

Preparing Activity: USACE

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated April 2010

\*\*\*\*\*

SECTION TABLE OF CONTENTS

DIVISION 05 - METALS

SECTION 05 59 10

ROLLING COVER FOR AVIATION REFUELING VAULTS

02/10

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 ADMINISTRATIVE REQUIREMENTS
- 1.3 SUBMITTALS
- 1.4 QUALITY ASSURANCE
  - 1.4.1 Welder Qualifications
  - 1.4.2 Workmanship
  - 1.4.3 Detail Drawings

PART 2 PRODUCTS

- 2.1 MATERIALS AND EQUIPMENT
  - 2.1.1 Bolts and Cap Screws
  - 2.1.2 Nuts
  - 2.1.3 Washers
  - 2.1.4 Tube Steel
  - 2.1.5 Structural Steel
  - 2.1.6 Rolling Cover Shell
    - 2.1.6.1 Aluminum
  - 2.1.7 Wheel Assemblies
    - 2.1.7.1 Wheels
    - 2.1.7.2 Axles
- 2.2 FABRICATION
  - 2.2.1 General
  - 2.2.2 Dimensional Tolerances
  - 2.2.3 Steel
  - 2.2.4 Aluminum
  - 2.2.5 Bolted Connections
    - 2.2.5.1 Bolted Steel Connections
    - 2.2.5.2 Bolted Aluminum Connections
- 2.3 MACHINE WORK
  - 2.3.1 Finished Surfaces
  - 2.3.2 Unfinished Surfaces
- 2.4 WELDING
  - 2.4.1 Welding of Structural Steel
  - 2.4.2 Welding of Aluminum

- 2.4.3 Welding Inspection
  - 2.4.3.1 Visual Examination
- 2.4.4 Steel Welding Repairs
- 2.5 MISCELLANEOUS PROVISIONS
  - 2.5.1 Metallic Coatings
  - 2.5.2 Cleaning of Stainless Steel
- 2.6 SHOP TESTING
  - 2.6.1 Wheel Assembly Testing
  - 2.6.2 Assembly Tests
- 2.7 PREPARATION FOR SHIPPING

PART 3 EXECUTION

- 3.1 ASSEMBLY
- 3.2 PROTECTION OF FINISHED WORK
  - 3.2.1 Lubrication After Assembly
  - 3.2.2 Aluminum
- 3.3 ACCEPTANCE TESTING

-- End of Section Table of Contents --

\*\*\*\*\*  
USACE / NAVFAC / AFCEA / NASA UFGS-05 59 10 (February 2010)  
-----

Preparing Activity: USACE

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated April 2010

\*\*\*\*\*

### SECTION 05 59 10

#### ROLLING COVER FOR AVIATION REFUELING VAULTS 02/10

\*\*\*\*\*

NOTE: This guide specification covers the requirements for custom fabricated rolling covers installed on new or existing aircraft refueling system vaults constructed to the requirements of the DoD Type III/IV/V, and Cut'n Cover Hydrant Refueling System Standards DoD Type III systems shall conform to Standard Design 078-24-28 PRESSURIZED HYDRANT FUELING SYSTEM (TYPE III). DoD Type IV/V systems shall conform to Standard Design 078-24-29 AIRCRAFT DIRECT FUELING SYSTEM (TYPE IV) DESIGN.

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

\*\*\*\*\*

#### PART 1 GENERAL

This specification covers the factory fabrication, assembly, testing, and shipping requirements for custom fabricated rolling covers having steel or aluminum shells as indicated in vault schedule on the vault drawings. Covers are to be field installed by other than the manufacturer on variously sized new and/or existing hydrant fueling system vaults and tanks.

##### 1.1 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 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 in the text by basic designation only.

ALUMINUM ASSOCIATION (AA)

AA ADM-105 (2005; Errata 2005) Aluminum Design Manual

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M (2008; Errata 2008) Structural Welding Code - Steel

AWS D1.2/D1.2M (2008) Structural Welding Code - Aluminum

ASME INTERNATIONAL (ASME)

ASME B4.1 (1967; R 2009) Preferred Limits and Fits for Cylindrical Parts

ASME B46.1 (2002) Surface Texture, Surface Roughness, Waviness and Lay

ASME BPVC SEC IX (2007; Addenda 2008; Addenda 2009) Boiler and Pressure Vessel Code; Section IX, Welding and Brazing Qualifications

ASTM INTERNATIONAL (ASTM)

