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**PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes:
1. Metal Grating and Tree Grates and Frames
  2. Pylons, See Lighting Pylons, 12 93 10
  3. Bench Frames
  4. Metal Planter
  5. Paving Retention Angles.
  6. Threaded Rod, Nuts, and Washers for Anchorage.
  7. Adhesive to Anchor Threaded Rods into Concrete.
  8. Decorative Utility Vault Lift- Out Lid.
  9. Slot Drain.

**1.2 REFERENCES**

- A. ASTM — ASTM International:
1. A 123 — Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  2. A 193 — Specification for Alloy Steel and Stainless Steel Bolting Materials for High Temperature Service.
  3. A 194 — Specification for Carbon and Alloy Steel Nuts for Bolts for High-pressure and High- temperature Service.
  4. A 240 — Specification for Heat-resisting Chromium and Chromium-nickel Stainless Steel Plate Sheet and Strip for Pressure Vessels.
  5. A 276 — Specification for Stainless Steel Bars and Shapes.
  6. A 312 — Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
  7. A 380 — Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment and Systems.
  8. A 554 — Standard Specification for Welded Stainless Steel Mechanical Tubing.
  9. A 743 — Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion- Resistant, for General Application.
  10. A 967 — Standard Specification for Chemical Passivation Treatments for Stainless SteelParts.
  11. C 881 — Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
  12. C 1028 – Standard Test Method for determining the Static Coefficient of Friction of Ceramic Tile and Other like Surfaces by the horizontal Dynamometer Pull-Meter Method.
  13. C 1107 — Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
  14. F1677 – Standard Test for Using a Portable Inclined Articulated Struct Slip Test (PIAST).
  15. 1F1679 – Standard Test Method for Using a Variable Incidence Tribometer (VIT).
- B. AWS — American Welding Society, Inc.:
1. A2.4 — Standard Welding Symbols.
  2. D1.6 — Structure Welding Code (Stainless Steel).
- C. IBC — International Building Code, Current Edition.

**1.3 DEFINITIONS**

- A. Acceptance, Acceptable, or Accepted: Acceptance by the Owner's Representative in writing.

**1.4 SUBMITTALS**

- A. LEED Submittals:
1. Within 30 days of Contract award, assemble and submit all LEED material information on the "LEED Material Tracking Spreadsheets" and forms provided in the Project Manual, together with all supplemental documentation as required by LEED.
- B. Environmental Submittals:

1. Credit MR 4.1 and 4.2: Product data indicating percentage by weight of post-consumer and post-industrial recycled content for products having recycled content. Include a statement indicating projected costs for each product having recycled content.
  2. Credit MR 5.1 and 5.2: Product data indicating location of extraction and processing and location of manufacture. Include a statement indicating projected costs for each product being extracted, processed, and manufactured within 500 air miles of the Project Site.
- C. Product Data required:
1. Tree Grating, Trench Grating and Frames.
  2. Threaded Rod.
  3. Nuts.
  4. Bolts.
  5. Screws.
  6. Washers.
  7. Adhesive.
- D. Shop Drawings:
1. Submit Shop Drawings of manufactured units and fabricated items for acceptance prior to fabrication.
  2. Show shop and erection details including dimensions, sizes, thicknesses, gauges, finishes, joining, attachments, holes, welds, bolts, screws, elevations and relationship of work to
  3. adjoining construction, including finished soil grades and finished paving surfaces.
  4. Shop drawing to reflect custom configurations at termination of standard units as required, including concrete footing supports.
  5. Where welded connectors, concrete, or masonry inserts are required to receive Work, show exact locations required.
  6. Where items must fit and coordinate with finished surfaces and/or constructed spaces, take measurements at site and not from Drawings.
  7. Indicate welded connections using standard AWS A2.4 welding symbols.
  8. Furnish accepted Shop Drawings to the trades responsible for installing the connectors, inserts and footings.
- E. Samples:
1. Metal Grate Paving: Four full-size panels each of the circular tree opening area and the parallel orthogonal grate.
  2. Metal Planter: One planter section (2'-5 3/4") long panel with specified finish.
- F. Mock-ups:
1. Metal Grate: Provide one tree circular grate opening and end conditions at stone paving.
- 1.5 INFORMATIONAL SUBMITTALS**
- A. Test Reports: Coefficient of Friction Test Report for Metal Grating.
  - B. Certificates: Welder's Certificates documenting AWS qualification within the previous 12 months.
- 1.6 QUALITY ASSURANCE**
- A. Installer and Fabricator Qualifications: Workmanship shall be best standard practice of trades and shall be performed by mechanics skilled in type of Work required.
  - B. Regulatory Requirements: Meet requirements of applicable laws, codes, and regulations required by authorities having jurisdiction over Work.
- 1.7 DELIVERY, STORAGE AND HANDLING**
- A. Protective Pads: Use protective pads to ledge angles anchored to thickened subslab edge using wedge anchor inserts, to prevent damage to metal finish when lifting, handling and shipping.
  - B. Handling: Provide adequate support and attachments during handling to prevent structural damage.
- 1.8 SITE CONDITIONS**

