Preparing Activity: USACE Superseding
UFGS-35 20 14 (April 2008)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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USACE / NAVFAC / AFCEC / NASA	**UFGS-35 20 14 (August 2022)**

Preparing Activity: USACE	**Superseding** **UFGS-35 20 14 (April 2008)**

UNIFIED FACILITIES GUIDE SPECIFICATIONS

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SECTION 35 20 14

STOPLOGS

08/22

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NOTE: This guide specification covers the requirements for fabricating, assembling, delivering, and installing stoplogs. This section was originally developed for USACE Civil Works projects.

Certain components of a Stoplog may be considered fracture critical. AWS D1.1 does not include provisions for fracture critical welding. The Designer should consider using guide specification SECTION 05 59 20 FABRICATION OF HYDRAULIC STEEL STRUCTURES for specifying fracture-critical welding utilizing a Fracture Control Plan. A Fracture Control Plan and the use of appropriate materials and welding is required by ER 1110-2-8157, "Responsibility for Hydraulic Steel Structures."

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

****

PART 1 GENERAL

1.1 UNIT PRICES

****
NOTE: If Section 01 20 00 PRICE AND PAYMENT PROCEDURES is included in the project specifications, this paragraph title (UNIT PRICES) should be deleted from this section and the remaining appropriately edited subparagraphs below should be inserted into Section 01 20 00.

Select Alternate 1 (one pay item) or Alternate 2 (two pay items). Delete all paragraphs of Alternate not selected.
****

1.1.1 Furnishing and Installing Stop Logs

****
NOTE: Alternate 1.
****

1.1.1.1 Payment

Payment is made for costs associated with furnishing and installing stop logs and appurtenant items, which includes full compensation for the materials, fabrication, delivery, installation, and testing of stop logs and appurtenant items necessary for complete installation.

1.1.1.2 Unit of Measure

Unit of measure: lump sum.

1.1.2 Furnishing Stop Logs

****
NOTE: Alternate 2.
****

1.1.2.1 Payment

Payment is made for costs associated with furnishing stop logs and appurtenant items, which includes full compensation for the materials, fabrication, and delivery of stop logs and appurtenant items necessary for complete installation.

1.1.2.2 Unit of Measure

Unit of Measure: lump sum.

1.1.3 Installing Stop Logs

****
NOTE: Alternate 2.
****

1.1.3.1 Payment

Payment is made for costs associated with the installation of stop logs and appurtenant items, which includes full compensation for the complete installation and testing of stop logs and appurtenant items.

1.1.3.2 Unit of Measure

Unit of measure: lump sum.

1.2 REFERENCES

****

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

****

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

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2020; Errata 1 2021) Structural Welding Code - Steel
AWS D1.2/D1.2M	(2014; Errata 1 2014; Errata 2 2020) Structural Welding Code - Aluminum

ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M	(2019) Standard Specification for Carbon Structural Steel
ASTM A242/A242M	(2013; R 2018) Standard Specification for High-Strength Low-Alloy Structural Steel
ASTM A307	(2021) Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
ASTM A320/A320M	(2022a) Standard Specification for Alloy-Steel and Stainless Steel Bolting

	for Low-Temperature Service
ASTM A529/A529M	(2019) Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality
ASTM A572/A572M	(2021; E 2021) Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM A588/A588M	(2019) Standard Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance
ASTM A709/A709M	(2021) Standard Specification for Structural Steel for Bridges
ASTM A992/A992M	(2022) Standard Specification for Structural Steel Shapes
ASTM B221	(2021) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B308/B308M	(2010; R 2020) Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles
ASTM D395	(2016; E 2017) Standard Test Methods for Rubber Property - Compression Set
ASTM D412	(2016; R 2021) Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension
ASTM D413	(1998; R 2017) Standard Test Methods for Rubber Property - Adhesion to Flexible Substrate
ASTM D471	(2016a) Standard Test Method for Rubber Property - Effect of Liquids
ASTM D572	(2004; R 2019) Rubber Deterioration by Heat and Oxygen
ASTM D2240	(2015; E 2017) Standard Test Method for Rubber Property - Durometer Hardness
ASTM F3125/F3125M	(2019) Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength

1.3 SUBMITTALS

****

NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

****

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Fabrication Drawings; G[, [_____]]

Shop Assembly Drawings; G[, [_____]]

Delivery Drawings; G[, [_____]]

Field Installation Drawings; G[, [_____]]

Stress Relieving Plan; G[, [_____]]

Fracture Control Plan (FCP); G[, [_____]]

Handling Attachments And Pick Points; G[, [_____]]

SD-03 Product Data

Sequencing and Scheduling; G[, [_____]]

Materials

Identification System

SD-06 Test Reports

Tests, Inspections, and Verifications

1.4 QUALITY ASSURANCE

1.4.1 Qualification of Welders and Welding Operators

Provide qualification of welders and welding operators conforming to the requirements of Section 05 50 14 STRUCTURAL METAL FABRICATIONS.

