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USACE / NAVFAC / AFCEA UFGS-05615 (August 2004)  
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Preparing Activity: USACE (CW) Superseding  
UFGS-05615A (December 2003)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated 25 June 2004

Latest change indicated by CHG tags

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##### SECTION 05615

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08/04

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### SECTION 05615

#### STOPLOGS 08/04

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NOTE: This guide specification covers the requirements for fabricating, assembling, delivering, and installing stoplogs.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

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## PART 1 GENERAL

### 1.1 REFERENCES

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NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest guide specification. Use of SpecsIntact automated reference checking is recommended for projects based on older guide specifications.

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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.

ASTM INTERNATIONAL (ASTM)

ASTM A 153/A 153M	(2003) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 242/A 242M	(2003a) High-Strength Low-Alloy Structural Steel
ASTM A 307	(2002) Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
ASTM A 320/A 320M	(2003) Alloy/Steel Bolting Materials for Low-Temperature Service
ASTM A 325	(2002) Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A 325M	(2003) Structural Bolts, Steel, Heat Treated, 830 Mpa Minimum Tensile Strength (Metric)
ASTM A 36/A 36M	(2003a) Carbon Structural Steel
ASTM A 490	(2002) Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
ASTM A 490M	(2003) High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric)
ASTM A 529/A 529M	(2003) High-Strength Carbon-Manganese Steel of Structural Quality
ASTM A 572/A 572M	(2003a) High-Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM A 588/A 588M	(2003) High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4 in. (100 mm) Thick
ASTM B 221	(2002) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B 221M	(2002) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
ASTM B 308/B 308M	(2002) Aluminum-Alloy 6061-T6 Standard Structural Profiles
ASTM D 2240	(2003) Rubber Property - Durometer Hardness
ASTM D 395	(2003) Rubber Property - Compression Set
ASTM D 412	(1998a; R 2002e1) Vulcanized Rubber and Thermoplastic Elastomers - Tension

ASTM D 413	(1998; R 2002e1) Rubber Property - Adhesion to Flexible Substrate
ASTM D 471	(1998e1) Rubber Property - Effect of Liquids
ASTM D 572	(1999) Rubber Deterioration by Heat and Oxygen

## 1.2 LUMP SUM PRICES

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NOTE: If Section 01270A MEASUREMENT AND PAYMENT is included in the project specifications, this paragraph title (LUMP SUM PRICES) should be deleted from this section and the remaining appropriately edited subparagraphs below should be inserted into Section 01270A.

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### 1.2.1 Stoplogs

#### 1.2.1.1 Payment

Payment shall constitute full compensation for furnishing all plant, labor, materials and equipment and performing all operations necessary for installing the stoplogs as specified.

#### 1.2.1.2 Unit of Measure

Unit of measure: lump sum.

## 1.3 SUBMITTALS

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NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation 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 projects.

Submittal items not designated with a "G" are considered as being for information only for Army projects and for Contractor Quality Control approval for Navy projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.] [for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

#### SD-02 Shop Drawings

Detail Drawings[; G][; G, [\_\_\_\_]]

Detail drawings shall be submitted as specified in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS.

#### SD-03 Product Data

[Sequencing and Scheduling[; G][; G, [\_\_\_\_]]

Sequencing and scheduling plan shall be submitted and approved before the work is commenced.]

#### Welding

Schedules of welding procedures for structural steel [and welding processes for aluminum] shall be submitted as specified in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS.

#### Materials

Materials orders, materials lists and materials shipping bills shall be submitted as specified in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS.

#### Identification System

A system of identification for disposition of materials.

#### SD-06 Test Reports

##### Tests, Inspections, and Verifications

Certified test reports for material tests shall be submitted with all materials delivered to the site.

#### 1.4 QUALIFICATION OF WELDERS AND WELDING OPERATORS

Qualification of welders and welding operators shall conform to the requirements of Section 05055A METALWORK FABRICATION, MACHINE WORK,

MISCELLANEOUS PROVISIONS.

1.5 DELIVERY, STORAGE AND HANDLING

Delivery, handling and storage of materials and fabricated items shall conform to the requirements specified [herein and] in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS. [Materials and equipment delivered to the site by the Contracting Officer shall be unloaded by the Contractor. The Contractor shall verify the condition and quantity of the items delivered by the Contracting Officer and acknowledge receipt and condition thereof in writing to the Contracting Officer. If delivered items are damaged or a shortage is determined, the Contractor shall notify the Contracting Officer of such in writing within 24 hours after delivery.]

