevations, grades, and proper fitting of its Work.**

Article 24: CHANGES IN THE WORK

(a) **The Authority, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, with the Contract Sum and the Contract Time being adjusted accordingly. All such changes in Work shall be authorized by written Change Order signed by the Authority and the Engineer, and shall be performed under the applicable conditions of the Contract Documents.**

(b) **The cost or credit to the Authority resulting from a change in the Work shall be determined in one or more of the following ways:**

(1) **by mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;**

(2) **by unit prices stated in the Contract Documents or subsequently agreed upon;**

(3) **by cost to be determined in a manner agreed upon by the parties and a combined overhead and profit of 15% of such costs if the Contractor performs the work with its own forces, or 15% for the combined overhead and profit of a Subcontractor performing the work with its own forces and 5% for the Contractor; in no event shall the total mark-up for overhead and profit exceed 20% of the cost; or**

(4) **by the method provided in Article 25(c).**

(c) **If none of the methods set forth above is agreed upon, the Contractor, provided it receives a Construction Change Directive signed by the Authority, shall promptly proceed with the Work involved. The cost of such Work shall then be determined by the Engineer on the basis of the reasonable expenditures and savings of those performing the Work attributable to the change, including, in the case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. In such case, and also under Article 25(b(3) above, the Contractor shall keep and present, in such form as the Engineer may prescribe, an itemized accounting together with appropriate supporting data of the costs for inclusion in a Change Order. Unless otherwise provided in the Contract Documents, costs shall be limited to the following: cost of materials, including sales tax and cost of delivery,, cost of labor, including social security, unemployment insurance, and fringe benefits required by agreement or custom; workers' or workmen's compensation insurance; bond premiums; and rental value of equipment and machinery. The amount of credit to be allowed by the Contractor to the Authority for any deletion or change that results in a net decrease in the Contract Sum will be the amount of the actual net cost as confirmed by the Engineer. When both additions and credits covering related Work or substitutions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net increase, if any, with respect to that change.**

(d) **The Engineer or the Authority also may at any time by issuing a Field Order, make changes in the details of the Work. The Contractor shall proceed with the performance of any changes in the work so ordered and should the Contractor believe that such Field Order entitles it to a change in Contract Price or Time, or both, it shall give the Engineer and the Authority Written Notice thereof within ten days after the receipt of the Field Order. Failure to provide such written notice shall be deemed a waiver of any claims arising from or relating to the Field Order. Failure to proceed with work changed by a Field Order or a Change Order shall constitute a breach of contract and shall be cause for the termination of the Contract. All requests for a Change Order arising out of a Field Order must have a copy of the referenced Field Order attached.**

(e) **Where the Work is contracted for on a unit price basis and the actual quantity of work for any pay item exceeds the estimated quantity by more than 25% of that amount stated in the Contract Documents, a Change Order will be issued for any increase or decrease in unit cost, which results from the increased work. If the quantity variation is such as to cause an increase in the time necessary for completion, the Authority shall, upon receipt of a written request for an extension of time, make an appropriate adjustment for extending the completion date in accordance with Article 26.**

Article 25: CHANGES IN THE CONTRACT SUM OR OTHER RELIEF

(a) **If the Contractor wants to make a claim for an increase in the Contract Sum, or for any other relief under the Contract, it shall give the Engineer and the Authority written notice of the claim within ten (10) days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute any additional Work, except in an emergency endangering life or property. The notice shall set forth the basis for the claim and the relief or increase in the Contract Sum requested by the Contractor. After providing notice of its claim, Contractor shall provide the Authority and the Engineer with any information and/or documents requested by them to evaluate the claim. No such claim shall be valid unless so made. If the Authority and the Contractor cannot agree on the amount of the adjustment in the Contract Sum, it shall be determined by the Engineer in accordance with Article 40(e). Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.**

(b) **If the Contractor claims that additional cost is required because of, but not limited to,**

(1) **any written interpretation of the Contract Documents;**

(2) **any order by the Authority to stop the Work where the Contractor was not at fault; or**

(3) **any Field Order directed change in the Work; the Contractor shall make such claim as provided in Article 25(a).**

Article 26: TIME FOR COMPLETION AND LIQUIDATED DAMAGES

(a) **All time limits stated in the Contract Documents are of the essence of the Contract.**

(b) **The Contractor shall proceed with the Work with the diligence necessary to insure Substantial Completion within the Contract Time. It is expressly understood and agreed by and between the Contractor and the Authority that the Contract Time for the completion of the Work described herein is a reasonable and adequate time, taking into consideration the average climate and economic conditions and other factors prevailing in the locality of the Work.**

