UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021
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USACE / NAVFAC / AFCEC / NASA | **UFGS-05 59 10 (August 2018)**

Preparing Activity: USACE | **Superseding UFGS-05 59 10 (February 2010)**

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021

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SECTION 05 59 10

ROLLING COVER FOR AVIATION REFUELING VAULTS
08/18

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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 and Cover Hydrant Refueling System Standards. DoD Type III systems must conform to Standard Design AW 078-24-28 DOD PRESSURIZED HYDRANT FUELING SYSTEM TYPE III**. DoD Type IV/V systems must conform to** Standard Design AW 078-24-29 DOD STANDARD PRESSURIZED HYDRANT DIRECT FUELING SYSTEM TYPE IV/V**. Cut and Cover systems must conform to Standard Design AW 078-24-33 CUT AND COVER STANDARDS.**

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)**.**

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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 the vault schedule on the vault drawings. Covers are to be field installed on variously sized new and/or existing hydrant fueling system vaults and tanks.

1.1 REFERENCES

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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.

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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	(2020) Aluminum Design Manual

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B4.1	(1967; R 1994; R 2004; R 2009; R 2020) Preferred Limits and Fits for Cylindrical Parts
ASME B46.1	(2020) Surface Texture, Surface Roughness, Waviness and Lay
ASME BPVC SEC IX	(2017; Errata 2018) BPVC Section IX-Welding, Brazing and Fusing Qualifications

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2020) 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 A123/A123M	(2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A276/A276M	(2017) Standard Specification for Stainless Steel Bars and Shapes
ASTM A307	(2014; E 2017) Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
ASTM A563	(2015) Standard Specification for Carbon and Alloy Steel Nuts
ASTM A1085/A1085M	(2015) Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS)
ASTM B209	(2014) 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

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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.
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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-01 Preconstruction Submittals

Assembly Tests; G[, [_____]]

Acceptance Testing; G[, [_____]]

SD-02 Shop Drawings

Detail Drawings; G[, [_____]]

SD-03 Product Data

Wheel Assemblies; G[, [_____]]

Materials List; G[, [_____]]

Welding; G[, [_____]]

Welding of Aluminum; G[, [_____]]

Steel Welding Repairs; 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 must list the qualified welders by name and must specify the code and procedures for which they are qualified and the date of qualification. Prior qualification will be accepted if welders have performed satisfactory work under the code for which they have been 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 must be borne by the Contractor.

1.4.2 Workmanship

Workmanship must 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 must be continuous along the entire area of contact, except where tack welding is permitted. Exposed connections of work in place must not be tack welded. Exposed welds must be ground smooth. Exposed surfaces of work in place must have a smooth finish.

1.4.3 Detail Drawings

Submit detail drawings for metalwork and machine work prior to fabrication. Submit a materials list for fabricated items with the detail drawings. Detail drawings for metalwork and machine work must 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 must be detailed by the fabricator and indicated on the detail drawings. Drawings must 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 must be steel and must conform to ASTM A307, Grade A, Hex.

2.1.2 Nuts

Must conform to ASTM A563, Grade A, Hex, and must be of the same finish as the fasteners they are used with.

2.1.3 Washers

Flat washers must conform to the requirements of ASTM A276/A276M (stainless steel).

2.1.4 Tube Steel

Structural tubing must conform to ASTM A1085/A1085M.

2.1.5 Structural Steel

Carbon steel must conform to ASTM A36/A36M

2.1.6 Rolling Cover Shell

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

2.1.6.1 Aluminum

Aluminum sheets and strips must comply with ASTM B209, 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 must have solid rubber tires that are molded onto spoked or solid centers that are either cast, forged, or machined. The rubber must have a hardness rating of 80-90 Shore A durometer. Tires must not stretch or work loose from the metal center. The wheels must have roller bearings and must be pressure lubricated from a grease fitting when available. The wheels must work in a temperature range of -40 to +82 degrees C-40 to +180 degrees F. The entire wheel assembly must be symmetrical and must 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 must be 150 mm6 inches and the diameter of the side wheels must be 80 mm3-1/4 inches. The fabricator must use appropriate washers and spacers to lock the inner bearing bushing to the axle. Wheels must be similar or equal to the following:

a. 150 mm Dia. x 50 mm wide6 inches Dia. x 2 inches wide

b. 80 mm Dia. x 40 mm wide3-1/4 inches Dia. x 1-1/2 inches wide

2.1.7.2 Axles

The axle assembly must be stainless steel and must be eccentrically machined. A slotted adjustment cam plate must be attached to the axle by welding, as indicated on the drawings. Eccentric offset must be a minimum of 6 mm1/4-inch. Diameter, tolerance, and finish of the mating axle shaft must be coordinated with the wheel manufacturer's diameters and tolerances for a close fit. Submit shop drawings showing all fits and tolerances. Material, weld, and nut must 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 must be done by methods that will not impair the metal. Sharp kinks or bends must 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 must be made by approved dies, press brakes, or bending rolls. Where heating is required, precautions must be taken to avoid overheating or warping the metal, and it must 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 must be subject to approval and must be indicated on detail drawings. Shearing must be accurate, and all portions of the work must be neatly finished. Corners must be square and true unless otherwise shown on the drawings. Re-entrant cuts must be filleted to a minimum radius of 20 mm3/4 inch unless otherwise approved. Finished members must be free of twists, bends, and open joints. Bolts, nuts, and screws must be tight.

