

SECTION 323000

SITE IMPROVEMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. This section is only a portion of the Contract Documents. All of the Contract Documents, including Conditions of the Contract and Division 1 General Requirements, apply to this section.

1.02 DESCRIPTION OF WORK

- A. The work of this section includes, but is not limited, to the following:

1. Concrete Footings for all Site Improvement Items
2. Grading and Compaction of Sub-Base
3. Concrete Filled Steel Bollards
4. Traffic and Parking Signs
5. Steel vehicular barrier gate
6. Stone School ID Sign
7. Salvaged Landscape Boulders
8. Flag Pole
9. Steel handrails for concrete stairs
10. Wood/Metal Bike Rack
11. Trash Receptable
12. Removable steel bollards
13. Cleaning, Repair and Protection

- B. The following items shown on the Drawings and/or noted herein shall be furnished under their Sections of the specifications:

1. Concrete filled steel bollard and steel handrails for concrete stairs shall be furnished under Section 055000 METAL FABRICATIONS and installed under this Section

1.03 RELATED WORK

- A. Carefully examine all the Contract Documents for requirements that affect the work of this Section. Other specification sections that directly relate to the work of this Section include, but are not limited to the following:

1. Section 033000 – Cast-in-Place Concrete
2. Section 055000 - Metal Fabrications
3. Section 311000 – Site Clearing and Preparation
4. Section 312000 – Earth Moving
5. Section 321313 – Exterior Concrete
6. Section 321200 - Asphalt Paving
7. Section 323100 - Fencing

8. Section 329100 – Loam and Planting Preparation
9. Section 334000 - Storm Drainage Utilities

#### 1.04 SUBMITTALS

- A. Shop Drawings: Refer to individual site improvements for submittal requirements.
- B. Provide manufacturer's product material information and system performance data along with material and system samples for each item specified in this Section for the Architect's review and approval prior to ordering materials.
- C. The General Contractor shall verify by field inspection that all items within this section conform to the specified requirements and approved submittals prior to installation.

#### 1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products and provide adequate protection against damage. Handle in strict compliance with manufacturer instructions and recommendations and store off the ground. Protect from all possible damage including, but not limited to chipping, staining, cracking and other damage. Sequence deliveries to avoid delays, but minimize on-site storage.

#### 1.06 COORDINATION

- A. The work of this Section shall be coordinated with that of other trades affecting, or affected by, this work as necessary to assure the steady progress of the work of this Contract.
- B. Substrates: Proceed with work only when substrate construction and penetrating work is complete.

#### 1.07 GUARANTEE

- A. In addition to the specific guarantee requirements of the GENERAL CONDITIONS and SUPPLEMENTARY GENERAL CONDITIONS, the Contractor shall provide the manufacturers' standard written warranty for each product within this specification. All of these guarantees shall be in addition to, and not in lieu of, other liabilities that the Contractor may have by law or other provisions of the Contract Documents.

### PART 2 - PRODUCTS AND EXECUTION (Combined)

#### 2.01 CONCRETE FOOTINGS FOR SITE IMPROVEMENT ITEMS

- A. Construct concrete footings as indicated on the Drawings.
- B. Concrete for footings shall have 28 day compressive strength of 4,500 PSI as specified in Section 321313 Exterior Concrete.
- C. Place concrete on moist subgrade or against prepared footings in continuous operation between transverse joints or individual sections. Vibrate all concrete. Do not place concrete in freezing temperatures or on frozen base

#### 2.02 GRADING AND COMPACTION OF SUB-BASE

- A. Do all necessary grading in addition to that specified under Section 312000 - EARTH MOVING to bring subgrade or foundation after final compaction to required grades and sections to obtain a foundation of uniform bearing surface. In absence of specific requirements, compact foundation by such means as shall provide firm base and insurance against settlement of superimposed work.
- B. Sub-base preparation, including material, shall be of properly approved quality as specified

under Section 312000 - EARTH MOVING. Start of work under this Section shall constitute acceptance of the foundation conditions to which this work is to be applied. Any defects in work resulting from such conditions shall be corrected under this Section 323000, Site Improvements, at no additional cost to the Owner.

