The listings below consists all Clarifications, Changes to the Construction Drawings, and/or Changes to the Project Manual itemized contained within the noted subject above. Please see the following pages for the Pre-Bid Sign-In Sheet.

**CLARIFICATIONS:**

1. None

**CHANGES TO THE CONSTRUCTION DRAWINGS:**

1. L0.00 – ADJUSTED SHEET LIST TO REMOVE L6.01 FROM THE DOCUMENTS
2. L2.00 – REVISED DETAIL 07 & 10 TO INCLUDE ADDITIONAL MANUFACTURERS FOR EXTERIOR LIGHTS.
3. L2.00 – UPDATED COLOR & SIZES OF ADA TACTILE WARNING PAVERS
4. L6.01 – REMOVED FROM THE PLAN-SET
5. C3.0 – UPDATED TO SHOW TEST HOLE LOCATIONS
6. C4.0 – UPDATED EXTENTS OF TREE PROTECTION FENCING
7. C4.1 – ADDED TREES ALONG THE SOUTHERN PLAZA TO DEMOLITION SCOPE. ADDED NOTATIONS REGARDING EXISTING WATER LINES TO BE ABANDONED AND RELOCATED BY OTHERS.
8. C6.0 – ADDED NOTATION REGARDING WORK HOURS & WATER LINE RELOCATION SCOPE.
9. C7.0 – REMOVED FIRE HYDRANT DETAIL FROM SCOPE OF WORK. ADDED NOTATIONS REGARDING BRICK PAVING PATTERNS AT FLUSH CURB CONDITIONS.
10. C7.1 – ADDED TEST HOLE FIELD REPORTS
11. E001 – ADDED NOTES REGARDING PROPERTY LINES

**CHANGES TO THE PROJECT MANUAL:**

1. TABLE OF CONTENTS – ADDED MISSING 016000 TO SPECIFICATION LIST. REVISED SPECIFICATION NUMBER FOR CLOSEOUT PROCEDURES.
2. 015639 – REMOVED WOOD PROTECTION ZONE FENCING FROM APPROVED TYPES OF FENCING.
3. 034500 – REVISED RELATED SECTION OF CAST IN PLACE CONCRETE
4. 265613 – REMOVED REFERENCES TO APPROVED POLE TYPES & REFERENCED ARCHITECTURAL DRAWINGS.
5. 265619 – REMOVED LUMINAIRE REQUIREMENTS & TYPES FROM SPECIFICATIONS AND REFERENCED ARCHITECTURAL DRAWINGS.

6. 321313 – REMOVED WHITE CURING MATERIALS FROM ACCEPTED MATERIALS.

7. 321723 – REMOVED PAINTED MARKINGS FROM APPROVED MATERIALS. ADDED THERMOPLASTIC MARKINGS INTO SPECIFICATION.

8. 328400 – REMOVED REFERENCES OF APPROVED PARTS & REFERENCED DRAWINGS.
<table>
<thead>
<tr>
<th>NAME</th>
<th>COMPANY</th>
<th>PHONE / FAX</th>
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<tbody>
<tr>
<td>James Simons Jr.</td>
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<tr>
<td>Tommy Cullather</td>
<td>Canterbury</td>
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<td><a href="mailto:cullatherc@csvc.net">cullatherc@csvc.net</a></td>
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</table>
1. It is the responsibility of the General Contractor to review the site conditions and inform the landscape Architect of any discrepancies in site conditions or original drawings that may affect the design of the landscape.

2. It should be noted that any discrepancies regarding landscape architectural, civil, or electrical engineering drawings, the Contractor is to contact landscape Architect to review and coordinate before proceeding with work.

3. Contractor shall contact the landscape Architect to review plans before commencing work in order to assure close coordination.

4. Existing utility locations shown are approximate.

5. Contractor shall verify location & depth of utilities prior to start of construction activities & shall notify the Landscape Architect.

6. Tree planting shall occur between years and proposed utilities. Contractor shall coordinate all necessary utility locations with the service provider in consultation with the landscape Architect.

7. Plant stakes shall be removed by the landscape Architect prior to trimming for location review and approval.

8. Contractor shall be responsible for any and all damages to the property to result from beginning construction activities in the vicinity of the property or replacement.

9. Prior to project completion, the area is to be sodedge or covered with all construction debris, etc., and removed by the landscape Architect and/or landscape consultant.

10. It is the Contractor's responsibility to keep the area neat and tidy to prevent it from becoming an eyesore for surrounding property owners. Dirt, mud, or other debris resulting from other items must be covered or weighted down to prevent wind from blowing such materials off of the construction site.

