

SECTION 02300

EARTHWORK

A. SUMMARY

1. Excavation and filling.

B. SUBMITTALS

1. Test results of off site fill material: Required
2. Compaction results: Required

C. QUALITY ASSURANCE

1. Regulatory requirements – State and Local Codes.
2. Comply with Geotechnical Engineer recommendations for subgrade fill material and compaction requirements.
3. Comply with Geotechnical Engineer recommendations for building foundation backfill, fill under pavement, fill at landscaped areas and fill at retaining wall.

D. MATERIALS

1. Comply with recommendations of the D/B's Geotechnical Engineer regarding reuse of on site materials and appropriate imported materials.
2. Topsoil: Reusable excavated or Imported Friable Loam.
3. Subsoil: Imported or Excavated material.
4. Aggregate Material: Coarse natural stone crushed.
5. Sand: Natural river or bank sand.
6. Accessories: Laminated reinforced vapor barrier.

E. SUBSOIL EXCAVATION

1. Excavate subsoil required for building foundations, construction operations, and other work.

F. TRENCHING

1. Excavate for storm sewer, and water piping conduit.
2. Support pipe and conduit during placement and compaction of bedding fill.

G. BACKFILLING

1. Backfill areas and trenches to required contours and elevations.
2. Place and compact fill materials in continuous layers in accordance with the Geotechnical Engineers recommendations.
3. Slope grade away from building minimum 2.5 inches in 10 feet.

H. PLACING TOPSOIL

1. Place topsoil in areas where seeding, sodding and planting is scheduled.

I. FIELD QUALITY CONTROL

1. Field Compaction Tests: Required.
2. Field Inspection: Required.

END OF SECTION

SECTION 02826

ORNAMENTAL METAL FENCES AND GATES

**PART 1 GENERAL**

1.01 SUMMARY

A. Section Includes:

1. Decorative metallic-coated steel security fences.

B. Related Documents: The Contract Documents, as defined in Section 01110 - Summary of Work, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents.

C. Related Sections:

1. **Section 02300 - Earthwork**
2. **Section 03300 - Concrete**

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
2. ASTM A924/A924M – Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot Dip Process.
3. ASTM A1011/A101M – Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength and High-Strength Low-Alloy with Improved Formability.
4. ASTM B117 – Practice for Operating Salt Spray (Fog) Apparatus
5. ASTM D523 – Test Method for Specular Gloss
6. ASTM D822 – Practice For Conducting Tests on Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
7. ASTM D1654 – Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
8. ASTM D2244 – Test Method for Calculation of Color Differences From Instrumentally Measured Color Coordinates.
9. ASTM D2794 – Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact).
10. ASTM D3359 – Test Method for Measuring Adhesion by Tape Test.

1.03 SUBMITTALS

A. Section 01330 - Submittal Procedures: Procedures for submittals.

1. Shop Drawings: Submit shop drawings sealed by a registered professional engineer in the State of Texas indicating location, size, details, and quantity of all concrete and steel components and accessories.

2. Manufacturers Product Data: Submit manufacturer's product data and installation procedures.
3. Samples: Color selection finishes and types.
4. Preinstallation Conference: Conduct conference at Project site.

#### 1.04 QUALITY ASSURANCE

##### A. Qualifications:

1. Manufacturer: Company specializing in manufacturing Products specified with minimum 5 years documented experience.
2. Installer: Company specializing in performing the Work of this Section with minimum 5 years documented experience.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 – Material and Equipment: Transport, handle, store, and protect Products.
- B. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism, and theft.

### **PART 2 PRODUCTS**

#### 2.01 MANUFACTURERS

- A. Subject to compliance with project requirements, manufacturers offering Products which may be incorporated in the Work include the following:
  1. Ameristar Fence Products, Inc., Tulsa, OK (800) 321-8724
  2. Superior Aluminum Products, Inc., Russia, OH (937) 526-4065
  3. XCEL Fence, Inc., La Verne, CA (909) 392-0808

#### 2.02 MATERIALS

- A. Steel material for fence framework (i.e., tubular pickets, rails, and posts), when galvanized after forming, shall conform to the requirements of ASTM A1011/1011M, with a minimum yield strength of 50,000psi. The exterior shall be hot-dip galvanized with a 0.45oz per sq. ft minimum zinc weight. The interior surface shall be coated with a minimum 81% nominal zinc pigmented coating, 0.3 mils minimum thickness.
- B. Steel material for fence framework (i.e., tubular pickets, rails, and posts), when galvanized prior to forming, shall conform to the requirements of ASTM A924/924M, with a minimum yield strength of 50,000psi. The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90oz per sq. ft., Coating Designation G-90.
- C. The manufactured galvanized framework shall be subjected to a thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, a pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish.
  1. The base coat shall be a zinc-rich thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm).

2. The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm).
3. Verify topcoat color with Architect.
4. The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 1.

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117 & D1654	Corrosion Resistance over 3,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

**Table 1 – Coating Performance Requirements**

- D. Material for fence pickets shall be 1" square x 14ga. tubing. The cross-sectional shape of the rails shall conform to the manufacturer's double wall roll-formed design with outside cross-section dimensions of 1.75" square and a minimum thickness of 14ga. Picket holes in the rail shall be spaced 4.98" o.c. Picket retaining rods shall be 0.125" diameter galvanized steel. Posts shall be a minimum of 2-1/2" square x 12ga. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections.

## 2.03 FABRICATION

- A. Pickets, rails, and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.
- B. Grommets shall be inserted into the pre-punched holes in the rails and pickets shall be inserted through the grommets so that pre-drilled picket holes align with the internal upper raceway of the rails. Retaining rods shall be inserted into each rail so that they pass through the predrilled holes in each picket, thus completing the panel assembly.
- C. Completed panels shall be capable of supporting a 600lb. load (applied at midspan) without permanent deformation. Panels without rings shall be bi-axial to a 25% change in grade.
- D. Gates shall be fabricated using panel material and gate ends should be greater than or equal to the outside cross-section dimensions as the rail. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined either by welding or by the same retaining rod process used for panel assembly.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.
- B. Do not begin installation before final grading is completed unless otherwise permitted by Owner's Representative.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 PREPARATION**

- A. All new installation shall be laid out by the contractor in accordance with the construction plans.

**3.03 INSTALLATION**

- A. Fence posts shall be set per manufacturers recommendations depending on the nominal span specified.
- B. Gate posts shall be spaced according to the gate openings specified in the construction plans. The "Earthwork" and "Concrete" sections of this specification shall govern post base material requirements. Panels shall be attached to posts using mechanically fastened panel brackets supplied by the manufacturer.

**3.04 CLEANING**

- A. The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

END OF SECTION