

## 1620 - MATERIALS FOR FENCING

### SECTION 1620

#### MATERIALS FOR FENCING

##### 1620.1 DESCRIPTION

This specification governs the ferrous and nonferrous materials and components utilized in the construction of fences of various types.

##### 1620.2 REQUIREMENTS

**a. General.** Fencing materials and components governed through this specification must comply with **subsection 1620.2b** unless specified otherwise in the Contract Documents. The height and design of any fence is to be as specified in the Contract Documents. This also applies to, but is not restricted to, wire diameters, mesh size, tension bar dimensions, selvage type, brace and tension bands, post caps, sleeves, rail ends, and other miscellaneous and accessory components associated with the type of fence specified.

##### **b. Material Specifications.**

(1) Chain Link Fence. Provide chain link fence that complies with AASHTO M 181. Provide framework (post and rail) components that comply with ASTM F 1043 for heavy industrial fence with only pipe Group IA or IC permitted.

When polymer-coating is specified in the contract documents, provide chain link fence that complies with AASHTO M 181, Type IV, Class A, extruded and bonded; or Type IV, Class B. Use the color specified in the Contract Documents that complies with AASHTO M 181 or ASTM F 934.

Provide accessory and miscellaneous components that comply with ASTM F 626. Components not specifically addressed in this or the other specifications must comply with the Chain Link Fence Manufacturer's Institute (CLFMI) Product Manual, CLF 2445. Tension bars are to have nominal dimensions of not less than 3/16 inch by 3/4 inch and may not be more than 2 inches shorter than the height of the chain link fabric they are applied to. Brace and tension bands are to have nominal dimensions of not less than 3/32 inch by 7/8 inch and comply with the cross section profile of the posts they are to be applied to. Truss rods are to have a minimum nominal diameter of 3/8 inch.

The terminology applied to chain link fencing is to be consistent with ASTM F 552.

The corrosion protection coating requirements of AASHTO M 181 apply to all components and supersede less stringent requirements that may occur in other specifications.

(2) Chain Link Fence (Special). Provide Chain Link Fence (Special) that complies with **subsection 1620.2b.(1)**, except provide pipe or tubing for framework that complies with the following:

- Nominal Pipe Size (NPS) as shown on the Contract Documents.
- Outside diameter and wall thickness corresponding to Extra Strong Pipe (Schedule 80).
- ASTM A 53, Grade B; ASTM A 500, Grade B, C or D; ASTM A 501, Grade A; or ASTM F 1083 Intermediate Strength Grade (use only for size NPS 5 or larger). ASTM F 1083 High Strength 83,000 Grade may be used for framework that is not welded to a base plate or other component.
- Other pipe or tubing will be approved provided it meets the dimensional requirements and the tensile and chemical requirements of one of the materials listed above.

Do not use continuous, furnace butt-welded (Type F) pipe.

(3) Barbed Wire. Provide zinc-coated and aluminum-coated steel barbed wire that complies with AASHTO M 280.

All barbed wire is to have dual line wires, each of 0.1 inch minimum nominal diameter, with four point round wire barbs, 0.08 inch minimum nominal diameter wire, at a nominal spacing of 5 inches. The dual line wires must have a unidirectional twist and have the barbs applied to one line wire only unless they are interwoven through the line wires. A Class 3 coating level is required for zinc coated barbed wire.

(4) Woven Wire Fabric (horizontal line wires, vertical stay wires). Provide zinc-coated and aluminum-coated steel woven wire fence fabric that complies with AASHTO M 279. A Class 3 coating level is required for zinc-coated woven wire fence fabric, and the minimum permissible line wire breaking strength is 960 pounds.

(5) Steel Fence Posts and Assemblies. Except as addressed previously in **subsection 1620.2b.(1)** and **(2)**, provide posts and assemblies that comply with AASHTO M 281.

(6) Zinc-Coated Steel Wire Strand. Provide strand for use in conjunction with fences that complies with

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ASTM A 475.