1.5 DELIVERY, STORAGE, AND HANDLING

Perform delivery, handling, and storage of materials and fabricated items in accordance with the requirements specified [herein and] in Section 05 50 14 STRUCTURAL METAL FABRICATIONS. [Unload material and equipment delivered to the site as approved by the Contracting Officer. Verify the condition and quantity of the items delivered and acknowledge receipt and condition thereof in writing to the Contracting Officer. If delivered items are damaged or a shortage is determined, notify the Contracting Officer of such in writing within 24 hours after delivery.]

1.5.1 Rubber Seals

Store rubber seals in a place which permits free circulation of air, maintains a temperature of 20 degrees C 70 degrees F or less, and prevents the rubber from being exposed to the direct rays of the sun. Keep rubber seals free of oils, grease, and other materials which would deteriorate the rubber. Do not distort rubber seals during handling.

1.5.2 Identification System

Submit an Identification System which shows the disposition of specific lots of approved materials and fabricated items in the work, before completion of the contract.

[1.6 SEQUENCING AND SCHEDULING

****
NOTE: The name of the appropriate railroad company or roadway agency should be inserted as indicated.
****

Before the work is commenced, submit the approved sequencing and scheduling plan which illustrates that work affecting [railroads] [roadways] has been coordinated with [_____]. Include schedules, lists of labor or materials to be provided to the affected [company] [agency], and any other aspects of the work that may impact on the operations of these

entities. Clearly demonstrate how all [railroad tracks] [public or private roads, streets, or highways] will be kept open to traffic at all times during the construction period, except as otherwise specified or directed.

]PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

2.1.1 Design Requirements

Submit detail drawings, including fabrication drawings, shop assembly drawings, delivery drawings, and field installation drawings, conforming to the requirements specified herein and in Section 05 50 14 STRUCTURAL METAL FABRICATIONS.

2.1.1.1 Fabrication Drawings

Show on the fabrication drawings complete details of materials, tolerances, connections, and proposed welding sequences which clearly differentiate shop welds and field welds.

2.1.1.2 Shop Assembly Drawings

Show on the shop assembly drawings details for connecting the adjoining fabricated components in the shop to assure satisfactory field installation.

2.1.1.3 Delivery Drawings

Show on the delivery drawings descriptions of methods of delivering components to the site, including details for supporting fabricated components during shipping to prevent distortion or other damages.

2.1.1.4 Field Installation Drawings

Show on the field installation drawings a detailed description of the field installation procedures. Include in the description the location and method of support of installation and handling equipment; provisions to be taken to protect concrete and other work during installation; method of maintaining components in correct alignment; plan for prestressing gate leaf diagonals, including descriptions of connections, riggings, anchorages, and measuring equipment; methods for installing quoin and miter blocks, including checking and maintaining alignments of the blocks during concreting and placement of [epoxy] [zinc] filler; [procedures and equipment used for heating and placing of the zinc filler;] and methods for installing other appurtenant items.

2.2 MATERIALS

Submit system of identification which shows the disposition of specific lots of approved materials and fabricated items in the work, before completion of the contract. Ensure materials orders, materials lists and materials shipping bills conform to the requirements of Section 05 50 14 STRUCTURAL METAL FABRICATIONS. Submit approved samples prior to use of the represented materials or items in the work. Submit samples of standard and shop fabricated items that are both full size and complete as required for installation in the work. Approved samples may be installed in the work provided each sample is clearly identified and its location

recorded.

2.2.1 Metals

****
NOTE: Consider the use of ASTM A709/A709M steel for fabrication of all steel components. A709 material is available in 36 ksi and 50 ksi and provides improved toughness and maximum yield to tensile ratios to ensure ductile performance.
****

Ensure structural steel, steel forgings, steel castings, stainless steel, bronze, aluminum bronze and other metal materials used for fabrication conform to the requirements shown and specified herein and in Section 05 50 15 CIVIL WORKS FABRICATIONS.

2.2.1.1 Structural Steel

Conform to [ASTM A36/A36M][ASTM A572/A572M][ASTM A992/A992M][ASTM A709/A709M].

2.2.1.2 Structural Aluminum

Conform to [ASTM B221] [ASTM B308/B308M] [Alloy 6061, Temper T6].