(c) **If the Contractor shall fail to Substantially Complete the Work within the Contract Time, or extension of time granted by the Authority, then the Contractor shall pay to the Authority liquidated damages as specified in the Contract Documents for each calendar day after the date of Substantial Completion until the Work achieves Substantial Completion. Contractor agrees that the amount of liquidated damages is reasonable and waives any right it may have to contest the amount of liquidated damages as being unreasonable or a penalty. If liquidated damages are not set forth in the Contract Documents, Contractor shall be liable to Owner for any loss or damage arising from the Contractor's failure to complete the Work by the date of Substantial Completion.**

(d) **If the Contractor is delayed at any time in the progress of the Work by any act or neglect of the Authority or the Engineer, or by any employee of either, or by any separate contractor employed by the Authority, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in transportation, unusual and adverse weather conditions that could not be reasonably anticipated, unavoidable casualties, or any causes beyond the Contractor's control, or by delay authorized by the Authority, then the Contract Time shall be extended by Change Order for such reasonable time as the Engineer may determine.**

(e) **Any claim for extension of time shall be made in writing to the Engineer and the Authority within (10) days after the commencement of the event giving rise to or causing the claimed delay; otherwise it shall be waived. The notice shall set forth the basis for the extension of time and any other relief requested by the Contractor. After providing notice of its claim, Contractor shall provide the Authority and the Engineer with any information and/or documents requested by them to evaluate the claim. In the case of a continuing delay only one notice of claim is necessary. The Contractor shall precisely identify the delay and its cause, and provide an estimate of the probable effect of such delay on the progress of the Work.**

(f) **Contractor hereby expressly waives any claims against the Authority and the Engineer for any indirect or direct damages, costs or expenses which the Contractor or its Subcontractors may incur as a result of any delay in the performance of the Contract, except and then only to the extent that**

the delay is caused by any act or omission of the Authority or the Engineer, or their agents or employees, and is due to causes within their control. In such event, Contractor may seek direct costs arising solely from the delay but shall not be entitled to any indirect costs including, without limitation, home office overhead costs. It is understood and agreed that the Contractor's sole and exclusive remedy in case of any noncompensable delay shall be an extension of the Contract Time, but only as determined in accordance with the provisions of the Contract Documents.

(g) In the event that Contractor has incurred a delay for which it believes it is entitled to compensation under this Contract, it shall give the Authority written notice of that claim within ten (10) days of the commencement of the delay, and shall identify what it considers to be the cause of and expected duration of the delay.

Article 27: CORRECTION OF WORK

(a) The Contractor shall promptly remove from the premises all work rejected by the Engineer or the Authority for failure to comply with the Contract Documents whether incorporated in the construction or not, and the Contractor shall promptly replace and re-execute the work in accordance with the Contract Documents and without expense to the Authority and shall bear the expense of making good all work of other Contractors destroyed or damaged by such removal or replacement.

(b) Unauthorized work shall be any work done or materials ordered by the Contractor prior to receipt of the Notice to Proceed, previously rejected work incorporated into the Project, work done contrary to or regardless of the instructions of the Engineer, extra work performed without proper written authority, work done beyond the limits shown on the Plans, except as herein specified, any extra work done without written authority from the Engineer or the Authority, or any work done after discovery of a discrepancy, ambiguity, or inconsistency and before the Engineer provides any necessary instructions to the Contractor. The Authority shall not pay for unauthorized work. Unauthorized work may, at the Authority's sole discretion, be ordered removed or replaced at the Contractor's expense.

Article 28: SUSPENSION OF WORK; THE AUTHORITY'S RIGHT TO STOP AND CARRY OUT THE WORK

(a) The Authority may order the Contractor in writing to suspend, delay, or interrupt all or any part of the Work for such period of time as it may determine to be appropriate for the convenience of the Authority.

(b) <u>The Authority's Right to Stop the Work</u>

If the Contractor fails to correct defective Work as required, fails to carry out the Work in accordance with the Contract Documents, or if an emergency situation exists that threatens the safety of persons or property, the Authority, in addition to any other remedies it may have, by a written notice direct the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated. Contractor shall be liable to the Authority for any loss of damages arising from the stoppage of the Work including, without limitation, any loss or damage arising from a delay in the completion of the Work.

(c) <u>Authority's Right to Carry Out the Work</u>

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within two (2) days after receipt of written notice from the Authority to commence and continue correction for such default or neglect with diligence and promptness, the Authority may, after two (2) days following receipt by the Contractor of an additional written notice of its decision to do so, make good such deficiencies without prejudice to any other remedy it may have. In such case an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the Engineer's additional services or other services as may be required and made necessary by such default, neglect or failure. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Authority. All charges and back charges made against monies otherwise owed to or due to the Contractor shall be deemed accepted

unless the Contractor rejects them in writing to the Authority within ten (10) days of receipt and states fully its reasons for rejecting them.