(7) Swing or Slide Type Gates. Provide gates that comply with ASTM F 900 for swing type and ASTM F 1184 for slide type. The wire or fabric utilized in the fence construction is to be applied to the gate frame unless specified otherwise through **subsection 1620.2a**. It will be an option to require hot dip galvanizing of the frame after weld construction.

(8) Accessory and miscellaneous components not referenced previously in a specification or this subsection must be zinc coated in compliance with ASTM A 153 for hot dip galvanizing or ASTM B 633 for electrodeposited zinc on threaded fastener components of nominal size of less than 1/2 inch diameter. Mechanically deposited zinc coatings on larger fastener components is permitted, however, other than the zinc coating application method, all requirements of ASTM F 2329 must be complied with. Fastener components must comply with **SECTION 1616**. Aluminum coating is acceptable when permitted and regulated by the specification that governs the component.

### **c. Fence (Chain Link) (Special) (Duplex/PVC).**

(1) All posts, hardware, etc. Perform the following duplex protection requirements in order listed:

- Use Fence (Chain Link) (Special) as specified in this specification, and galvanize according to **subsection 1620.2b**.
- smooth out any drips, dross or ash inclusions
- Do not quench bath galvanized surfaces that are to be duplex coated. Clean using alkaline cleaners, ammonia cleaners or solvent. Passivating film is prohibited;
- Rinse with clean water;
- Dry completely;
- Prepare the surface according to ASTM D 6386 and the following:
  - Blast clean with SSPC-SP-7 using abrasives softer than zinc;
    - Aluminum-Magnesium Silicates;
    - Walnut shells;
    - Sand with a Mohs hardness equal to or less than 5, and between 200-500 grit;
    - Temperature must be > 70° and less than 50% humidity;
- After blasting, leave a minimum of 3.3 mils of galvanizing with a + tolerance of 2 mils;
- Powder coat;
  - Use polyester powder with degassing agents;
  - Preheat materials to be powder coated;
  - Powder coat a thickness of 3.5 to 4 mils;
  - Measure and report galvanizing thickness before and after blasting and report the powder coat thickness;
  - Perform Methyl Ethyl Ketone (MEK) test, and report the results; and
  - Perform Cross Hatch test according to ASTM D 3359, and report the results.

(2) Woven Chain Link. Use the same specified color that was used for the posts, hardware, etc. When no color is specified, use black. The PVC coating shall conform to AASHTO M 181 Type IV Class A.

### **1620.3 TEST METHODS**

Conduct all tests required by the applicable AASHTO, ASTM, or other material specifications of **subsection 1620.2b** and **c**. Coating thickness may be measured by any one of the methods specified in ASTM B 633 and by eddy current methods, ASTM E 376 (B 244 may also be useful as a technique guideline), provided that appropriate calibration procedures and standards have been applied. The magnetic induction and eddy current methods are nondestructive in nature and are preferred. Destructive techniques, i.e., coating removal, may be utilized as referee methods.

### **1620.4 PREQUALIFICATION**

Not applicable.

### **1620.5 BASIS OF ACCEPTANCE**

**a.** Submit for approval a Type B certification, as specified in **DIVISION 2600**, that governs all wire utilized in the construction of the fence or fence components, regardless of application.

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**b.** Submit for approval a Type B certification, as specified in **DIVISION 2600**, that governs all post and rail utilized in the construction of Chain Link Fence (Special). Provide certifications that show all information necessary to verify compliance with the dimensional requirements of this specification.

**c.** Submit for approval a Type B certification as specified in **DIVISION 2600**, that governs the Duplex/PVC Protection utilized in the construction of Fence (Chain Link) (Special). Provide certifications that show all information necessary to verify compliance with the requirements of this specification.

**d.** Receipt and approval of a Type D certification as specified in **DIVISION 2600** for all other fencing components.

**e.** Inspection and testing by field personnel of all fencing components for compliance with corrosion protection coating thickness, dimensional requirements, quality of workmanship and the delivery condition.