2.2.2 Rubber Seals

Provide rubber seals that are [fluorocarbon (Teflon) clad rubber seals of the mold type only, and] compounded of natural rubber, synthetic polyisoprene, or a blend of both, and contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents, and plasticizers.

2.2.2.1 Physical Characteristics

Ensure seals exhibit physical characteristics that meet the following requirements:

PHYSICAL TEST	TEST VALUE	TEST METHOD SPECIFICATION
Tensile Strength	20.7 MPa3,000 psi (min.)	ASTM D412
Elongation at Break	500 percent (min.)	ASTM D412
300 percent Modulus	6.9 MPa1,000 psi (min.)	ASTM D412
Durometer Hardness (Shore Type A)	60 to 70	ASTM D2240
*Water Absorption	5 percent by weight (max.)	ASTM D471
Compression Set	30 percent (max.)	ASTM D395, Method B
Tensile Strength (after aging 48 hrs)	80 percent tensile strength (min.)	ASTM D572

Perform the "Water Absorption" test using distilled water. Blot the

washed specimen dry with filter paper or other absorbent material and suspended by means of small glass rods in the oven at a temperature of 70 degrees C plus or minus 2 degrees for 22 plus or minus 1/4 hour. Remove the specimen and allow to air cool to room temperature, and weigh the specimen. Record the weight the nearest 1 mg as M subscript 1 (M subscript 1 is defined in ASTM D471). Ensure the immersion temperature is 70 degrees C plus or minus 1 degree and the immersion duration is at least 166 hours.

[2.2.2.2 Fabrication of Rubber Seals

Provide rubber seals with a fluorocarbon film that is vulcanized and bonded to the sealing surface of the bulb. Ensure the film thickness is [0.762] [1.524] mm [0.030] [0.060] inch and is Huntington Abrasion Resistant Fluorocarbon Film No. 4508, or equal, and has the following physical properties:

Tensile strength	13.8 MPa2,000 psi (min.)
Elongation	250 percent (min.)

Flush the outside surface of the bonded film with the surface of the rubber seal and ensure it is free of adhering or bonded rubber. Mold strips and corner seals in lengths suitable for obtaining the finish lengths shown and with sufficient excess length to provide test specimens for testing the adequacy of the adhesion bond between the film and bulb of the seal. At one end of each strip or corner seal to be tested, mask the fluorocarbon film during bonding to prevent a bond for a length sufficient to hold the film securely during testing.

]2.3 MANUFACTURED UNITS

Ensure bolts, nuts, washers, screws and other manufactured units conform with the requirements shown and specified herein and in Section 05 50 15 CIVIL WORKS FABRICATIONS.

2.3.1 Bolts, Nuts and Washers

Ensure high-strength bolts, nuts, and washers conform to ASTM F3125/F3125M, Grade A325, [hot-dip galvanized]. Ensure bolts, nuts, studs, stud bolts and bolting materials other than high-strength conform to ASTM A307, Grade A, [hot-dip galvanized] or ASTM A320/A320M, [Ferritic Steel, Grade [_____]] [Austenitic Steel, Grade [_____], Class [_____]]. Use bolts M16 1/2 inch and larger that have hexagon heads. Ensure the finished shank of bolts is long enough to provide full bearing. Use washer with bolts that conform to the requirements specified in the applicable specification for bolts.

2.3.2 Screws

Provide screws of the type indicated on the drawings.

2.4 FABRICATION

2.4.1 Structural Fabrication

Ensure all structural fabrications conform with the requirements shown and specified herein and in Section 05 50 14 STRUCTURAL METAL FABRICATIONS.

Shop-fabricated of the materials specified and shown. Ensure dimensional tolerances comply with the specifications and as shown on the drawings. Splices are only allowed where shown or approved. Bore pin holes in components after welding, straightening, stress-relieving, and threading operations are completed. Brackets, eye bar sections, and other components requiring straightening are only to be straightened by methods which do not damage the material. Press-fit bronze bushings with supporting components. Provide bolt connections, lugs, clips, or other pick-up assembly devices for components as shown and required for proper assembly and installation. Make provisions for the installation of [cathodic protection system devices and other] appurtenances as required.

2.4.2 Welding

****

NOTE: List applicable welds requiring radiographic examination.

NOTE: Specification Section 05 50 14 STRUCTURAL METAL FABRICATIONS includes welds subjected to Ultrasonic Testing (UT), Dye Penetrant Testing (PT) and Magnetic Testing (MT). AWS D1.1 does not specify nondestructive testing of any completed weld. Designer must take this into account and specify any Nondestructive Testing (NDT) requirements as well as specifying which welds are to be subjected to nondestructive testing.