Article 29: TERMINATION

(a) **If the Contractor is adjudged a bankrupt or insolvent, or if it makes a general assignment for the benefit of its creditors, or if a trustee or receiver is appointed for the Contractor or for any of its property, or if it files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if it fails to supply sufficient skilled workmen or suitable materials or equipment, or if it fails to make prompt payments to subcontractors or for labor, materials or equipment, or if it refuses or fails to prosecute the Work or any separable part thereof, with such diligence as will insure its completion within the Contract Time, or if it fails to complete the Work within the Contract Time required, or if it disregards laws, ordinances, rules, regulations, directions or orders of any public body having jurisdiction over the Work, or if it disregards the authority of the Engineer, or if it otherwise violates any provision of the Contract Documents, then the Authority may, without prejudice to any other right or remedy, seven (7) days after delivery of a written notice to the Contractor and its surety, terminate the services of the Contractor and take possession of the Project and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor, and finish the Work by whatever method it may deem expedient. In such case, the Contractor will not be entitled to receive any future payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the Project, including compensation for additional professional services, such excess will be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor shall pay the difference to the Authority. Such cost incurred by the Authority will be determined by the Engineer and incorporated in a Change Order.**

(b) **If termination for cause by the Authority is deemed to be improper, it shall be deemed a termination for convenience.**

(c) **Where the Contractor's services have been so terminated by the Authority, the termination shall not affect any rights the Authority then has or that may thereafter accrue against the Contractor. Any retention or payment of monies by the Authority due the Contractor will not release the contractor from compliance with the Contract Documents.**

(d) **<u>Termination for Convenience</u>**

The Authority may, effective not less than after seven (7) days from delivery of a written notice to the Contractor, without cause and without prejudice to any other rights or remedies it may have, terminate this Construction Contract for its own convenience for any reason. When this Construction Contract has been terminated for convenience, the Contractor shall be paid only for Work performed through the date of termination The Contractor shall not be entitled to anticipated profits on unperformed portions of the Work.

Article 30: USE OF THE PREMISES

(a) **The Authority will have the right to enter the premises for the purpose of doing work not covered by the Contract Documents. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the Work or the restoration of any damaged work, except such as may be caused by agents or employees of the Authority.**

(b) **Prior to Substantial Completion, the Authority, with the concurrence of the Contractor, may use any completed or substantially completed portion of the Work. Such use shall not constitute a final acceptance of such portions of the Work unless otherwise stated so in writing.**

Article 31: PAYMENTS TO THE CONTRACTOR

(a) **Prior to submitting its first application for payment, the Contractor shall submit to the Authority and the Engineer a schedule of values allocating the costs of the various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as may be required by the Authority and the Engineer. This schedule, as approved, shall be used as a basis for**

Contractor's applications for payment, which shall be submitted on the current edition of the AIA Application and Certification for Payment ("Application for Payment"), AIA Document G702.

(b) **At least twenty days before each progress payment falls due (but not more than once a month), the Contractor, the Engineer, and the Authority shall meet at the Project to determine the percentage of completion of the individual items in the schedule of values. If no agreement is reached, the Contractor shall prepare its Application for Payment using percentages it considers correct. Thereafter, the Contractor shall submit to the Engineer three (3) copies of its completed and signed Applications for Payment covering the work performed during the period of the Application for Payment and supported by such data as the Engineer may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the Work, the Application for Payment shall also be accompanied by such supporting data, satisfactory to the Engineer, as will protect the Authority's interests therein, including applicable insurance. See Article 32(c). The Engineer will, within fifteen days after receipt of each Application for Payment, either certify in writing its approval of payment for an amount based either on the agreed percentages of completion or the percentages the Engineer considers correct and present the Application for Payment to the Authority, or return the Application for Payment to the contractor stating in writing its reasons for refusing to approve payment. If payment has been refuse, the Contractor may make the necessary corrections and resubmit the Application for Payment to the Engineer. The Authority will, within thirty days of its receipt of an approved Application for Payment, pay the Contractor a progress payment in the amount certified by the engineer, unless the Authority has reason to refuse payment of that amount in whole or in part, in which event it shall state its reasons in writing to the Contractor. The Authority will retain five (5) percent of the amount of each payment due until final completion and acceptance of all work. However, the Authority may, in its sole discretion, reduce the amount retained to 150% of the value of work remaining when the work is substantially complete. The decision to reduce retainage and the amount of such reduction shall be solely that of the Authority. On completion and acceptance of a part of the Work on which the price is stated separately in the Contract Documents, payment may be made in full, including retained percentages less authorized deductions. Prior to receiving each payment, and as part of its Applications for Payment, the Contractor shall certify in writing that it has made payment from the proceeds of prior payments and that it will make timely payments form the proceeds of progress and final payment then due it, to its subcontractors and suppliers in accordance with its contractual arrangement with them. If requested by the Authority, the Contractor shall provide evidence of such payments, including affidavits by subcontractors and suppliers.**

(c) **The Application for Payment may also include an allowance for the cost of major materials and equipment not yet incorporated in the Work. When requested in writing by the Contractor and approved in writing by the Authority, payment will be made for nonperishable major material and equipment delivered and properly stored at the Work site or other approved site. Material for which payment has been made, wholly or partially, shall not be removed from the Work site or other approved site unless authorized by the Authority in writing.**