ASTM A 123/A 123M (2009) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A 276 (2008a) Standard Specification for Stainless Steel Bars and Shapes

ASTM A 307 (2007b) Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

ASTM A 36/A 36M (2008) Standard Specification for Carbon Structural Steel

ASTM A 500/A 500M	(2009) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A 563	(2007a) Standard Specification for Carbon and Alloy Steel Nuts
ASTM B 209	(2007) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

## 1.2 ADMINISTRATIVE REQUIREMENTS

Submit manufacturer's catalogue cuts and dimensional sheets. Include a description of the item, materials of construction, and dimensions. Provide data sufficient to indicate compliance with specifications. Mark items pertaining to specifications with a heavy black arrow.

## 1.3 SUBMITTALS

\*\*\*\*\*

NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

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, Air Force, and NASA projects.

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" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.] [information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the

Government.] Submit the following in accordance with Section 01 33 00  
SUBMITTAL PROCEDURES:

#### SD-01 Preconstruction Submittals

Assembly Tests[; G][; G, [\_\_\_\_]]  
Acceptance Testing; G

#### SD-02 Shop Drawings

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

#### SD-03 Product Data

Wheel Assemblies[; G][; G, [\_\_\_\_]]  
Materials List[; G][; G, [\_\_\_\_]]  
Welding[; G][; G, [\_\_\_\_]]  
Welding of Aluminum[; G][; G, [\_\_\_\_]]  
Steel Welding Repairs[; G][; G, [\_\_\_\_]]

#### SD-07 Certificates

Welder Qualifications  
Welding of Aluminum

### 1.4 QUALITY ASSURANCE

#### 1.4.1 Welder Qualifications

Submit certification stating that the welders, welding operators and tack welders who will perform structural steel welding have been qualified for the particular type of work to be done in accordance with the requirements of AWS D1.1/D1.1M, Section 4, prior to commencing fabrication. The certificate shall list the qualified welders by name and shall specify the code and procedures under which qualified and the date of qualification. Prior qualification will be accepted if welders have performed satisfactory work under the code for which qualified within the preceding three months. Require welders to repeat the qualifying tests when their work indicates a reasonable doubt as to proficiency. Those passing the requalification tests will be recertified. Those not passing will be disqualified until passing. All expenses in connection with qualification and requalification shall be borne by the Contractor.

#### 1.4.2 Workmanship

Workmanship shall be of the highest grade and in accordance with the best modern practices to conform with the specifications for the item of work being furnished. Welding shall be continuous along the entire area of contact except where tack welding is permitted. Exposed connections 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.

#### 1.4.3 Detail Drawings

Submit detail drawings for metalwork and machine work prior to fabrication. With the detail drawings submit a materials list for fabricated items. Detail drawings for metalwork and machine work shall include catalog cuts, templates, fabrication and assembly details, and type, grade, and class of material as appropriate. Also include a sketch

showing final wheel to axle mounting (i.e., washers, nuts, spacers). Elements of fabricated items inadvertently omitted on contract drawings shall be detailed by the fabricator and indicated on the detail drawings. Drawings shall include all dimensional and tolerance data for each size of vault being fabricated.

## PART 2 PRODUCTS

### 2.1 MATERIALS AND EQUIPMENT

#### 2.1.1 Bolts and Cap Screws

All bolts shall be steel and shall conform to [ASTM A 307](#), Grade A, Hex.

#### 2.1.2 Nuts

Shall conform to [ASTM A 563](#), Grade A, Hex, and shall be of the same finish as the fasteners they are used with.

#### 2.1.3 Washers

Flat washers shall conform to the requirements of [ASTM A 276](#) (stainless steel).

#### 2.1.4 Tube Steel

Structural tubing shall conform to [ASTM A 500/A 500M](#), Grade B.

#### 2.1.5 Structural Steel

Carbon grade steel shall conform to [ASTM A 36/A 36M](#)

#### 2.1.6 Rolling Cover Shell

Cover shell material shall be as indicated on the drawings and specified as follows:

##### 2.1.6.1 Aluminum

Aluminum sheets and strips shall comply with [ASTM B 209](#), alloy and temper best suited for the purpose.