The designer is to consider whether any components included are likely to be fracture critical. Fracture critical components should be identified as requiring fabrication in accordance with a Fracture Control Plan.

****

Ensure welding conforms to the requirements of AWS D1.1/D1.1M, AWS D1.2/D1.2M, the requirements specified herein and in Section 05 50 14 STRUCTURAL METAL FABRICATIONS. Provide welds of the types shown on the contract drawings and approved detail drawings. Radiographic examination is required on the major shop and field welds of the type and location indicated on the drawings and as follows: [_____]. Welds which have been designated to receive radiographic examination and are found to be inaccessible to a radiation source or film, or are otherwise so situated that radiographic examination is not feasible may be examined, with written approval, by dye penetrant, magnetic particle tests, or ultrasonic tests. All components are to be stress-relief heat treated after welding where shown. Perform stress-relieving of components prior to the attachment of miscellaneous appurtenances. Submit a Stress Relieving Plan for approval which follows the minimum requirements for thermal stress relief in accordance with AWS D1.1.[Stress-relief heat treat all components after welding where shown. Perform stress-relieving of components prior to the attachment of miscellaneous appurtenances.][Refer to Specification SECTION 05 50 14 STRUCTURAL METAL FABRICATIONS for nondestructive testing requirements.][Submit a Fracture Control Plan (FCP) for fracture critical components.]

2.4.3 Bolted Connections

Ensure bolted connections conforms to the requirements specified in

Section 05 50 14 STRUCTURAL METAL FABRICATIONS.

2.4.4 Machine Work

Ensure machine work conforms to the requirements specified in Section 05 50 14 STRUCTURAL METAL FABRICATIONS.

2.4.5 Miscellaneous Provisions

Ensure miscellaneous provisions for fabrication conforms to the requirements specified herein and in Section 05 50 14 STRUCTURAL METAL FABRICATIONS.

2.4.6 Fabrications

2.4.6.1 Stoplogs [and Posts]

****

NOTE: Fabricate stoplogs and posts of structural steel or aluminum. Where aluminum is specified, include the requirements for aluminum stoplogs and posts to be furnished by the Contractor, or aluminum materials and extrusion dies for fabricating stoplogs and posts to be furnished by the Government to the Contractor for fabricating aluminum stoplogs and posts if such is the practice in the Command.

****

Fabricate [stoplogs [and posts] of [structural steel conforming to [ASTM A36/A36M] [ASTM A242/A242M] [ASTM A529/A529M] [ASTM A572/A572M, Grade [42,] [50,] [60,] [or] [65]] [ASTM A588/A588M]] [extruded aluminum conforming to [ASTM B221,] [ASTM B308/B308M,] [Alloy 6061, Temper T6]].] [Galvanized steel items where indicated.] Fabricate [stoplogs [and posts] with the aluminum materials and extrusion dies provided to the Contractor by the Contracting Officer. Furnish all other materials and equipment as required for fabrication.]

2.4.6.2 Stoplog Guides [and Post Pockets]

Fabricate stoplog guides [and post pockets] of structural steel conforming to [ASTM A36/A36M] [ASTM A242/A242M] [ASTM A529/A529M] [ASTM A572/A572M, Grade [42,] [50,] [60,] [or] [65]] [ASTM A588/A588M].

2.4.6.3 Miscellaneous Embedded Metals

Ensure corner protection angles, frames, base plates, and other embedded metal items required for complete installation conform to the details shown.

2.4.6.4 Seal Assemblies

Provide seal assemblies consisting of rubber seals, stainless steel retainer and spacer bars, and fasteners. Provide rubber that continuous over the full length. Accurately fit and drill all seals for proper installation. Drill bolt holes in the rubber seals by using prepared templates or the retainer bars as templates. Fully mold splices in seals and develop a minimum tensile strength of 50 percent of the unspliced seal strength. Place splices only at shown locations. Shop vulcanize all splices. Locate vulcanized splices between molded corners and straight

lengths as close to the corners as practicable. Place splices on a 45 degree bevel related to the "thickness" of the seal. Ensure all finished splice surfaces are smooth and free of irregularities. Field-splice stainless steel retainer bars only where shown and machine-finished after splicing.

2.4.6.5 Appurtenant Items

Sill assemblies, latches, bumpers fenders, seal plates and shapes, and other appurtenant items per the details specified and shown.