1.5.1 Rubber Seals

Rubber seals shall be stored 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. Rubber seals shall be kept free of oils, grease, and other materials which would deteriorate the rubber. Rubber seals shall not be distorted during handling.

1.5.2 Identification System

The Contractor shall 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

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**NOTE: The name of the appropriate railroad company  
or roadway agency should be inserted as indicated.**  
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Develop a sequencing and scheduling plan which illustrates that work affecting [railroads] [roadways] has been coordinated with [\_\_\_\_\_]. The plan shall 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 as specified in Section [\_\_\_\_\_]. The plan shall 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. Refer to Section [\_\_\_\_\_] for other requirements such as warning signs, flagmen, permits, and debris removal.]

PART 2 PRODUCTS

2.1 MATERIALS

Materials orders, materials lists and materials shipping bills shall conform to the requirements of Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS.

2.1.1 Metals

Structural steel [, structural aluminum,] and other metal materials

sections and standard articles shall be as shown and as specified herein and in Section 05502A METALS: MISCELLANEOUS, STANDARD ARTICLES, SHOP FABRICATED ITEMS.

#### 2.1.1.1 Structural Steel

Structural steel shall conform to [ASTM A 36/A 36M] [ASTM A 242/A 242M] [ASTM A 529/A 529M] [ASTM A 572/A 572M, Grade [42,] [50,] [60,] [or] [65]] [ASTM A 588/A 588M].

#### 2.1.1.2 [Structural Aluminum

Structural aluminum shall conform to [ASTM B 221M ASTM B 221,] [ASTM B 308/B 308M,] [Alloy 6061, Temper T6].]

#### 2.1.2 Rubber Seals

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**NOTE: If fluorocarbon (Teflon) clad seals are not used, omit paragraphs FABRICATION and ZINC FILLER.**  
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#### 2.1.2.1 General Requirements

Rubber seals shall be [fluorocarbon (Teflon) clad rubber seals of the mold type only, shall be] compounded of natural rubber, synthetic polyisoprene, or a blend of both, and shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents, and plasticizers. Physical characteristics of the seals shall meet the following requirements:

PHYSICAL TEST	TEST VALUE	TEST METHOD SPECIFICATION
Tensile Strength	17.2 MPa (min.)	ASTM D 412
Elongation at Break	450% (min.)	ASTM D 412
300% Modulus	6.2 MPa (min.)	ASTM D 412
Durometer Hardness (Shore Type A)	60 to 70	ASTM D 2240
*Water Absorption	5% by weight (max.)	ASTM D 471
Compression Set	30% (max.)	ASTM D 395
Tensile Strength (after aging 48 hrs)	803500f tensile strength (min.)	ASTM D 572
PHYSICAL TEST	TEST VALUE	TEST METHOD SPECIFICATION
Tensile Strength	2,500 psi (min.)	ASTM D 412
Elongation at Break	450% (min.)	ASTM D 412
300% Modulus	900 psi (min.)	ASTM D 412
Durometer Hardness	60 to 70	ASTM D 2240

PHYSICAL TEST	TEST VALUE	TEST METHOD SPECIFICATION
(Shore Type A)		
*Water Absorption	5% by weight (max.)	ASTM D 471
Compression Set	30% (max.)	ASTM D 395
Tensile Strength (after aging 48 hrs)	803500f tensile strength (min.)	ASTM D 572

The "Water Absorption" test shall be performed with distilled water. The washed specimen shall be blotted 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 plus/minus 2 degrees C for 22 plus/minus 1/4 hour. The specimen shall be removed, allowed to cool to room temperature in air, and weighed. The weight shall be recorded to the nearest 1 mg as W1 (W1 is defined in ASTM D 471). The immersion temperature shall be 70 degrees plus/minus 1 degree C and the duration of immersion shall be 166 hours.

#### 2.1.2.2 [Fabrication]

Rubber seals shall have a fluorocarbon film vulcanized and bonded to the sealing surface of the bulb. The film shall be [0.762] [1.524] mm [0.030] [0.060] inch thick Huntington Abrasion Resistant Fluorocarbon Film No. 4508, or equal, and shall have the following physical properties:

Tensile strength ..... 13.8 MPa (min.)  
Elongation ..... 250 percent (min.)  
Tensile strength ..... 2,000 psi (min.)  
Elongation ..... 250 percent (min.)