#### 2.1.7 Wheel Assemblies

##### 2.1.7.1 Wheels

Provide the heavy duty industrial type that is the product of a company regularly engaged in the production of wheels. The wheels shall have solid rubber tires that are molded onto spoked or solid centers that are either cast, forged, or machined. The rubber shall have a hardness rating of 80-90 Shore A durometer. Tires shall not stretch or work loose from the metal center. The wheels shall have roller bearings and shall be pressure lubricated from a grease fitting when available. The wheels shall work in a temperature range of [-40 to +95 degrees C](#)-40 to [+200 degrees F](#). The entire wheel assembly shall be symmetrical and shall spin concentrically around the bearing. Finish metal centers with either an epoxy paint, a powder coating, or manufacture galvanized. The diameter of the carrier wheels shall be [150 mm](#)[6 inches](#) and the diameter of the side wheels shall be [80 mm](#)[3-1/4 inches](#). The fabricator shall use appropriate washers and spacers to

lock the inner bearing bushing to the axle. Wheels shall be similar or equal to the following:

- a. 150 mm Dia. x 50 mm wide 6 inches Dia. x 2 inches wide
- b. 80 mm Dia. x 40 mm wide 3-1/4 inches Dia. x 1-1/2 inches wide

#### 2.1.7.2 Axles

The axle assembly shall be stainless steel and shall be eccentrically machined. A slotted adjustment cam plate shall be attached to the axle by welding as indicated on the drawings. Eccentric offset shall be a minimum of 6 mm 1/4-inch. Diameter, tolerance and finish of the mating axle shaft shall be coordinated with the wheel manufacturer's diameters and tolerances for a close fit. All fits and tolerances shall be indicated on the shop drawings. Material, weld, and nut shall all be a 300 series stainless steel.

### 2.2 FABRICATION

#### 2.2.1 General

Material must be straight before being laid off or worked. If straightening is necessary it shall be done by methods that will not impair the metal. Sharp kinks or bends shall be cause for rejection of the material. Material with welds will not be accepted except where welding is definitely specified, indicated or otherwise approved. Bends shall be made by approved dies, press brakes or bending rolls. Where heating is required, precautions shall be taken to avoid overheating or warping the metal and it shall be allowed to cool in a manner that will not impair the original properties of the metal. Proposed flame cutting of material other than structural steel shall be subject to approval and shall be indicated on detail drawings. Shearing shall be accurate and all portions of the work shall be neatly finished. Corners shall be square and true unless otherwise shown on the drawings. Re-entrant cuts shall be filleted to a minimum radius of 20 mm 3/4 inch unless otherwise approved. Finished members shall be free of twists, bends and open joints. Bolts, nuts and screws shall be tight.

#### 2.2.2 Dimensional Tolerances

Dimensions shall be measured by a calibrated steel tape of approximately the same temperature as the material being measured. The overall dimensions of an assembled structural unit shall be within the tolerances indicated on the drawings or as specified in the particular section of these specifications for the item of work. Where tolerances are not specified in other sections of these specifications or shown, an allowable variation of 1 mm 1/32 inch is permissible in the overall length of component members with both ends milled and component members without milled ends shall not deviate from the dimensions shown by not more than 1.5 mm 1/16 inch for members 30 feet or less in length and by more than 3 mm 1/8 inch for members over 9 m 30 feet in length.

#### 2.2.3 Steel

Structural steel may be cut, when approved, by mechanically guided or hand-guided torches, provided an accurate profile with a surface that is smooth and free from cracks and notches is obtained. Surfaces and edges to be welded shall be prepared in accordance with AWS D1.1/D1.1M, Subsection



3.2. Where structural steel is not to be welded, chipping or grinding will not be required except as necessary to remove slag and sharp edges of mechanically guided or hand-guided cuts not exposed to view. Hand-guided cuts which are to be exposed or visible shall be chipped, ground or machined to sound metal.

#### 2.2.4 Aluminum

Laying out and cutting of aluminum shall be in accordance with the AA ADM-105.

#### 2.2.5 Bolted Connections

##### 2.2.5.1 Bolted Steel Connections

Bolts, nuts and washers shall be of the type specified or indicated. Beveled washers shall be used where bearing faces have a slope of more than 1:20 with respect to a plane normal to the bolt axis. Bolt holes shall be accurately located, smooth, perpendicular to the member and cylindrical. Holes for Bolts shall be drilled or subdrilled and reamed in the shop and shall not be more than 1/16 inch larger than the diameter of the bolt unless otherwise approved, or as indicated on the drawings or specified below. Poor matching of holes will be cause for rejection. Drifting occurring during assembly shall not distort the metal or enlarge the holes. Reaming to a larger diameter of the next standard size bolt will be allowed for slight mismatching.