2.4.6.6 Shop Assembly

Shop assembly requirements for miter gates and appurtenant items are shown and specified herein and in Section 05 50 14 STRUCTURAL METAL FABRICATIONS. Completely shop assemble miter gates and appurtenant items, unless otherwise approved by the Contracting Officer, to assure satisfactory field installation. Fit and bolt adjoining components together to facilitate field connections. Carefully preserve the match-marking of unassembled items until the items are assembled. Cover mating surfaces and machined surfaces with a rust preventative until assembly. Shop-welded assembled components in their final positions as much as delivery and field installation conditions permit. Fit and drill rubber seals to match the seal retainers, match-marked, and removed for shipment. Perform shop assembly and disassembly work in the presence of the Contracting Officer unless otherwise approved by the Contracting Officer; however, the presence of the Contracting Officer does not relieve the Contractor of any responsibility under this contract.

2.5 TESTS, INSPECTIONS, AND VERIFICATIONS

Submit certified test reports for material tests with all materials delivered to the site.

2.5.1 General

Perform tests, Inspections, and Verifications for materials the requirements specified herein and in Section 05 50 14 STRUCTURAL METAL FABRICATIONS.

2.5.2 Testing of Rubber Seals

Test the fluorocarbon film of rubber seals for adhesion bond in accordance with ASTM D413 using either the machine method or the deadweight method. Cut a 25 mm 1 inch long piece of seal from the end of the seal which has been masked and subjected to tension at an angle approximately 90 degrees to the rubber surface. Ensure there is no separation between the fluorocarbon film and the rubber when subjected to the following loads:

THICKNESS OF FLUOROCARBON FILM	MACHINE METHOD AT 50 MM2 INCHES PER MINUTE	DEADWEIGHT METHOD
0.762 mm0.030 inch	13.6 kg per 25 mm30 pounds per inch width	13.6 kg per 25 mm30 pounds per inch width
1.524 mm0.060 inch	13.6 kg per 25 mm30 pounds per inch width	13.6 kg per 25 mm30 pounds per inch width

PART 3 EXECUTION

3.1 INSTALLATION

Installation per the requirements specified herein and in Section 05 50 14 STRUCTURAL METAL FABRICATIONS. Assemble miter gates and appurtenant items for installation in strict accordance with the contract drawings, approved installation drawings, and shop match-markings. Thoroughly clean and lubricate bearing surfaces requiring lubrication with an approved lubricant before assembly and installation. Ensure components to be field-welded are placed in correct alignment before welding is commenced. Design and submit handling attachments and pick points required to be added to any specified items herein prior to installation.

3.1.1 Embedded Metals

Accurately install sill assemblies, seal plates, frames, bases and other embedded metal items required for proper and complete installation to the alignment and grade required to ensure accurate fitting and matching of components. Primer coat all embedded metals with the required paint on all surfaces prior to installation in concrete forms. Install anchors for embedded metals as shown. Attach items requiring two concrete pours for installation to the embedded anchors after the initial pour, adjusted to the proper alignment, and concreted in place with the second pour. Grind smooth welded field splices in sealing surfaces of embedded items.

3.1.2 Painting

Paint all exposed parts of gates and appurtenances except machined surfaces, corrosion-resistant surfaces, surfaces of anchorages embedded in concrete, [cathodic protection system anodes,] and other specified surfaces as specified in Section 09 97 02 PAINTING: HYDRAULIC STRUCTURES.

3.1.3 Seal Assemblies

Install rubber seal assemblies after the embedded metal components have been concreted in place and the gate installation, including painting, completed. Securely fasten rubber seals to metal retainers. Before operating the gate(s), apply a suitable lubricant to the rubber seal rubbing plates to protect the rubber.

3.2 FIELD QUALITY CONTROL

Non-Destructive testing of field welds is required to meet the same quality control requirements as shop-welded components.

3.3 SYSTEM START-UP

3.3.1 Trial Operation

After completion of the gate installation, conduct an examination of the gates in the presence of the Contracting Officer for final acceptance. First examine the gates to determine whether or not the workmanship conforms to the specification requirements. Operate the gates from the fully-opened to the fully-closed position a sufficient number of times to demonstrate to the Contracting Officer's satisfaction that all parts are functioning properly. The workmanship in the fabrication and installation of gates is the result in a condition where when the gates are in the closed position watertight barrier is formed across the opening. The

contractor is required to make all repairs or replacements to correct defects, as determined by the Contracting Officer, at no cost to the Government. Repeat the trial operation after defects are corrected. Prior to final acceptance of the gates, provide temporary restraints to prevent unauthorized operation of the gates.

3.4 PROTECTION

Protect finished work per the requirements of Section 05 50 14 STRUCTURAL METAL FABRICATIONS.

-- End of Section --