(d) **The Contractor shall indemnify and save the Authority and its agents harmless from all losses, damages, liabilities, including attorney's fees, arising out of the demands of Subcontractors, laborers, workmen, mechanics, materialmen and furnishers of machinery parts thereof, equipment, tools, and all supplies incurred in the furtherance of the performance of the Work. The Contractor shall, at the Engineer's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the Contractor fails to do so, the Authority may, after having notified the Contractor, either pay unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor will be resumed in accordance with the terms of the Contract Documents. In no event, however, shall the provisions of the foregoing sentence be construed to impose any obligations upon the Authority to either the Contractor, its Surety, or any third party. In paying any unpaid bills of the Contractor, any payment so made by the Authority will be considered as a payment made under the Contract Documents by the Authority to the Contractor and the Authority will not be liable to the Contractor for any such payments in good faith.**

(e) **If the Authority fails to make a payment when due under the terms of this Contract, interest shall accrue on monies due and owing at the rate of 3% per annum commencing sixty (60) days after the date the payment was due.**

(f) The Authority may reduce in whole or in part any approved Application for Payment, whether or not it has been paid, to the extent necessary to protect the Authority from loss because of:

(1) defective Work not remedied;

(2) failure to timely or properly pay Subcontractors;

(3) evidence that the Work cannot be completed for the amount remaining to be paid; or

(4) damage to the Authority;

(5) a persistent failure to carry out the Work in accordance with the Contract Documents.

Article 32: SUBSTANTIAL COMPLETION OF THE WORK

(a) When the Contractor considers that the Work or, if agreed to by the Authority, a designated portion thereof is Substantially Complete as defined in Article 1, the Contractor shall prepare for submission to the Engineer a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. When the Engineer on the basis of its inspection determines that the Work or designated portion thereof is Substantially Complete, it will then prepare a Certificate of Substantial Completion which shall establish the Date of Substantial Completion, shall state the responsibilities of the Authority and the Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance, and shall fix the time within which the Contractor shall complete the items listed therein. Warranties required by the Contract Documents shall commence on the Date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Authority and the Contractor for their written acceptance of the responsibilities assigned to them in such Certificate.

(b) Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Engineer, the Authority shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof, as provided in the Contract Documents.

Article 33: FINAL COMPLETION AND FINAL PAYMENT

(a) Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Engineer will promptly make such inspection and, when it finds the Work acceptable under the Contract Documents and the Contract fully performed, it will promptly issue a final Certificate for Payment stating that to the best of its knowledge, information, and belief, and on the basis of its observations and inspections, the Work has been completed in accordance with the terms and conditions of the Contract Documents and that the entire balance stated therein is due and payable to the Contractor. If the Contractor has completed all of the requirements and conditions, Final Payment shall be made within 30 days of receipt of the Contractor's Application. The Engineer's Final Certificate for Payment will constitute a further representation that the conditions precedent to the Contractor's being entitled to final payment as set forth in Article 32(b) have been fulfilled.

(b) Neither the final payment nor the remaining retained percentage shall become due until the Contractor submits to the Engineer (1) an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Authority or its property might in any way be responsible, have been paid or otherwise satisfied, (2) consent of surety, if any, to final payment, (3) if required by the Authority, other data establishing payment or satisfaction of all such obligations, such as receipts, release and waivers of liens arising out of the Contract, to the extent and in such form as may be designated by the Authority, (4) two (2) binders containing all product and equipment manuals, warranties and guarantees, and (5) as-built drawings. If any Subcontractor refuses to furnish a release or waiver required by the Authority, the Contractor may furnish a bond satisfactory to the Authority to indemnify it against any such lien. If any such lien remains unsatisfied after all payments are made, the Contractor shall refund to the Authority all

monies that the latter may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

(c) If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by the issuance of Change Orders affecting final completion, and the Engineer so confirms, the Authority shall, upon application by the Contractor and certification by the Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance of the Contract Sum is less than the retainage stipulated in the Contract Documents, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Engineer prior to certification of such payment. Such payment shall then be made under the terms and conditions governing final payment. However, that payment shall not constitute a waiver of any claims the Authority may then or thereafter have.

(d) The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing, properly reserved pursuant to these General Conditions, and identified by the Contractor as unsettled at the time of the final Application for Payment. Such contractual claims, whether form money or other relief, shall be submitted in writing not later than 60 days after final payment. The Authority's Capital Programs Director shall review such contractual claims and issue a final decision in writing within 90 days after receipt.

