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## SECTION 05500

## MISCELLANEOUS METALS

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

## 1.1.1 American Society for Testing and Materials (ASTM).

ASTM A 36	(1993a) Structural Steel
ASTM A 53	(1993b) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
ASTM A 126	(1993) Gray Iron Castings for Valves, Flanges and Pipe Fittings
ASTM A 307 Studs,	(1992a) Carbon Steel Bolts and 60,000 PSI Tensile Strength
ASTM A 320 Materials	(1992) Alloy Steel Bolting for Low-Temperature Service
ASTM B 32	(1993) Solder Metal
ASTM B 211	(1992a) Aluminum and Aluminum-Alloy Bar, Rod, and Wire
ASTM C 270	(1995) Mortar for unit Masonry
ASTM C 476	(1995) Grout for Masonry

## 1.1.2 American Welding Society (AWS).

AWS D1.1	(1992) Structural Welding Code - Steel
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## 1.1.3 Federal Specification (FS).

FS QQ-B-750 Plate,	(Am 2) Bronze, Phosphor; Bar, Rod, Sheet, Strip, Flat Wire, and Structural and Special Shaped Sections
FS QQ-S-763	(Rev E; Am 1) Steel Bars, Wire,

## PART 2 PRODUCTS

## 2.1 General

Materials indicated on the drawings or required in the work and not covered elsewhere by detailed requirements shall conform to the requirements of this section. In all cases not specifically covered in these specifications, the Contractor shall furnish approved highest grade commercial materials or products.

## 2.2 Structural Steel

Structural Steel shall conform to ASTM A 36.

## 2.3 Steel Pipe

Steel Pipe shall conform to ASTM A 53, Grade B, Type E or S, Galvanized, nominal size and weight, class as shown on the drawings, plain ends.

## 2.4 Corrosion-Resisting Steel Bolts and Anchor Bolts

Corrosion-Resisting Steel Bolts and Anchor Bolts shall conform to FS QQ-S-763, Class 304, Condition A, or the applicable requirements of ASTM A 320, Grade B8.

## 2.5 Bronze

Bronze shall conform to FS QQ-B-750, hard temper of either composition.

## 2.6 Bolts, Nuts, and Washers

Bolts, Nuts, and Washers shall be of the material, grade, type, class, style, and finish indicated or best suited for intended use.

2.6.1 Bolts and Nuts shall conform to ASTM A 307, Grade A, hot-dip galvanized.

## 2.7 Cast Iron for Flap Gates

Cast Iron for Flap Gates shall conform to ASTM A 126, Class B.

## 2.8 Coal Tar Base Paint

Coal Tar Base Paint shall be as recommended by the manufacturer. A special primer shall be used only if recommended by the manufacturer of the coating.

## 2.9 Shear Pins

Shear Pins shall be manufactured from aluminum conforming to ASTM B 211, Alloy 1100,

## PART 3 EXECUTION

## 3.1 FINISHES

In general, tolerances for machine-finished surfaces designated by nondecimal dimensions shall be within 1/64 inch. Sufficient machining stock shall be allowed on placing pads to insure true surfaces of solid material. Finished contact or bearing surfaces shall be true and exact to secure full contact. All drilled holes for bolts shall be accurately located and drilled from templates.

Bolt holes shall be reamed normal to the member and shall be truly cylindrical throughout. Unless otherwise specified, holes for bolts shall not be more than 0.2 inch larger than the diameter of the bolt.

## 3.2 ANCHORAGE

Anchorage shall be provided where necessary for fastening miscellaneous metal items securely in place. Anchorage not otherwise specified or indicated shall include slotted inserts, expansion shields, and power-driven fasteners when approved for concrete. Slotted inserts shall be of types required to engage with the anchors and shall be approved.

## 3.3 WELDING

Welding of steel shall conform to applicable provisions of AWS D1.1. Welders and welding operators for steel shall pass the qualification tests prescribed by AWS D1.1. The welders and welding operators so qualified shall be certified by name. The date qualified and the code under which qualified shall be on the certificate. Prior qualification will be acceptable only when the Contractor certifies that the welder has performed satisfactory work using the process in all positions for which qualified within the preceding three months. The Contractor shall require welders and welding operators to repeat the qualifying tests when in the opinion of the Contracting Officer their work indicates a reasonable doubt of proficiency. Those passing the prequalification tests shall be recertified. Those not passing shall be disqualified until passing. All expenses in connection with qualification and prequalification shall be borne by the Contractor.

## 3.4 WORKMANSHIP

Miscellaneous metalwork shall be well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching shall produce clean, true lines, and surfaces. Welding shall be continuous along the entire area of contact, except where tack welding is permitted. Exposed connection of work in place shall not be tack welded. Exposed welds shall be ground smooth. Exposed surfaces of work in place shall have a smooth finish, and unless otherwise approved, exposed riveting shall be flush. Where tight fits are required, joints shall be milled. Corner joints shall be coped or mitered, well formed, and in true alignment. Work shall be accurately set to established lines and elevations and securely fastened in place. Installation shall be in accordance with manufacturer's installation instructions and approved drawing, cuts, and details.

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