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DIVISION 05 - METALS

SECTION 05500

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SECTION 05500

MISCELLANEOUS METAL

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 basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

| | |
|------------|--|
| ASTM A 36 | (1994a) Carbon Structural Steel |
| ASTM A 48 | (1994a) GRAY IRON CASTING |
| ASTM A 53 | (1995a) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless |
| ASTM A 123 | (1989a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products |
| ASTM A 320 | (1994a) Alloy Steel Bolting Materials for Low-Temperature Service |
| ASTM B 32 | (1993) Solder Metal |

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

| | |
|------------|---|
| ASME B16.3 | (1992) Malleable Iron Threaded Fittings |
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AMERICAN WELDING SOCIETY (AWS)

| | |
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| AWS D1.1 | (1994) Structural Welding Code - Steel |
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FEDERAL SPECIFICATIONS (FS)

| | |
|-------------|---|
| FS FF-B-575 | (Rev C) Bolts, Hexagon and Square |
| FS FF-N-836 | (Rev D; Am 3) Nut: Square, Hexagon, Cap, Slotted, Castle, Knurled, Welding and Single Ball Seat |
| FS FF-S-325 | (Basic; Int Am 3; Notice 1) Shield, Expansion; Nail, Expansion; and Nail, Drive Screw (Devices, Anchoring, Masonry) |
| FS QQ-S-763 | (Rev E; Am 1) Steel Bars, Wire, Shapes, and Forgings, Corrosion Resisting |

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

SD-04 Drawings

Miscellaneous Metal Items; GA.

Detail drawings indicating material thickness, type, grade, and class; dimensions; and construction details. Drawings shall include catalog cuts, erection details, manufacturer's descriptive data and installation instructions, and templates. Detail drawings for the following items: trash rack structures, flow constrictor structure, cover plates and frames, access gates, spillway staff gages and other miscellaneous metalwork.

1.3 GENERAL REQUIREMENTS

The Contractor shall verify all measurements and shall take all field measurements necessary before fabrication. Welding to or on structural steel shall be in accordance with AWS D1.1. Items specified to be galvanized, when practicable and not indicated otherwise, shall be hot-dip galvanized after fabrication. Galvanizing shall be in accordance with ASTM A 123 as applicable. Exposed fastenings shall be compatible materials, shall generally match in color and finish, and shall harmonize with the material to which fastenings are applied. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, shall be included. Poor matching of holes for fasteners shall be cause for rejection. Thickness of metal and details of assembly and supports shall provide strength and stiffness. Joints exposed to the weather shall be formed to exclude water.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 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 which are suitable for the intended use of the item.

2.1.2 Structural Shapes and Plates

Steel structural shapes and plates shall conform to ASTM A 36. Galvanized coatings where required, shall conform to ASTM A 123.

2.1.3 Steel Pipes

Steel pipe shall conform to ASTM A 53, Type E or S, Grade A, galvanized nominal size and weight unless noted otherwise.

2.1.4 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.

2.1.5 Pull Boxes

Pull Boxes are to be Cast Iron Electrical Pull Boxes, Type 1677 as

manufactured by Alhambra Foundry Co. Ltd. or approved equal. Cast iron for Pull Boxes shall conform to ASTM A 48, Class 30B.

2.1.6 Bolts

Bolts shall conform to FS FF-B-575. 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.

2.1.7 Nuts

Nuts shall conform to FS FF-N-836. Nuts shall be galvanized.

2.1.8 Expansion Anchors

Expansion anchors shall conform to the applicable requirements of FS FF-S-325. Anchors shall be multiple unit with inside thread.

2.1.9 Pipe Caps

Pipe caps shall conform to ASME B16.3.

2.1.10 Trash Rack Gratings and Steel Flow Constrictor

Trash rack gratings and steel flow constrictor shall be fabricated of steel conforming to ASTM A 36 and steel pipe conforming to ASTM A 53 standard weight.

2.1.11 Cover Plate

Cover plates shall conform to FS QQ-F-461, Class 1, Pattern No. 7, 10, 12, or 17. Sharp edges and burrs shall be removed from plates.

2.1.12 Manhole Steps

Manhole steps shall conform to Uniform Standard Drawing, Clark County Area, Nevada, 1988 Drawing No. 410 Standard.

2.1.13 Concrete, MORTAR AND GROUT

Cast-In-Place Structural Concrete, mortar and grout shall conform to the requirements of Section 03301 CAST-IN-PLACE STRUCTURAL CONCRETE.

PART 3 EXECUTION

3.1 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. Steel with welds will not be accepted, except where welding is definitely specified or called for on the drawings. All bolts, nuts, and screws shall be tight. Work shall be accurately set to established lines and elevations and securely fastened in place. Anchorage shall be provided where necessary for fastening miscellaneous metal and wood items securely in place. Anchorage not otherwise specified or indicated shall include slotted inserts made to engage with the anchors, expansion shields, and power-driven fasteners when approved for concrete; machine and carriage

bolts for steel; and lag bolts and screws for wood.