Article 34: INSURANCE

(a) <u>Contractor's Liability Insurance</u>

The Contractor shall purchase and maintain such insurance as will protect it from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

(1) claims under workers' or workmen's compensation, disability benefit and other similar employee benefit acts;

(2) claims for damages because of bodily injury, occupational sickness or disease, or death of its employees;

(3) claims for damages because of bodily injury, sickness or disease, or death of any person other than its employees;

(4) claims for damages insured by usual personal injury liability coverage, which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person;

(5) claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting there from; and

(6) claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

Liability insurance shall include all major divisions of coverage and be on a comprehensive basis including:

(1) Premises Operations (including X, C and U coverage);

(2) Independent Contractor's Protective;

(3) Products and Completed Operations;

(4) Personal Injury Liability with Employment Exclusions deleted;

(5) Contractual, including provisions for indemnity obligations under this Agreement;

(6) Owned, non-owned and hired motor vehicles;

(7) Broad Form Property Damage including Completed Operation

Contractor shall have and maintain the following insurance in the amounts set forth below unless otherwise agreed to by the Owner in writing:

(1) Workers' Compensation Insurance in an amount as required by state law. Workers' Compensation per statutory limits and employer's liability in the following minimum amounts: EL Each Accident - $500,000, EL Disease Policy Limit - $500,000, EL Disease Each Employee - $500,000.

(2) Commercial General Liability Insurance including coverage for bodily injury, property damage, contractual liability and products/completed operations with a minimum coverage of $1,000,000 per occurrence and $2,000,000 in the aggregate. Property damage coverage shall include coverage for explosion, collapse and underground hazards. Coverage for products/completed operations shall extend for a period of three (3) years after the date of substantial completion. Property damage in the amount of not less than $1,000,000 for any one accident. Additional limits may be required.

(3) Comprehensive Automobile Liability Insurance for bodily injury and property damage with a minimum coverage of $1,000,000 per occurrence and $1,000,000 in the aggregate.

(4) Excess or Umbrella insurance supplementing coverage under the Commercial General Liability, Comprehensive Automobile Liability Insurance and Employer's Liability Insurance policies with a minimum coverage of $1,000,000 per occurrence and $1,000,000 in the aggregate

The Contractor shall endorse the Authority on its insurance policy as an additional insured to protect the interests of the public. Certificates of Insurance and Additional Insured Endorsements acceptable to the Authority shall be filed with the Authority prior to commencement of the Work. These Certificates and Endorsements shall contain a provision that coverages afforded under the policies will not be cancelled until at least thirty days prior written notice has been given to the Authority. Insurance certificates must include an additional insured endorsement naming the following as an additional insured: "The Northern Virginia Regional Park Authority, its officers, directors, agents, employees, and volunteers." The endorsement must be completed on endorsement form CG 20 10 11 85 or CG 20 10 07 04 or such other form acceptable to the Authority.

(b) <u>The Authority's Liability Insurance</u>

The Authority shall be responsible for purchasing and maintaining its own liability insurance and, at its option, may purchase and maintain such insurance as will protect it against claims that may arise from operations under the Contract.

(c) <u>Property Insurance</u>

Unless otherwise provided, the Authority shall purchase and maintain property insurance upon the entire Work at the site to the full insurable value thereof. This insurance shall include the interests of the Authority, the Contractor, Subcontractors, and Sub-subcontractors in the Work and shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss or damage including, without duplication of coverage, theft, vandalism and malicious mischief. If the Authority does not intend to purchase such insurance for the full insurable value of the entire Work, it shall inform the Contractor in writing prior to commencement of the Work. The Contractor may then affect insurance that will protect the interests of itself, its Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Authority. If not covered under the all risk insurance or otherwise provided in the Contract Documents, the Contractor shall effect and maintain similar property insurance on portions of the

Work stored off the site or in transit when such portions of the Work are to be included in an Application for Payment.

(d) **The Authority shall purchase and maintain such boiler and machinery insurance as may be required by the Contract Documents or by law. This insurance shall include the interests of the Authority, the Contractor, Subcontractor and Sub-subcontractors in the Work**

(e) **Any loss insured under Article 34(c) is to be adjusted with the Authority and made payable to the Authority as trustee for the insured's, as their interests may appear. The Contractor shall pay each Subcontractor a just share of any insurance monies received by the Contractor, and by appropriate agreement, written where legally required for validity, shall require each Subcontractor to make payments to its Sub-subcontractors in similar manner.**

(f) **If the Contractor requests in writing that insurance for risks other than those described in Article 34(c) or (d) or other special hazards be included in the property insurance policy, the Authority may, if possible and in its sole discretion, include such insurance, and the cost thereof shall the charged to the Contractor by appropriate Change Order.**

(g) **The Authority and the Contractor waive all rights against (1) each other and the Subcontractors, Sub-subcontractors, agents and employees each of the other, and (2) the Engineer and separate contractors, if any, and their subcontractors, sub-contractors, agents and employees, for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to Article 34(c) or (d) or any other property insurance applicable to the Work, except such rights as they may have to the proceeds of such insurance held by the Engineer as trustee. The foregoing waiver afforded the Engineer, its agents and employees shall not extend to the liability imposed by Article 36(a). The Authority or the Contractor, as appropriate, shall require of the Engineer, separate contractors, Subcontractors and Sub-subcontractors by appropriate agreements, written where legally required for validity, similar waivers each in favor of all other parities enumerated in this Article 34(g).**