- A. Field Measurements: Secure field measurements required for adequate fabrication and installation of the Work covered by this Section.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURED UNITS**

- A. Metal Tree Grates and Frames: Iron Age Designs, Neenah or approved equal.
- B. Lighting Pylons: Section 12 93 10 as show on Drawings
- C. Metal Slot Drain: ACO, Brick Slot or approved equal as shown on Drawings
- D. Stainless Steel Planter: As shown on Drawings.

### **2.2 MATERIALS**

- A. Performance/Design Criteria:
  - 1. Environmental Requirements:
    - a. Credit MR 4.1 and 4.2: Provide materials with minimum 30% post-consumer recycled content and post-industrial recycled content to the extent possible.
- B. Angles, Bars, and Shapes: ASTM A 276, Type 316 stainless steel.
- C. Angles, Bars, and Shapes: Type A36 carbon steel.
- D. Steel for Fabricated Frames: ASTM A 240, Type 316 stainless steel, size as noted on Drawings.
- E. Threaded Rods: ASTM A 240, Type 316, stainless steel, with 70,000-PSI minimum tensile strength.
- F. Threaded Studs: ASTM A 240, Type 316, stainless steel, with 70,000-PSI minimum tensile strength.
- G. Nuts for Stainless Steel Threaded Rod, Stainless Steel Bolts, and Stainless Steel Screws and Weld
- H. Plates: ASTM A 240 Type 316, stainless steel.
- I. Adhesive for Anchoring Threaded Rods in Concrete: ASTM C 881, 2 component, chemical- resistant, structural epoxy bonding system formulated for exterior use in anchoring threaded rods, bolts, reinforcing bars, and smooth dowels into solid material.
- J. Grout: ASTM C 1107, high-strength, non-shrink, waterproof.
- K. Flat Washers: Type 316 stainless steel.
- L. Bolts: ASTM A 240, Type 316, minimum tensile strength of 85,000 psi stainless steel.

### **2.3 TOLERANCES**

- A. Grating:
  - 1. Overall Length and Width of Each Grating Section: Plus or minus 1/8-inch maximum.
  - 2. Diagonal to Diagonal of Each Grating Section: Plus or minus 1/8-inch maximum.
  - 3. Centerline to Centerline of Bearing Bars: Plus or minus 1/16-inch maximum.
  - 4. Alignment of Bearing Bar Top Surfaces and Bearing Bar End Surfaces: Plus or minus 1/16- inch maximum.

### **2.4 SHOP FABRICATION**

- A. Accepted Shop Drawings: Do not fabricate or deliver metal fabrications to the site before Shop
- B. Drawings have been accepted.
- C. Field Measurements: Verify measurements in field prior to fabrication.