The outside surface of the bonded film shall be flush with the surface of the rubber seal and shall be free of adhering or bonded rubber. Strips and corner seals shall be molded 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, the fluorocarbon film shall be masked during bonding to prevent a bond for a length sufficient to hold the film securely during testing.]

## 2.2 MANUFACTURED UNITS

Bolts, nuts, washers, screws and other manufactured units shall conform to the requirements specified and in Section 05502A METALS: MISCELLANEOUS, STANDARD ARTICLES, SHOP FABRICATED ITEMS.

### 2.2.1 Bolts, Nuts and Washers

[High-strength bolts, nuts, and washers shall conform to [ASTM A 325M ASTM A 325,] Type [\_\_\_\_], [hot-dip galvanized] or [ASTM A 490M ASTM A 490,] Type [\_\_\_\_].] [Bolts, nuts, studs, stud bolts and bolting materials other than high-strength shall conform to ASTM A 307, Grade A, [hot-dip galvanized] or ASTM A 320/A 320M, [Ferritic Steel, Grade [\_\_\_\_]]

[Austenitic Steel, Grade [\_\_\_\_], Class [\_\_\_\_]].] Bolts 13 mm 1/2 inch and larger shall have hexagon heads. The finished shank of bolts shall be long enough to provide full bearing. Washers for use with bolts shall conform to the requirements specified in the applicable specification for bolts.

#### 2.2.2 Screws

Screws shall be of the type indicated.

#### 2.2.3 [Clips and Clip Bolts for [Aluminum] [Steel] Panels

Clips and clip bolts for [aluminum] [steel] panels shall be approved standard manufactured stock items.]

### 2.3 FABRICATION

#### 2.3.1 Detail Drawings

Detail drawings of stoplogs and appurtenant shop fabricated items, including fabrication drawings, shop assembly drawings, delivery drawings, and field installation drawings, shall conform to the requirements specified and in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS.

##### 2.3.1.1 Fabrication Drawings

Fabrication drawings shall show complete details of materials, tolerances, connections, and proposed welding sequences which clearly differentiate shop welds and field welds.

##### 2.3.1.2 Shop Assembly Drawings

Shop assembly drawings shall provide details for connecting the adjoining fabricated components in the shop to assure satisfactory field installation.

##### 2.3.1.3 Delivery Drawings

Delivery drawings shall provide descriptions of methods of delivering components to the site, including details for supporting fabricated components during shipping to prevent distortion or other damages.

##### 2.3.1.4 Field Installation Drawings

Field installation drawings shall provide a detailed description of the field installation procedures. The description shall include 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; and methods for installing appurtenant items.

#### 2.3.2 Structural Fabrication

Structural fabrication shall conform to the requirements specified and in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS.

### 2.3.3 Welding

Welding shall conform to the requirements specified in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS.

### 2.3.4 Bolted Connections

Bolted connections shall conform to the requirements specified in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS.

### 2.3.5 Machine Work

Machine work shall conform to the requirements specified in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS.

### 2.3.6 Miscellaneous Provisions

Miscellaneous provisions for fabrication shall conform to the requirements specified and in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS. [Zinc coating of hardware items shall conform to ASTM A 153/A 153M.]

### 2.3.7 Fabrications

#### 2.3.7.1 Stoplogs [and Posts]

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NOTE: Stoplogs and posts shall be fabricated 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.

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[Stoplogs [and posts] shall be fabricated of [structural steel conforming to [ASTM A 36/A 36M] [ASTM A 242/A 242M] [ASTM A 529/A 529M] [ASTM A 572/A 572M, Grade [42,] [50,] [60,] [or] [65]] [ASTM A 588/A 588M]] [extruded aluminum conforming to [ASTM B 221M ASTM B 221,] [ASTM B 308/B 308M,] [Alloy 6061, Temper T6]].] [Steel items shall be galvanized where indicated.] [Stoplogs [and posts] shall be fabricated with the aluminum materials and extrusion dies provided to the Contractor by the Contracting Officer. The Contractor shall furnish all other materials and equipment as required for fabrication.]

#### 2.3.7.2 Stoplog Guides [and Post Pockets]

Stoplog guides [and post pockets] shall be fabricated of structural steel conforming to [ASTM A 36/A 36M] [ASTM A 242/A 242M] [ASTM A 529/A 529M] [ASTM A 572/A 572M, Grade [42,] [50,] [60,] [or] [65]] [ASTM A 588/A 588M].