(h) **If required in writing by the Contractor, the Authority as trustee shall, upon the occurrence of an insured loss, deposit in a separate account any money so received, and shall distribute it in accordance with the interests of the parties. If after such loss no other special agreement is made, replacement of damaged work shall be covered by an appropriate Change Order.**

(i) **The Authority as trustee shall have power to adjust and settle any loss with the insurers.**

(j) **If the Authority finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion thereof, such occupancy or use shall not commence prior to a time mutually agreed to by the Authority and the Contractor and to which the insurance company or companies providing the property insurance have consented by endorsement to the policy or policies. This insurance shall not be cancelled or lapsed on account of such partial occupancy or use. Consent of the Contractor and of the insurance company or companies to such occupancy or use shall not be unreasonably withheld.**

Article 35: ASSIGNMENTS

Neither the Contractor nor the Authority shall sell, transfer, assign, or otherwise dispose of the Contract or any portion thereof, or of its rights, title, or interest therein, or its obligations thereunder, without written consent of both parties.

Article 36: INDEMNIFICATION

(a) To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Authority, the Engineer and their agents, officers, directors and employees from and against all claims, damages, losses and expense, including but not limited to attorney's fees, arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom and (2) is caused in whole or in part by any negligent act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity that would otherwise exist as to any party or person described in this Article.

(b) In any and all claims against the Authority or the Engineer or any of their agents or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone whose acts any of them may be liable, the indemnification obligation under this Article shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit act.

(c) The Authority shall retain such monies due or to become due the Contractor under the Contract as considered necessary by the Authority until such suits, claims for damages costs or losses have been settled or otherwise disposed of or satisfactory evidence to that effect has been furnished to the Authority.

Article 37: CONTRACTOR LIABILITY

The Contractor shall be liable to Authority for all costs the Authority incurs as a result of the Contractor's failure to perform this Contract in accordance with its terms. The Contractor's failure to perform shall include the failure of its suppliers and or Subcontractors of any tier to perform. Contractor's liability shall include, but not be limited to, (1) damages, liquidated damages, and other delay costs payable to the Authority; (2) the Authority's increased costs of performance, such as extended overhead and increased performance costs resulting from Contractor-caused delays, improper Contractor work, or termination of the Contractor; (3) warranty and rework costs; (4) liability to third parties; (5) excess costs; and (6) attorney's fees and related costs.

Article 38: SEPARATE CONTRACTS

(a) The Authority reserves the right to let other contracts in connection with this Project. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate its work with theirs. If the proper execution or results of any part of the Contractor's work depends upon the work of any other contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results. The commencement of work by the Contractor shall indicate an acceptance of the previous contractor's work.

(b) The Authority may perform additional work related to the Project by itself, or it may let other contracts containing provisions similar to these. The Contractor shall afford the other contractors who are parties to such contracts, the Authority, if it is performing the additional work itself, reasonable opportunity for the introduction and storage of materials and equipment and the execution of work and shall properly connect and coordinate it Work with theirs.

(c) **If the performance of additional work by other contractors or the Authority is not specified in the Contract Documents prior to the execution of the Contract, Written Notice thereof shall be given to the Contractor prior to starting any such additional work. If the Contractor believes that the performance of such additional work by the Authority or others will result in additional expense to the Contractor or entitle it to an extension of the Contract Time, it may make a claim therefore as provided in Articles 25, 26 and 27.**

Article 39: SUBCONTRACTING

(a) **The Contractor may utilize the services of Subcontractors – which will have been approved by the Authority prior to commencement of the work – on those parts of the Work that, under normal contracting practices are performed by Subcontractors. The Contractor shall submit a list of proposed Subcontractors prior to commencement of the Work for the Authority's review and approval. The Contractor shall not employ a Subcontractor to which the Authority may object. The Authority shall not withhold its approval unreasonably.**

(b) **The Contractor shall not award work to a single Subcontractors in excess of 50 percent of the Contract Price without prior written approval of the Authority.**

(c) **The Contractor shall be fully responsible to the Authority for the acts and omissions of its Subcontractors and of persons either directly or indirectly employed by them, as it is for the acts and omissions of person directly employed by it. The Contractor shall be fully responsible for the coordination of the work of the trades, Subcontractors and suppliers, and their officers, agents and employees.**

(d) **By an appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities that the Contractor, by the Contract Documents, assumes toward the Authority and the Engineer. The agreement shall preserve and protect the rights of the Authority and the Engineer under the Contract Documents with respect to the Work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights, and shall allow the Subcontractor, unless specifically provided otherwise in the Contractor-Subcontractor agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by these Documents, has against the Authority. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with its Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the Subcontract, copies of the Contract Documents to which the Subcontractor will be bound by this Paragraph and identify to the Subcontractor any terms and conditions of the proposed Subcontract that may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Documents available to its Sub-subcontractors.**