#### 2.03 CONCRETE FILLED STEEL BOLLARDS

- A. Steel bollards shall be furnished, fabricated and hot-dipped galvanized under Section 055000 METAL FABRICATIONS.
- B. Bollards shall be Schedule 40 steel pipe with steel dome caps butt welded to bollard tops. Bollard caps shall conform to ASME SA-234 Grade B, Dimensions per ASME 16.9 for Schedule 40 pipe. Seam between bollard cap and pipe shall be smooth with no voids. Bollards shall be hot-dipped galvanized after fabrication.
- C. Bollards shall be filled with concrete supplied under Section 03 30 00 CAST IN PLACE CONCRETE by the General Contractor as shown on the drawings prior to installation.
- D. Concrete filled steel bollards shall be installed where indicated on the drawings and set in accordance with the Detail. Bollards to be set plumb, and to the exact depths and dimensions shown on the drawings. The Contractor shall verify bollard locations with the respective utility authority where applicable, prior to installation.
- E. Bollards shall be set prior to installation of adjacent pavement, lawn or other surface improvements that surround bollards.

#### 2.04 TRAFFIC AND PARKING SIGNS

- A. Provide highest quality 3M Scotchlite (or approved equal) on aluminum traffic signs. Sign backgrounds, legends and borders shall be fabricated from high-intensity encapsulated lens reflective sheeting conforming to the Massachusetts Department of Transportation's Standard Specifications for Highways and Bridges and the Manual on Uniform Traffic Control Devices (MUTCD), latest editions. Provide signs with the following characteristics, and per Signage Legend on the Drawings:
  - 1. Mounting: Tamperproof stainless steel bolted fasteners to 12-gauge galvanized steel 2" square posts, except where shown mounted to light poles or otherwise noted on plan. Final locations to be determined in field. Mounting height shall conform to MUTCD standards. Concrete footings per Contract Documents.
  - 2. Sign panels shall be 16-gauge aluminum panels. Sizes, color and copy as indicated on the Drawings.
  - 3. Lettering and symbols shall be surface applied 3M Scotchlite reflective vinyl material Series #580 or approved equal. All lettering shall be executed in such manner that all edges and corners of the letterforms are true, clean, correctly spaced, and photographically precise. All lettering and graphics must accurately reproduce the letterform. Colors shall be consistent with highway standards.
  - 4. Letterform meeting referenced standards. Where no standard exists, letterform shall be as selected by the Architect.
  - 5. Provide shop drawing submittal for those signs with no MUTCD code.

#### 2.04 HOT DIPPED GALVANIZED STEEL VEHICULAR BARRIER GATE

- A. Barrier gates and hinge posts shall be furnished, fabricated and hot-dipped galvanized under Section 055000 METAL FABRICATIONS. Install hot-dipped galvanized fabricated steel barrier gates as indicated on the drawings.

B. Acceptable Manufacturers:

1. Newgate Limited (Barriers Heavy Duty Manual Swing Arm), Newark, UK, 0808-156-1561
2. Hoover Fence Co. (V-series), Newton Falls, Ohio, 800-355-2335
3. Or approved equal.

C. Submittal:

1. Approved manufacturer's shop drawings shall become the basis for factory-finished surfaces and must therefore be submitted prior to installation.
2. The Contractor shall submit detailed shop drawings for footings for approval prior to installation. Drawings shall be prepared and sealed by a professional structural engineer (P.E.) experienced in design of similar structures and licensed in Massachusetts.

D. Materials:

1. Barrier gate and posts shall be manufactured from tubing, channels and rods, meeting the requirements of ASTM A 500-93 with an in line hot dipped Galvanized exterior zinc coating. The tubing finish will have an in-line hot dipped Galvanized Zinc coating, with a clear organic exterior coating and gray interior rust preventing coating. This material will have a minimum yield of 46,000 psi.
2. The manufacturer will supply gate hardware of sufficient size and capacity to support the specified gate.
3. Finish shall be an eight-stage pre-treatment and a four-stage corrosion resistant powder coating process. The finish shall conform to local environmental air quality standards. The landscape architect shall select the color from the fabricators list of standard colors, 6 minimum offerings, shall include Black and Deep Green.

E. Fabrication:

1. New prime material/galvanized steel, conforming to specified ASTM standards, shall be used in the manufacture of gates and posts.
2. Gates and posts shall be of welded construction by the gas metal arc method. The layout and welding shall be carried out by experienced craftsmen making sure all welds are neat, clean and of sizes matching those indicated on the drawing. Any and all flush welds shall be ground smooth.
3. After fabrication all posts, panels and gates shall be pre-treated to insure optimum coating adherence to the metal.