2.2.2 Dimensional Tolerances

Dimensions must 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 must 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 on the drawings, an allowable variation of 1 mm1/32 inch is permissible in the overall length of component members with both ends milled. Component members without milled ends must not deviate from the dimensions shown by not more than 1.5 mm1/16 inch for members 30 feet or less in length and by more than 3 mm1/8 inch for members over 9 m30 feet in length.

2.2.3 Steel

Structural steel may be cut, when approved, by mechanically guided or hand-guided torches as long as an accurate profile with a surface that is smooth and free from cracks and notches is obtained. Surfaces and edges to be welded must 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, must be chipped, ground, or machined to sound metal.

2.2.4 Aluminum

Laying out and cutting of aluminum must be in accordance with AA ADM.

2.2.5 Bolted Connections

2.2.5.1 Bolted Steel Connections

Bolts, nuts, and washers must be of the type specified or indicated. Beveled washers must 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 must be accurately located, smooth, perpendicular to the member, and cylindrical. Holes for bolts must be drilled or subdrilled and reamed in the shop and must not be more than 1/16 inch larger than the diameter of the bolt unless otherwise approved, indicated on the drawings, or specified below. Poor matching of holes will be cause for rejection. Drifting occurring during assembly must 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 must conform to the requirements of AA ADM.

2.3 MACHINE WORK

Tolerances, allowances, and gauges for metal fits between plain, non-threaded, cylindrical parts must 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 must be suitable as approved. Tolerances for machine-finished surfaces designated by non-decimal dimensions must be within 0.4 mm 1/64 inch, unless otherwise indicated on the drawings. Sufficient machining stock must be allowed to ensure true surfaces of solid material. Assembled parts must be accurately machined and all like parts must be interchangeable. All drilled holes must be accurately located.

2.3.1 Finished Surfaces

Surface finishes indicated or specified herein must 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 must 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 must be consistent with the general type of finish specified by roughness height. Where the finish is not indicated or specified, the finish selected must be the most suitable for that particular surface. Provide the class of fit required and indicate it on the detail drawings with 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 must be laid out to secure proper matching of adjoining unfinished surfaces, unless otherwise directed. Where there is a large discrepancy between adjoining unfinished surfaces, it must be chipped and ground smooth or machined to secure proper alignment. Unfinished surfaces must be true to the lines and dimensions shown and must be chipped or ground free of all projections and rough spots. Depressions or holes not affecting the strength or usefulness of the parts must be filled in an approved manner.

2.4 WELDING

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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.

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Submit the Welding Procedure Specification (WPS).

2.4.1 Welding of Structural Steel

Welding must 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 must be required for these joints.

2.4.2 Welding of Aluminum

Welding of aluminum must conform to AA ADM or AWS D1.2/D1.2M, Sections 1 through 7, 9 and 10. The welding process and welding operators must be prequalified as required by AWS D1.2/D1.2M, Section 5 or AA ADM, 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 must 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 must 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 must be repaired in accordance with AWS D1.1/D1.1M, Section 5. Defective weld metal must be removed to sound metal by use of air carbon-arc or oxygen gouging. The surfaces must be thoroughly cleaned before welding. Welds that have been repaired must be retested by the same methods used in the original inspection. Costs for repairs and retesting must 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 must be applied in a manner and of a thickness and quality conforming to ASTM A123/A123M. Where zinc coatings are destroyed by cutting, welding, or other causes, the affected areas must be regalvanized. Coatings 2 ounces or heavier must 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 must be removed from stainless steel surfaces after fabrication. Cleaning must 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 must be tested for correct fit and operation in the presence of the Contracting Officer, unless otherwise waived in writing. The wheel must rotate concentrically and smoothly on the bearings. The cam adjuster must provide at least 3 mm1/8 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, must be assembled in the shop to determine the correctness of the fabrication and matching of the component parts. Tolerances must not exceed those shown on the drawings. Each cover assembly must 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 must be done on a straight and level floor or platform; the frame must be mounted on temporary supports in a level position. The carrier must move smoothly and with minimal effort. Misalignment, poor operation, or defects disclosed must be immediately remedied by the Contractor without cost to the Government. Assembly, testing, and disassembly work must 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 must be match-mark stamped (or as otherwise approved) to facilitate correct reassembly in the field. The location of stampings must be indicated by circling with a ring of white chalk after the shop finish has been applied or as otherwise directed. Each subassembly must 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 must be thoroughly cleaned. Packing compounds, rust, dirt, grit, and other foreign matter must be removed. Holes and grooves for lubrication must be cleaned. Enclosed chambers or passages must 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 must not be used for assembling and tightening parts. Bolts and screws must be tightened firmly and uniformly but care must be taken not to overstress the threads. When a half nut is used for locking a full nut, the half nut must be placed first and followed by the full nut. Threads of all bolts, nuts, and screws must be lubricated with a lubricant before assembly. Threads of corrosion-resisting steel bolts and nuts must 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 must 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 must 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 must 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 must be rolled the full distance of the tracks. The test must be repeated a sufficient number of times (minimum of three) to demonstrate proper operation. Misalignment, poor operation, or defects disclosed must be immediately remedied without cost to the Government. Provide all personnel necessary to conduct the tests. Testing must 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 --