(e) **Nothing contained in the Contract Documents shall create any contractual arrangement between any Subcontractor and the Authority.**

(f) **Within seven (7) days after receipt of amounts paid to it, contractor shall either:**

(1) **Pay its subcontractors for the proportionate share of the total payment received attributable to the work performed by the subcontractor under the contract; or**

(2) **Notify the Authority and subcontractor in writing of his intentions to withhold all or part of the subcontractor's payment with the reasons for the nonpayment.**

(g) **Contractor shall include in each of its subcontracts a provision requiring each subcontractor to include or otherwise be subject to the same payment and interest requirements with respect to each lower-tier subcontractor that the contractor is subject to in subparagraph (f) and Article 32(e).**

Article 40: ENGINEER

(a) **The Engineer will act as the Authority's representative during the construction period and until final payment.**

(b) **The Engineer will visit the site at intervals appropriate to the stage of construction to familiarize itself and determine in general if the work is proceeding in accordance with the Contract Documents. However, the Engineer will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of its on-site observations, it will keep the Authority informed of the progress of the Work, and will endeavor to guard the Authority against defects and deficiencies in the Work of the Contractor.**

(c) **The Engineer will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and it will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Engineer will not be responsible for or have control or charge over the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any of the Work. This Article shall in no way change the Engineer's responsibilities or liability to Authority.**

(d) **The Engineer will render interpretations necessary for the proper execution or progress of the Work, with reasonable promptness and in accordance with any time limit agreed upon. Either party to the Contract may make a written request to the Engineer for such interpretations.**

(e) **Claims, disputes, and other matters in question between the Contractor and the Authority relating to the execution or progress of the Work or the interpretation of the Contract Documents shall be referred initially to the Engineer for decision, which it will render in writing within a reasonable time. Unless the Contractor provides written notice to the Authority and the Engineer of any objection to the Engineer's decision, the Engineer's decision shall be final and binding.**

(f) **All interpretations and decisions of the Engineer shall be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. The Engineer will endeavor to secure faithful performance by both the Authority and The Contractor, will not show partiality to either, and will not be liable for the result of any interpretation or decision rendered in good faith in such capacity.**

(g) **The Engineer's decisions in matters relating to artistic effect will be final if consistent with the intent of the Contract Documents and agreed to by the Authority.**

(h) **The parties agree to perform the Work, accept the interpretation or otherwise follow the decision of the Engineer so as to not delay the progress of the Work. Notwithstanding this provision, the Authority may stop the Work pending a judicial review of the Engineer's decision.**

(i) **The Engineer will have authority to reject Work, which does not conform to the Contract Documents.**

(j) **The Engineer will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for conformance with the design concept of the Work and with the information given in the Contract Documents. Such action shall be taken with reasonable promptness so as to cause no delay. The Engineer's approval of a specific item shall not indicate approval of an assembly of which the item is a component.**

(k) **The Engineer will conduct inspections to determine the dates of Substantial Completion and final completion, will receive and forward to the Authority for the Authority's review written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment upon compliance with the requirements of Article 34.**

(l) **Notwithstanding any other provision to the contrary, Article 40(e) to (h) shall <u>not</u> apply to this project if there IS no Project Engineer.**

Article 41: WARRANTY

(a) **The Contractor warrants to the Authority and the Engineer that all materials and equipment furnished under this Contract will be new unless otherwise specified and that all Work will be performed in a good and workmanlike manner and will be of good quality, free from faults and defects and in conformance with the Contract Documents and the Legal Requirements. All Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Engineer, the Contractor shall furnish satisfactory evidence of the kind and quality of materials and equipment.**

(b) **The Contractor shall promptly correct all Work rejected by the Engineer as defective or as failing to conform to the Contract Documents whether observed before or after substantial Completion and whether or not fabricated, installed, or completed. The Contractor shall bar all costs of correcting such rejected Work, including compensation for the Engineer's additional services made necessary thereby.**

(c) **If, within one year after the Date of Substantial Completion of the Work or designated portion thereof or within one year after acceptance by the Authority of designated equipment or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the Authority to do so unless the Authority has previously given the Contractor a written acceptance of such condition. This obligation shall survive termination of the Contract. The Authority shall give such notice promptly after discovery of the condition.**

Article 42: CONTRACTUAL DISPUTES

Contractual claims, whether for money or for other relief, shall be submitted in writing not later than (60) sixty days after final payment; however, written notice of the Contractor's intention to file such claim must be given at the time of the occurrence or beginning of the work upon which the claim is based. A written decision upon any such claims will be made by the Authority within thirty (30) days after submittal. The Contractor may not institute legal action prior to receipt of the Authority's decision on the claim unless it fails to render such decision within 120 days. The decision of the Capital Programs Director or other signatory on the Contract shall be final and conclusive unless the Contractor within six (6) months of the date of the final decision on a claim, initiates legal action as provided in § 2.2-4364 of the Code of Virginia. Failure of the Authority to render a decision within 120 days shall not result in the Contractor being awarded the relief claimed nor shall it result in any other relief or penalty. The sole result of the Authority's failure to render a decision within the time allotted shall be the Contractor's right to immediately institute legal action. No administrative appeals procedure pursuant to § 2.2-4365 of the Code of Virginia has established for contractual claims under this Contract.