11. All accessible ramps shall be sloped at a maximum of 8.3% to meet ADA requirements.

12. All denuded areas which will be left dormant for more than 30 days shall be seeded with fast germinating cover crop vegetation immediately following grading of those areas. Selection of the seed mixture shall depend on the time of year it is applied. Landscape Engineer is to make determination.

13. Contractor shall contact the Service Provider in consultation with the landscape Architect.

14. Contractor shall be responsible for any and all damage to site features to result from construction activities in the vicinity of the property or replacement.

15. Contractor shall be responsible for any and all damage to the property to result from beginning construction activities in the vicinity of the property or replacement.

16. Contractor shall be responsible for the inspection of all construction debris, signs, etc., and removed by the landscape Architect and/or landscape consultant.

17. All denuded areas which will be left dormant for more than 30 days shall be seeded with fast germinating cover crop vegetation immediately following grading of those areas. Selection of the seed mixture shall depend on the time of year it is applied. Landscape Engineer is to make determination.

18. Contractor shall be responsible for any and all damage to site features to result from construction activities in the vicinity of the property or replacement.

19. Prior to project completion, the area is to be sodedge or covered with all construction debris, etc., and removed by the landscape Architect and/or landscape consultant.

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# TABLE OF CONTENTS

## BIDDING INFORMATION

| Notice of Invitation for Bids | -- |
| Instruction to Bidders | HECO-7A |
| Prebid Question Form | -- |
| Standard Bid Form | -- |

## GENERAL CONDITIONS & FORMS

| General Conditions of Construction Contract | HECO-7 |
| Construction Contract | HECO-9 |
| Workers Compensation Certificate of Insurance | HECO-9A |
| Standard Performance Bond | HECO-10 |
| Standard Labor and Material Payment Bond | HECO-10.1 |
| Standard Bid Bond Form | HECO-10.2 |
| Change Order Estimate (General Contractor) | HECO GC-1 |
| Change Order Estimate (Subcontractor) | HECO SC-1 |
| Change Order Estimate (Sub-subcontractor) | HECO SS-1 |
| Schedule of Values and Certificate for Payment | HECO-12 |
| Affidavit of Payment of Claims | HECO-13 |
| Architect/Engineer’s Certificate of Completion | HECO-13.1 |
| Architect/Engineer’s Certificate of Substantial Completion | HECO-13.1A |
| Contractor’s Certificate of Completion | HECO-13.2 |
| Contractor’s Certificate of Substantial Completion | HECO-13.2A |
| SWaM Reporting Requirements and Goals | -- |
| Contractor ID Badge Requirements | -- |
| Vendor eVA Registration Requirements | -- |
| Contractor Report Requirements | -- |

## SPECIFICATIONS

### DIVISION 01 – GENERAL REQUIREMENTS

| 011000 | Summary |
| 012900 | Payment Procedures |
| 013100 | Project Management and Coordination |
| 013300 | Submittal Procedures |
| 014000 | Quality Requirements |
| 015000 | Temporary Facilities and Controls |
| **016000** | **Product Requirements** |
| 015639 | Temporary Tree and Plant Protection |
| 017300 | Execution |
| 0174700 | Closeout Procedures |