##### 2.2.5.2 Bolted Aluminum Connections

Punching, drilling, reaming and bolting for bolted aluminum connections shall conform to the requirements of AA ADM-105.

#### 2.3 MACHINE WORK

Tolerances, allowances and gauges for metal fits between plain, non-threaded, cylindrical parts shall conform to ASME B4.1 for the class of fit shown or required unless otherwise shown on approved detail drawings. Where fits are not shown they shall be suitable as approved. Tolerances for machine-finished surfaces designated by non-decimal dimensions shall be within 0.4 mm 1/64 inch, unless otherwise indicated on the drawings. Sufficient machining stock shall be allowed to ensure true surfaces of solid material. Assembled parts shall be accurately machined and all like parts shall be interchangeable. All drilled holes shall be accurately located.

##### 2.3.1 Finished Surfaces

Surface finishes indicated or specified herein shall be in accordance with ASME B46.1. Values of required roughness heights are arithmetical average deviations expressed in microinches. These values are maximum. Lesser degrees will be satisfactory unless otherwise indicated. Compliance with surface requirements shall be determined by sense of feel and visual inspection of the work compared to Roughness Comparison Specimens in accordance with the provisions of ASME B46.1. Values of roughness width and waviness height shall be consistent with the general type of finish specified by roughness height. Where the finish is not indicated or specified it shall be that which is most suitable for the particular surface, provide the class of fit required and be indicated on the detail drawings by a symbol which conforms to ASME B46.1 when machine finishing is

provided. Flaws such as scratches, ridges, holes, peaks, cracks or checks which will make the part unsuitable for the intended use will be cause for rejection.

#### 2.3.2 Unfinished Surfaces

All work shall be laid out to secure proper matching of adjoining unfinished surfaces unless otherwise directed. Where there is a large discrepancy between adjoining unfinished surfaces they shall be chipped and ground smooth or machined to secure proper alignment. Unfinished surfaces shall be true to the lines and dimensions shown and shall be chipped or ground free of all projections and rough spots. Depressions or holes not affecting the strength or usefulness of the parts shall be filled in an approved manner.

#### 2.4 WELDING

\*\*\*\*\*  
**NOTE: If the WPS is not prequalified designate the  
submittal in the SUBMITTALS paragraph for Government  
approval. If it is prequalified, designate as for  
information only.**  
\*\*\*\*\*

Submit the Welding Procedure Specification (WPS).

##### 2.4.1 Welding of Structural Steel

Welding shall be in accordance with AWS D1.1/D1.1M. Welding procedures which are considered prequalified as specified in AWS D1.1/D1.1M will be accepted without further qualification. Submit for approval a listing or an annotated drawing to indicate the joints not prequalified. Procedure qualification shall be required for these joints.

##### 2.4.2 Welding of Aluminum

Welding of aluminum shall conform to AA ADM-105 or AWS D1.2/D1.2M, Sections 1 through 7, 9 and 10. The welding process and welding operators shall be prequalified as required by AWS D1.2/D1.2M, Section 5 or AA ADM-105 in accordance with the methods described in ASME BPVC SEC IX, Section IX. Submit a certified report giving the results of the aluminum welding qualification tests. Also, submit a complete schedule of the welding process for each aluminum fabrication to be welded prior to commencing fabrication.

##### 2.4.3 Welding Inspection

Maintain an approved inspection system and perform required inspections in accordance with Contract Clause CONTRACTOR INSPECTION SYSTEM. Welding shall be subject to inspection to determine conformance with the requirements of AWS D1.1/D1.1M, the approved welding procedures and provisions stated in other sections of these specifications.

###### 2.4.3.1 Visual Examination

All completed welds shall be cleaned and carefully examined for insufficient throat or leg sizes, cracks, undercutting, overlap, excessive convexity or reinforcement and other surface defects to ensure compliance with the requirements of AWS D1.1/D1.1M, Section 3 and Section 9, Part D.

#### 2.4.4 Steel Welding Repairs

Defective welds shall be repaired in accordance with AWS D1.1/D1.1M, Section 5. Defective weld metal shall be removed to sound metal by use of air carbon-arc or oxygen gouging. The surfaces shall be thoroughly cleaned before welding. Welds that have been repaired shall be retested by the same methods used in the original inspection. Costs for repairs and retesting shall be borne by the Contractor. Submit repair procedure prior to doing repair.