#### 2.3.7.3 Miscellaneous Embedded Metals

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

### 2.3.8 Seal Assemblies

Seal assemblies shall consist of rubber seals, stainless steel retainer and spacer bars, and fasteners. Rubber seals shall be continuous over the full length. Seals shall be accurately fitted and drilled for proper installation. Bolt holes shall be drilled in the rubber seals by using prepared templates or the retainer bars as templates. Splices in seals shall be fully molded, develop a minimum tensile strength of 50 percent of the unspliced seal, and occur only at locations shown. All vulcanizing of splices shall be done in the shop. The vulcanized splices between molded corners and straight lengths shall be located as close to the corners as practicable. Splices shall be on a 45 degree bevel related to the "thickness" of the seal. The surfaces of finished splices shall be smooth and free of irregularities. Stainless steel retainer bars shall be field-spliced only where shown and machine-finished after splicing.

## 2.4 TESTS, INSPECTIONS, AND VERIFICATIONS

### 2.4.1 General

Tests, inspections, and verifications for materials shall conform to the requirements specified in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS.

### 2.4.2 [Testing of Rubber Seals

The fluorocarbon film of rubber seals shall be tested for adhesion bond in accordance with ASTM D 413 using either the machine method or the deadweight method. A 25 mm 1 inch long piece of seal shall be cut from the end of the seal which has been masked and subjected to tension at an angle approximately 90 degrees to the rubber surface. There shall be no separation between the fluorocarbon film and the rubber when subjected to the following loads:

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**NOTE: The following tolerances are in SI.**

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THICKNESS OF FLUOROCARBON FILM	MACHINE METHOD AT 50 MM PER MINUTE	DEADWEIGHT METHOD
[0.762 mm	13.6 kg per 25 mm width	13.6 kg per 25 mm width]
[1.524 mm	13.6 kg per 25 mm width	13.6 kg per 25 mm width]

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**NOTE: The following tolerances are in IP.**

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THICKNESS OF FLUOROCARBON FILM	MACHINE METHOD AT 2 INCHES PER MINUTE	DEADWEIGHT METHOD
[0.030 inch	30 pounds per inch width	30 pounds per inch width]

THICKNESS OF FLUOROCARBON FILM	MACHINE METHOD AT 2 INCHES PER MINUTE	DEADWEIGHT METHOD
[0.060 inch	30 pounds per inch width	30 pounds per inch width]

Failure of any specimen to meet the requirements of the test used will be cause for rejection of the piece from which the test specimen was taken.]

### PART 3 EXECUTION

#### 3.1 INSTALLATION

Installation shall conform to the requirements specified and in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS.

##### 3.1.1 Embedded Metals

Corner protection angles, frames, base plates, and other embedded metal items required for complete installation shall be accurately installed to the alignment and grade required to ensure accurate fitting and matching of components. Embedded metals shall be given a primer coat of the required paint on all surfaces prior to installation in concrete forms. Anchors for embedded metals shall be installed as shown. Items requiring two concrete pours for installation shall be attached to the embedded anchors after the initial pour, adjusted to the proper alignment, and concreted in place with the second pour.

##### 3.1.2 Seal Assemblies

Rubber seal assemblies shall be installed after the embedded metal components have been concreted in place and the gate installation, including painting, completed. Rubber seals shall be fastened securely to metal retainers. Before operating the gate[s], a suitable lubricant shall be applied to the rubber seal rubbing plates to protect the rubber.

##### 3.1.3 Painting

Exposed parts of stoplogs and appurtenances except machined surfaces, corrosion-resistant surfaces, surfaces of anchorages embedded in concrete, rubber seals, and other specified surfaces shall be painted as specified in Section 09964 PAINTING: HYDRAULIC STRUCTURES.

#### 3.2 PROTECTION OF FINISHED WORK

Protection of finished work shall conform to the requirements specified in Section 05055A METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS.

#### 3.3 ACCEPTANCE TRIAL OPERATION

After completion of installation, the Contracting Officer will examine the stoplog installation for final acceptance. The individual components of the stoplog installation will be examined first to determine whether or not the workmanship conforms to the specification requirements. The Contractor will be required to place the stoplogs [and posts] in the guides [and post pockets] a sufficient number of times to demonstrate that the stoplogs fit properly and seat uniformly. Required repairs or replacements to correct

defects, shall be made at no cost to the Government. The trial operation shall be repeated after defects are corrected.

-- End of Section --