### DIVISION 02 – EXISTING CONDITIONS

Not Used

### DIVISION 03 – CONCRETE
## TABLE OF CONTENTS

### 034500 Precast Architectural Concrete

<table>
<thead>
<tr>
<th>Division</th>
<th>Description</th>
<th>Not Used</th>
</tr>
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<tbody>
<tr>
<td><strong>DIVISION 04 – MASONRY</strong></td>
<td>Not Used</td>
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<tr>
<td><strong>DIVISION 05 – METALS</strong></td>
<td>Not Used</td>
<td></td>
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<tr>
<td><strong>DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES</strong></td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td><strong>DIVISION 07 – THERMAL AND MOISTURE PROTECTION</strong></td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td><strong>DIVISION 09 – FINISHES</strong></td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td><strong>DIVISION 10 – SPECIALTIES</strong></td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td><strong>DIVISION 11 – EQUIPMENT</strong></td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td><strong>DIVISION 12 – FURNISHINGS</strong></td>
<td>Not Used</td>
<td></td>
</tr>
<tr>
<td>129300 Site Furnishings</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DIVISION 22 – PLUMBING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>221113 Facility Water Distribution Piping</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DIVISION 26 – ELECTRICAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>260519 Low-Voltage Electrical Power Conductors and Cables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>260526 Ground and Bonding for Electrical Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>260533 Raceways and Boxes for Electrical Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>260543 Underground Ducts and Raceways for Electrical Systems</td>
<td></td>
<td></td>
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<tr>
<td>260553 Identification for Electrical Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>265613 Lighting Poles and Standards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>265619 LED Exterior Lighting</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DIVISION 31 – EARTHWORK</strong></td>
<td></td>
<td></td>
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<tr>
<td>311000 Site Clearing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>312000 Earth Moving</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DIVISION 32 – EXTERIOR IMPROVEMENTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>321216 Asphalt Paving</td>
<td></td>
<td></td>
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<tr>
<td>321313 Concrete Paving</td>
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<td>Description</td>
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<tr>
<td>321416</td>
<td>Brick Unit Pavers</td>
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</tr>
<tr>
<td>321723</td>
<td>Pavement Markings</td>
<td></td>
</tr>
<tr>
<td>328400</td>
<td>Planting Irrigation</td>
<td></td>
</tr>
<tr>
<td>329100</td>
<td>Soil Preparation</td>
<td></td>
</tr>
<tr>
<td>329223</td>
<td>Sodding</td>
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</tr>
<tr>
<td>329300</td>
<td>Plants</td>
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</tbody>
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**DIVISION 33 – UTILITIES**

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<tr>
<th>Item</th>
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<tr>
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C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil: Natural or cultivated top layer of the soil profile or manufactured topsoil; containing organic matter and 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 1 inch in diameter; and free of weeds, roots, and toxic and other nonsoil materials.

B. Protection-Zone Fencing: Fencing fixed in position and meeting one of the following requirements.

1. Chain-Link Protection-Zone Fencing: Galvanized-steel fencing fabricated from minimum 2-inch opening, 0.148-inch diameter wire chain-link fabric; with pipe posts, minimum 2-3/8-inch OD line posts, and 2-7/8-inch- OD corner and pull posts; with 1-5/8-inch OD top rails and 0.177-inch diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.

2. Wood Protection-Zone Fencing: Constructed of two 2-by-4-inch horizontal rails, with 4-by-4-inch preservative-treated wood posts spaced not more than 8 feet apart, and lower rail set halfway between top rail and ground.

3. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and supported by tubular or T-shape galvanized-steel posts spaced not more than 8 feet apart. High-visibility orange color, nonfading.

4. Height of Fencing: 4 feet.

5. Gates: Swing access gates matching material and appearance of fencing, to allow for maintenance activities within protection zones.

C. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
SECTION 034500 - PRECAST ARCHITECTURAL CONCRETE

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:
   1. Architectural precast concrete cladding units.
B. Related Sections include the following:
   1. Section 033000 321313 "Cast-In-Place Concrete" for installing connection anchors in concrete.

1.3 DEFINITION
A. Design Reference Sample: Sample of approved architectural precast concrete color, finish and texture, preapproved by Architect.

1.4 ACTION SUBMITTALS
A. Product Data: For each type of product indicated.
B. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption tests.
C. Shop Drawings: Detail fabrication and installation of architectural precast concrete units. Indicate locations, plans, elevations, dimensions, shapes, and cross sections of each unit. Indicate joints, reveals, and extent and location of each surface finish. Indicate details at building corners.
   1. Indicate separate face and backup mixture locations and thicknesses.
   2. Indicate welded connections by AWS standard symbols. Detail loose and cast-in hardware and connections.
   3. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
   4. Indicate locations, extent, and treatment of dry joints if two-stage casting is proposed.
C. Dead Load: Weight of luminaire and its horizontal and vertical supports, lowering devices, and supporting structure, applied according to AASHTO LTS-6-M.

D. Live Load: Single load of 500 lbf distributed according to AASHTO LTS-6-M.

E. Ice Load: Load of 3 lbf/sq. ft., applied according to AASHTO LTS-6-M for applicable areas on the Ice Load Map.

F. Wind Load: Pressure of wind on pole and luminaire, calculated and applied according to AASHTO LTS-6-M.

1. Basic wind speed for calculating wind load for poles 50 feet high or less is 90 mph.
   a. Wind Importance Factor: 1.0.
   c. Velocity Conversion Factor: 1.0.

G. Strength Analysis: For each pole, multiply the actual EPA of luminaires and brackets by a factor of 1.1 to obtain the EPA to be used in pole selection strength analysis.

H. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts unless otherwise indicated.