F. Installation:

1. Posts shall be set according to the spaces shown on the shop drawings. All posts shall be set plumb and level. Footing sizes shall be as indicated on the shop drawings as well as posts caps.
2. Gates, where indicated on the Drawings, shall be installed according to the style and sizes indicated on the shop drawings and shall be installed plumb and level. Any required gate stops will be installed by the Contractor. To assure alignment of any padlock provisions or strikes, gate attachment will be done in the field. When installation is complete the Contractor will be responsible for lubricating the hinges, rollers and other gate hardware.

2.05 SCHOOL IDENTIFICATION SIGN

- A. The school identification stone sign shall be a large boulder with one relatively flat side to accommodate engraved and painted lettering.
  - 1. The single stone boulder shall be imported if salvaged boulders from Earth Moving operations are found unacceptable for any reason by the the landscape architect.
  - 2. The color and texture shall be consistent in appearance. There shall be no defects or damage from machinery on any exposed sides.
  - 3. Provide photographs of the boulder from all angles for approval.
  - 4. Submit lettering examples in font and color identified on the dwgs.
  - 5. Example photo appearance and lettering:



#### 2.06 SALVAGED LANDSCAPE BOULDERS

- A. All existing and new boulders found during construction shall be salvaged and secured by the contractor at a secure location on site
- B. Location and Qty (Range of 25-30) of salvaged boulders to be selected by the Architect and placed on site during construction administration. Placement shall include adjustment of exposed face or orientation. The Contractor shall work with the Architect until approved orientation is achieved.
- C. Excavate to the lines and grades shown on the Contract Documents, and embed approximately 1/4 minimum of boulder below finish grade.

#### 2.07 FLAG POLE

- A. Submit complete and detailed shop drawings indicating entire flagpole, installation, foundation and all accessories. Furnish and install flagpoles in the quantities and locations indicated in the Drawings.
- B. Flagpole shall be Model No.EC40IH as manufactured by Eder Manufacturing, Oak Creek, WI; Phone: (414) 764-3522 or one of the following approved equals:
  - a. Model LIB-ESR40C81 as manufactured by Liberty Flagpoles, Inc. (<https://www.libertyflagpoles.com>)
  - b. Model ESR40C82 as manufactured by Colonial Flag, Inc. (<https://www.colonialflag.com>)
- C. Finish to be brushed satin aluminum finish with internal halyard and stainless steel cable assembly.
- D. Flash Collar: Spun aluminum ground collar and ground sleeve for height of pole specified.

- E. Shim blocks shall be pressure treated hardwood wedges at top of foundation tube to adjust pole and maintain true vertical position. Lightning Protection: 3/4 inch diameter steel lightning protector ground spike welded to base plate and to support plate.
- F. Installation: Coordinate flagpole uplighting, refer to Electrical drawings. Install flagpoles in accordance with the manufacturer recommendations and approved shop drawings. Set flagpoles plumb and true and firmly wedged into foundation sleeve in the locations indicated on the Drawings. Install all parts and accessories such that the flagpole shall be in fully functional and proper operating condition.
- G. Furnish and install (1) 10x15 heavy Duty American flag of woven 2 ply polyester at 50' flagpole. Made in the USA.