Revised 1/10/18

CONSTRUCTION CONTRACT

This Construction Contract is made this _____ day of _____, 2018 by and between NOVA Parks, 5400 Ox Road, Fairfax Station, Virginia 22039 ("Authority"), and _____ (Contractor) for the project known as_____.

Article 1.

1.1 The Contract Documents consist of this Construction Contract, the Conditions of the Contract (General Supplementary, Special, and other Conditions), the Drawings, the Specifications, all standard details that apply to any portion of the Work, and all addenda issued prior to and Change Orders issued after execution of this Construction Contract. The Contract Documents are more specifically listed in Exhibit A. Minimum contractor's liability insurance amounts are listed in Exhibit B.

Article 2. The Work

2.1 The Contractor shall furnish all labor, materials, and equipment necessary to perform _____as shown, indicated or reasonably implied by the Contract Documents. The Work shall be done in strict accordance with the Contract Documents and all applicable federal, state, and local governmental specifications and requirements.

Article 3. Time of Commencement and Completion

3.1 The Contract Time will begin to run on the date indicated in the Authority's written Notice to Proceed. The Contractor shall start the Work within five (5) days of the date of the Notice to Proceed. The Contractor shall prosecute the work in such a manner as to achieve Substantial Completion of the base portion of the work within the time limits indicated in the Supplemental General Conditions.

3.2 If the Work is not Substantially Completed within the time required, as that time may be adjusted by Change Orders, there shall be imposed on the Contractor Liquidated Damages of $1,000.00 per calendar day for each day beyond the Contract Time it takes to substantially complete the Work. Contractor is specifically referred to the General Conditions regarding its duties to notify the Authority in writing of any delays caused to it during the Work. The Liquidated Damages amount shall, in no event, be considered a penalty or other than the liquidated and adjusted damages to the Authority because of the delay. The Contractor and its surety agree that the stated sum per day shall be deducted and retained out of the monies which may become due hereunder and if not so deducted, the Contractor and its surety shall be liable therefore.

Article 4. Contract Sum

4.1 Authority agrees to pay Contractor _____ (Dollars) ($_____) for the Work including the Base Bid and Alternates _____, subject to additions and deductions by Change Order.

4.2 The Authority shall make monthly progress payments on account of the Contract Sum to the Contractor as provided in the Contract Documents for the period ending the last day of each month. Not later than fifteen (15) days after the end of the period covered by the Application for Payment, Contractor will submit to the Architect a Request for Payment based on the payment schedule of values agreed to by the Architect. The Contractor's submission of its Application for Payment, the Authority's and Architect's review, and the Authority's payment of progress and final payments shall all be in accordance with the General Conditions.

Article 5. Miscellaneous Provisions

5.1 This Contract shall be construed and enforced in accordance with the laws of the Commonwealth of Virginia.

5.2 During the performance of this Contract, the Contractor agrees as follows:

A. The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin, except where religion, sex, or national origin is a bona fide occupation qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

B. The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such Contractor is an equal opportunity employer.

C. Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

The Contractor will include the provisions of subparagraphs A, B, and C above, in every subcontract or purchase order of over $10,000 so that the provisions will be binding upon each subcontractor or vendor.

5.3 These terms and provisions supersede all previous communications, representations, or agreements, either oral or written, between the parties with respect to the subject matter of this Contract. This Agreement is entered into as of the day and year first written above.

NOVA Parks	**CONTRACTOR**
	Company: _____
By: _____	By: _____
Title: _____	Title: _____
Date: _____	Date: _____

Exhibit A - Contract Documents

- Project Manual dated _____
-

Exhibit B - Contractor's Liability Insurance

- General liability in the amount of not less than $1,000,000 per occurrence and $2,000,000 aggregate.
- Property damage in the amount of not less than $1,000,000 for any one accident. Additional limits may be required.
- Umbrella policy for not less than $1,000,000.
- Auto liability insurance for not less than $1,000,000 combined single limits.
- Workers' Compensation per statutory limits and employer's liability in the following minimum amounts: EL Each Accident - $500,000, EL Disease Policy Limit - $500,000, EL Disease Each Employee $500,000.
- Contractor shall endorse the Authority on its insurance policy as an additional insured using form CG 20 10 11 85 or CG 20 10 07 04.