- D. Fabrication:
  - 1. Fabricate items per accepted Shop Drawings.
  - 2. Fabricate items accurately fitted free from distortion or defects.
  - 3. Miter corners and angles of frames unless indicated otherwise.
- E. Templates: Furnish templates for exact location of anchor bolts, and other items to be embedded in concrete, with setting instructions required for installation of embedded items.
- F. Shop Welding:
  - 1. Meet requirements of AWS D1.6.
  - 2. Grind visible welds of manufactured units and rails smooth and finish so that joints are not visually detectable and rails appear as single pieces.
- G. Pickling and Passivation of Stainless Steel: Pickle and chemically passivate manufactured and fabricated items after fabrication and drilling in accordance with ASTM A 380 and ASTM A 967.
- H. Finish: Provide a #7 directional brush finish for all exposed stainless steel as approved by Owner's Representative.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Verification of Conditions: Examine site and verify that conditions are suitable to receive Work and that no defects or errors are present which would cause defective installation of products or cause latent defects in workmanship and function.
- B. Notification: Before proceeding with Work, notify the Owner's Representative in writing of unsuitable conditions.

#### **3.2 PREPARATION**

- A. Protection:
  - 1. Use every possible precaution to prevent damage to existing conditions to remain such as structures, utilities, irrigation systems, plant materials and paving on or adjacent to the site of the Work.
  - 2. Use every possible precaution to prevent excessive compaction of planting area soil and soil mixes within or adjacent to the areas of Work.
  - 3. Provide barricades, fences or other barriers to protect existing conditions to remain from damage during construction.
  - 4. Do not store materials or equipment, permit burning, or operate or park equipment under the branches of existing plants to remain.
  - 5. Submit written notification of conditions damaged during construction to the Owner's Representative immediately.
- B. Embedded Items: Supply metal items required to be cast into concrete or embedded in masonry with setting templates to appropriate trades.

#### **3.3 INSTALLATION**

- A. Attachment:
  - 1. Coordinate site metal fabrications with adjoining work for details of attachment, fittings, etc.
  - 2. Do cutting, drilling, threading, tapping, etc., required for attachment of site metal fabrications to adjacent Work.
  - 3. Install anchors, bolts, washers, inserts, lag screws, and other miscellaneous steel or iron fastenings required for installation, completion of Work, as indicated on Drawings, details and schedules, at time scheduled for Work.
- B. Field Welding:
  - 1. Meet requirements of AWS D1.6.
  - 2. Welding will be permitted only where indicated or accepted on the Shop Drawings.

3. Grind visible welds smooth and finish so that joints are not visually detectable.
- C. Exposed Moldings and Frames: Miter corners and angles of exposed moldings and frames unless otherwise noted.
- D. Field Assembly:
  1. Install items plumb and level, accurately fitted, free from distortion or defects.
  2. Meet requirements of accepted Shop Drawings.
  3. Brace and carefully handle shop fabricated items subject to damage to prevent distortions or other damage.
  4. After assembly, align and adjust the various members forming parts of a completed frame or structure accurately before being fastened.
  5. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
  6. Obtain acceptance prior to site cutting or making adjustments not scheduled.
- E. Fastening:
  1. Provide miscellaneous fastenings necessary for the complete assembly and installation.
  2. Install fasteners as specified.

### 3.4 THREADED RODS

- A. Threaded Rods in Concrete:
  1. Anchor in drilled holes with adhesive.
  2. Drill holes to diameter recommended by adhesive manufacturer's current printed instructions.
  3. Install adhesive in accordance with adhesive manufacturer's current printed installation instructions.
  4. Install rod lengths such that at least 1/4-inch length of rod projects beyond nut, after nut is tightened to final position.

### 3.5 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 1/8-inch.
- B. Maximum Offset from True Alignment: 1/16-inch.
- C. Maximum Out-of-position: 1/8-inch.

### 3.6 CLEANING

- A. Finished Metal Fabrication Surfaces: Remove soil and foreign matter from finished surfaces and keep clean.

### 3.7 PROTECTION

- A. Metal Fabrications: Apply protective coverings to prevent damage.

**END OF SECTION**