2.2 STEEL POLES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Architectural Drawings. See Architectural Drawings. to match campus standard or comparable product by one of the following:

1. Cooper Lighting, an Eaton business.
2. Lithonia Lighting; Acuity Brands Lighting, Inc.

B. Source Limitations: Obtain poles from single manufacturer or producer. See Architectural Drawings.

C. Source Limitations: For poles, obtain each color, grade, finish, type, and variety of pole from single source with resources to provide products of consistent quality in appearance and physical properties.

D. Poles: Comply with ASTM A 500/A 500M, Grade B carbon steel with a minimum yield of 46,000 psig; one-piece construction up to 40 feet in height with access handhole in pole wall. See Architectural Drawings.

1. Shape: Round, tapered.
2. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.

E. Pole-Top Tenons: Fabricated to support luminaire or luminaires and brackets indicated, and securely fastened to pole top. See Architectural Drawings.

F. Fasteners: Stainless steel, size and type as determined by manufacturer. Corrosion-resistant items compatible with support components. See Architectural Drawings.
PART 2 - PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.

C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

D. UL Compliance: Comply with UL 1598 and listed for wet location.

E. Lamp base complying with ANSI C81.61.

F. CRI of minimum 70. CCT of 2700 K. See Architectural Drawings.

G. L70 lamp life of 50,000 hours.

H. Nominal Operating Voltage: 120-277V ac, universal.

I. In-line Fusing: On the primary for each luminaire.

J. Lamp Rating: Lamp marked for outdoor use. See Architectural Drawings.

K. Source Limitations: Obtain luminaires from single source from a single manufacturer. See Architectural Drawings.

L. Source Limitations: For luminaires, obtain each color, grade, finish, type, and variety of luminaire from single source with resources to provide products of consistent quality in appearance and physical properties.

2.2 LUMINAIRE TYPES

A. Area and Site:

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Architectural Drawings. See Architectural Drawings. or comparable product by one of the following:

   a. Cooper Lighting, an Eaton business.
   b. Juno Lighting Group by Schneider Electric.
   c. KIM Lighting.
   d. Lightolier, a Philips group brand.
   e. Lithonia Lighting; Acuity Brands Lighting, Inc.

2. Luminaire Shape: Round. See Architectural Drawings.


4. Luminaire-Mounting Height: As specified on Architectural Drawing.

5. Distribution: As specified on Architectural Drawing.
   a. Extruded aluminum housing and heat sink.
   b. Powder-coat finish.

2.3 MATERIALS

A. Metal Parts: Free of burrs and sharp corners and edges.

B. Sheet Metal Components: Corrosion-resistant aluminum. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.

D. Diffusers and Globes:
   1. Acrylic Diffusers: 100 percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
   2. Glass: Annealed crystal glass unless otherwise indicated.
   3. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

E. Lens and Refractor Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

F. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:
   1. White Surfaces: 85 percent.
   2. Specular Surfaces: 83 percent.
   3. Diffusing Specular Surfaces: 75 percent.

G. Housings:
   1. Rigidly formed, weather- and light-tight enclosure that will not warp, sag, or deform in use.
   2. Provide filter/breather for enclosed luminaires.

H. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
   1. Label shall include the following lamp characteristics:
      a. “USE ONLY” and include specific lamp type.
      b. Lamp diameter, shape, size, wattage and coating.
      c. CCT and CRI for all luminaires.
D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B, dissipating.

F. White, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 2, Class B, dissipating.

2.5 RELATED MATERIALS

A. Joint Fillers: ASTM D1751, asphalt-saturated cellulosic fiber in preformed strips.

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.

2.6 CONCRETE MIXTURES

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

B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.

1. Fly Ash or Pozzolan: 25 percent.
2. Slag Cement: 50 percent.
3. Combined Fly Ash or Pozzolan, and Slag Cement: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

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 1-1/2 percent.

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

E. Concrete Mixtures: Normal-weight concrete.

2. Maximum W/C Ratio at Point of Placement: 0.45.
3. Slump Limit: 4 inches, plus or minus 1 inch.
SECTION 321723 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY
   A. Section includes painted markings applied to asphalt and concrete pavement.

1.2 PREINSTALLATION MEETINGS
   A. Preinstallation Conference: Conduct conference at Project site- VCU Intersection of Linden and Main Streets.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product.
   B. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Meeting VDOT Road and Bridge 2007 Specifications and as listed on VDOT Approved Materials list.