### 2.5 MISCELLANEOUS PROVISIONS

#### 2.5.1 Metallic Coatings

Zinc Coatings. Zinc coatings shall be applied in a manner and of a thickness and quality conforming to ASTM A 123/A 123M. Where zinc coatings are destroyed by cutting, welding or other causes the affected areas shall be regalvanized. Coatings 2 ounces or heavier shall be regalvanized with a suitable low-melting zinc base alloy similar to the recommendations of the American Hot-Dip Galvanizers Association to the thickness and quality specified for the original zinc coating.

#### 2.5.2 Cleaning of Stainless Steel

Oil, paint and other foreign substances shall be removed from stainless steel surfaces after fabrication. Cleaning shall be done by vapor degreasing or by the use of cleaners of the alkaline, emulsion or solvent type.

### 2.6 SHOP TESTING

#### 2.6.1 Wheel Assembly Testing

The first wheel assembly shall be tested for correct fit and operation in the presence of the Contracting Officer unless otherwise waived in writing. The wheel shall rotate concentricly and smoothly on the bearings. The cam adjuster shall provide at least 3 mm/8 inch of adjustment in each vertical direction. Waiving of tests will not relieve the Contractor of responsibility for any fault in operation, workmanship or material that occurs before the completion of the contract or guarantee.

#### 2.6.2 Assembly Tests

Each rolling cover including the shell, carrier, frame, and temporary brackets shall be assembled in the shop to determine the correctness of the fabrication and matching of the component parts. Tolerances shall not exceed those shown on the drawings. Each cover assembly shall be closely checked to ensure that all necessary clearances have been provided and that binding does not occur in any moving part. Assembly in the shop shall be done on a straight and level floor or platform, the frame shall be mounted on temporary supports in a level position. The carrier shall move smoothly and with minimal effort. Misalignment or poor operation, or defects disclosed shall be immediately remedied by the Contractor without cost to the Government. Assembly, testing, and disassembly work shall be performed in the presence of the Contracting Officer unless waived in writing. Provide ten working days notice, in writing, of the first and each proceeding rolling cover assembly to the Contracting Officer.

## 2.7 PREPARATION FOR SHIPPING

Before disassembly for shipment each rolling cover subassembly shall be match-mark stamped (or as otherwise approved) to facilitate correct reassembly in the field. The location of stampings shall be indicated by circling with a ring of white chalk after the shop finish has been applied or as otherwise directed. Each subassembly shall be wood crated, slatted, skid mounted, or otherwise packaged such that abrasion does not occur during shipment.

## PART 3 EXECUTION

### 3.1 ASSEMBLY

All parts to be assembled shall be thoroughly cleaned. Packing compounds, rust, dirt, grit and other foreign matter shall be removed. Holes and grooves for lubrication shall be cleaned. Enclosed chambers or passages shall be examined to make sure that they are free from damaging materials. Where units or items are shipped as assemblies they will be inspected prior to installation. Pipe wrenches, cold chisels or other tools likely to cause damage to the surfaces of rods, nuts or other parts shall not be used for assembling and tightening parts. Bolts and screws shall be tightened firmly and uniformly but care shall be taken not to overstress the threads. When a half nut is used for locking a full nut the half nut shall be placed first and followed by the full nut. Threads of all bolts, nuts and screws shall be lubricated with a lubricant before assembly. Threads of corrosion-resisting steel bolts and nuts shall be coated with an approved antigalling compound. Driving and drifting bolts or keys will not be permitted.

### 3.2 PROTECTION OF FINISHED WORK

#### 3.2.1 Lubrication After Assembly

After assembly all wheels shall be pressure lubricated or oiled.

#### 3.2.2 Aluminum

Aluminum in contact with structural steel in the area of the cover shell fastener angle clips shall be protected against galvanic or corrosive action by being given a coat of zinc-chromate primer and a coat of aluminum paint.

### 3.3 ACCEPTANCE TESTING

The rolling cover shall be field tested to ensure proper wheel adjustments to eliminate binding and track misalignment. In addition, demonstrate to the Contracting Officer that the cover, and cover tracks are level. The rolling cover shall be rolled the full distance of the tracks. The test shall be repeated a sufficient number of times (minimum of three) to demonstrate proper operation. Misalignment or poor operation, or defects disclosed shall be immediately remedied without cost to the Government. Provide all personnel necessary to conduct the tests. Testing shall be performed in the presence of Contracting Officer. Notify the Contracting Officer, in writing, at least 7 days prior to testing operations.

-- End of Section --