## 2.08 GALVANIZED STEEL HANDRAILS AT CONCRETE STAIRS

- A. Submittals: Manufacturer's data including instructions, recommendations, and restrictions. Submit for each material and product. Provide shop drawings engineered, prepared, sealed, and signed by the Contractor's engineer.
- B. Steel tubing for handrails, shall be round seamless steel pipe in accordance with ASTM A53/A53M-99B. Sizes and layout shall be as shown on the drawings. Factory applied powder coat color:
- C. Steel Railings: Factory applied powder coat colors: Custom RAL colors to be selected and approval by Landscape Architect.
- D. Welding and Finishing: Refer to Item 2.04 for welding, galvanization and Factory-Applied Architectural Finish Powder Coat Finish Over Galvanized Steel process.
- E. Fabrication; As shown or, if not shown:
  - 1. Match design intent indicated
  - 2. Meet all Codes including barrier free regulations and requirements.
  - 3. Provide welded assembly.
  - 4. Return rail ends to walls or as indicated on drawings.
  - 5. Cap all visible ends and hollow members with welded caps.
  - 6. Fully shop fabricate work to the maximum extent possible.
  - 7. Shop prefit field seams and joints.
- F. Touch-up and Repair: For damaged coated surfaces, clean welds, bolted connections and abraded areas:
  - 1. At galvanized surfaces, apply organic zinc repair paint complying with requirements of ASTM A780. Galvanizing repair paint shall have 65 percent zinc by weight. Thickness of applied galvanizing repair paint shall be not less than coating thickness required by ASTM A123 or A153 as applicable. Touch-up of galvanized surfaces with aerosol spray, silver paint, bright paint, or aluminum paints is not acceptable.
- G. Warranty: The galvanizer shall furnish a warranty stating that the galvanizing topcoated in accordance with the specification shall remain free from more than 10% (percent) rust for a period of twenty (20) years.
- H. Handling: Galvanizer shall handle, pack, and ship in such a manner as to minimize damage to the finish. Upon arrival at job site it shall be the Contractor's responsibility to take equal

precautions. Since some surface damage is inevitable, suitable touch-up material shall be readily available from the galvanizer for the Contractor's use.

- I. Shop Drawings: The contractor is required to provide detailed shop drawings for all metal fabrications specified herein.
1. Stair and Ramp Handrails: The Contractor shall submit detailed final drawings plans, sections and elevations for approval prior to ordering materials.
2. Contractor shall submit a full color palette selection of CUSTOM color choices for approval by architect for all factory applied color galvanized materials.

## 2.09 BICYCLE RACKS

- A. Bike racks shall be "Rough and Ready Bike Parking" by Street Life Site Furnishing [www.streetlifeamerica.com](http://www.streetlifeamerica.com) Phone – 646 583 2937 or approved equal.
  - 1 Bike racks shall hot dipped galvanized posts embedded into concealed concrete footings with a secure hardwood bar
  - 2 Approved Alternates:
    1. "Edgetyre" by Modern Design Site Furnishings
    2. "Emerson" Bike Rack by Landscape Forms

## 2.10 TRASH/RECYLING RECEPTACLES

- A. The standard of quality, design and function required for Trash and recycling receptacles is based on "Chase Park Litter Receptacle" by Landscape Forms Contact Nadene Worth [nadenew@landscapeforms.com](mailto:nadenew@landscapeforms.com). The dimensions of the trash receptacle shall be 24" x 39" with a side opening. The capacity of the trash receptacle will be around 36 gallons

Approved Alternates:

- 1) Steelsites" Series, manufactured by Victor Stanley Inc., Dunkirk, Maryland 20754. Tel: 800.368.2573, [www.victorstanley.com](http://www.victorstanley.com),
- 2) Manor 2834-FT Flat Top Litter Container by Timber Form Site Furnishings ([www.site-furnishings.columbia-cascade.com](http://www.site-furnishings.columbia-cascade.com) )

## 2.11 REMOVABLE STEEL BOLLARDS

- A. Furnish and install lockable removable bollards as detailed in the drawings and recommended by the manufacturer.
- B. Basis of design for removable bollards shall be by Reliance Foundry, Surrey, BC (Canada) 877-789-3245, model R-8464-30 or approved equal.
- C. Bollard shall be constructed of galvanized steel and powder coated over epoxy primer in a standard color. Height 30". It shall include internal locking hardware, keys and reflective tape. Submit product data, color samples and warranty documentation for approval.
- D. The assembly shall include an in-ground mounted receiver (and receiver cover) embedded in concrete.

## 2.12 CLEANING, REPAIR AND PROTECTION

- A. Repair minor damage to eliminate all evidence of repair. Remove and replace work that cannot be satisfactorily repaired.

- B. Provide temporary protection to ensure that the work will be without dirt, stains, damage or deterioration at time of final acceptance. Clean up stains and spills as they occur. Remove protections and clean as necessary immediately before final acceptance.
- C. Upon completion of the work and before acceptance, the Contractor shall remove and dispose of in an approved manner all surplus materials, rubbish, etc. which the Contractor may have accumulated during the course of the work and shall leave the site in a clean and orderly condition. The Contractor shall not abandon any material at or near the site regardless of whether or not it has any value.

END OF SECTION