2.2 PAVEMENT-MARKING PAINT
   A. Pavement-Marking Paint: MPI #32, alkyd traffic-marking paint.
      1. Color: As indicated
   B. Pavement-Marking Paint: MPI #97, latex traffic-marking paint.
      1. Color: As indicated.
   C. Glass Beads: AASHTO M 247, Type 1

2.3 PAVEMENT-MARKING THERMOPLASTIC
   A. Pavement-Marking Thermoplastic: Type B, Class I
1. Thermoplastic material shall be suitable for use on asphalt and hydraulic cement concrete pavement surfaces and shall be selected from the Virginia Department of Transportation Materials Division’s Approved Products List No. 43.

2. Color: White

B. Pavement-Marking Preformed Thermoplastic: Type B, Class II

1. Thermoplastic material shall be suitable for use on asphalt and hydraulic cement concrete pavement surfaces and shall be selected from the Virginia Department of Transportation Materials Division’s Approved Products List No. 73.

2. Color: White

PART 3 - EXECUTION

3.1 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow paving to age for a minimum of 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer’s recommended rates to provide a minimum wet film thickness of 15 mils (0.4 mm).

   1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils. Apply paint so that it cannot run beneath the stencil.

   2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal. (0.72 kg/L).

END OF SECTION 321723
4. Directional boring is the responsibility of the installing contractor. Estimated location of bore is outlined on the irrigation plan. Contractor to field adjust location of permanent bore once public and private utilities are identified within the construction boundaries and approved by VCU Representative.

5. Remove pavers along sidewalk, excavate and locate RPZ and Controller as outlined on the Drawing. Coordinate this portion of the project with The VCU to minimize sidewalk closures during construction.

PART 2 - PRODUCTS

2.1 MATERIALS

1. General:
   1. Provide only new materials, without flaws or defects and of the highest quality of their specified class and kind to be provided by an authorized Product Distributor. Product distributors will be asked to submit their factory authorization to sell and service all components that they provide.

   2. Comply with pipe sizes indicated. No substitution of smaller pipes will be permitted. Larger sizes may be used subject to acceptance of the VCU designated representative. Remove damaged and defective pipe.

   3. Provide pipe continuously and permanently marked with manufacturer’s name or trademark, size schedule and type of pipe, working pressure at 73 degrees F. and National Sanitation Foundation (NSF) approval.

2. Plastic pipe, fittings, and connections:
   1. 3.0” diameter and under: SDR 21 PR200, bell end PVC.
   2. PVC pipe fittings: ASTM D2241 schedule 40 PVC molded fittings suitable for solvent weld connections. Fittings made of other materials are not permitted. Saddle and cross fittings not permitted.

Master Valve
1. See drawings. Shall be Toro Part # P220-26-04 1” Electric Valve installed in Part # 174501 Highline Standard Valve Box.
2. Install Ball Valve in front of MV Part # 2132-010

Flow Sensor
1. See drawings. Shall be Toro Part # WT-FS-100 installed per manufacturer’s specification. Install flow sensor in Part # 184501 Highline 10” Round Valve box.

Wire
1. Shielded Cable for Flow Sensor 16/2 Paige Part # P-7162-D.
2. Field wiring to be 14/2 gauge single strand twisted pair Part # 170800R
3. Install separate Green Tracer wire Part # 14-G-2500
Field Controller

1. Controller provided by owner. Controller to be installed by Contractor per Manufacture Specifications
2. Controller to be installed is WeatherTrak Part # WTPRO3C-2W48. See drawings.

Field Decoders

1. Install single station decoders at each valve Part # WT2W-SVD-11
2. Install Line Surge protection per plan Part # WT2W-LSP

Drip Irrigation

1. All Drip tubing used is to be Netafim .4 gph - 18” spacing
2. Use Netafim low volume drip kit Part # LVCZNV10075 HF

Sprinkler Heads

1. See drawings. Spray Heads to be 6” Toro 570Z - Part #’s 570Z-6LP
2. Spray Nozzles - Toro Precision Part # O-T-12-H adjust radius and spray patterns according to need.

Backflow Prevention

1. Connect to existing Backflow Valves

2. See drawings. Valves to be installed Toro P220-26-04 1” Electric Valve installed in Part #174501 Highline Standard Valve Box
2. Install 1” Ball Valve in front of each zone valve Part # 2132-010

2.3 ACCESSORIES

1. Drainage fill: 2” washed pea gravel.
2. Fill: Clean soil free of stones larger than 1” diameter foreign matter, organic material and debris

1. Provide imported fill material as required to complete the work. Obtain rights and pay all costs for imported materials.
2. Suitable excavated materials removed to accommodate the irrigation system work may be used as fill material subject to the VCU designated representative’s review and acceptance.