3.2 FINISHING

In general, tolerances for machine-finished surfaces designated by nondecimal dimensions shall be within 0.4 mm. Sufficient machining stock shall be allowed on placing pads to insure true surfaces of solid material.

Finished contacts of bearing surfaces shall be true and exact to secure full contact. All drilled holes for bolts shall be accurately located and drilled from templates.

3.3 ZINC COATING (GALVANIZING)

Zinc coatings shall be applied in a manner and of a thickness and quality conforming to ASTM A 123. All exposed ferrous metalwork, except cast-iron and corrosion resistant steel and items to be completely embedded in concrete, shall be galvanized unless other protective coatings are specified. Metalwork shall be galvanized after fabrication. In the event that any portion of galvanized metalwork is abraded or otherwise damaged to the extent that the base metal is exposed, such damaged or abraded portions shall be neatly covered with Grade 50B solder conforming to the requirements of ASTM B 32.

3.4 WELDING

Welding shall conform to the provisions of AWS D1.1. Welders who have not been certified within two years of the date of commencement of work under this contract will not be allowed to perform the work.

3.5 BOLTED CONNECTIONS

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 1.60 mm larger than the diameter of the bolt. Cutting bolt holes with a torch will not be permitted without the prior written approval of the Contracting Officer. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, shall be included. Poor matching of holes for fasteners shall be cause for rejection. Fastenings shall be concealed where practicable.

3.6 EXCAVATION

Excavation for concrete-embedded items shall be of the dimensions indicated on the drawings. Holes shall be cleared of loose materials prior to placement of concrete.

3.7 ACCESS GATE

Access gates shall be installed at the locations indicated on the drawings.

Access gates shall be fabricated in the shop from standard weight steel pipe conforming to ASTM A 53. All access gate components shall be galvanized. Welded, cut, damaged, and deformed areas of galvanizing metal shall be neatly coated with Grade 50B solder conforming to ASTM B 32. The gates shall be installed in such a fashion that they work freely. The Contractor shall examine the operation of all pipe gates not sooner than 30 days after installation for ease of operation. Any gates that cannot be operated by one person will be repaired (including any required structural modifications) by the Contractor at no additional cost to the Government, and requirements for repair shall conform to the requirement for

installation above.

3.8 TRASH RACK GRATINGS

Trash rack gratings shall be of the type and size specified or shown on the drawings and shall be fabricated to accurately fit the supporting member. Opening shall be provided as shown on the drawing or as required. Trash rack grating and connections shall be galvanized after fabrication.

3.9 STEEL FLOW CONSTRICTOR STRUCTURE

Steel flow constrictor structure at the inlet to the outlet works conduit shall be of the type and size specified or shown on the drawings and shall be fabricated to accurately fit the supporting member. Openings shall be provided as shown on the drawings or as required. Sharp edges and burrs shall be removed from plates. Constrictor plates and shapes shall be galvanized after fabrication.

3.10 SEDIMENT STAFF GAGES AND PIPE BOLLARDS

Sediment Staff gages and Pipe Bollards shall be fabricated with heavy duty steel pipe conforming to ASTM A 53, Type E or S, weight STD, black finish as shown on the drawings. Sediment staff gages and pipe bollards shall be set vertically in concrete encasements. Concrete for encasements and pipe fill where indicated shall be as specified in SECTION 03301 CAST-IN-PLACE STRUCTURAL CONCRETE having a compressive strength of 21 MPa.

3.11 SPILLWAY STAFF GAGES

Steel structural members for spillway staff gages shall be of the type and size specified or shown on the drawings. The spillway staff gages shall be set vertically and fastened to the Roller Compacted spillway walls with anchor bolts as shown. Space and voids between the spillway wall and the staff gages shall be filled with grout. Steel members and plates for staff gages shall be galvanized after fabrication. Elevation numbers and markings painted on the installed gages shall correspond to the correct surveyed elevation within a tolerance of one inch.

3.12 PAINTING

Painting of Sediment Staff Gages, spillway staff gages, and Pipe Bollards shall be in accordance with the requirements of the UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA, SECTIONS 614 AND SECTION 714.

3.13 HYDROLOGIC INSTRUMENTATION VAULT

3.13.1 Steel Cover Plates and Frames

Steel cover plates and frames shall be of the type and size specified or shown on the drawings and shall be fabricated to accurately fit the supporting member. Openings shall be provided as shown on the drawings or as required. Steel cover plates and frames shall be galvanized after fabrication.

3.13.2 Ladder Steps

Ladder Steps shall be set as shown on the drawings.

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