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UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated October 2007

SECTION 08 34 73

SOUND CONTROL DOOR ASSEMBLIES

10/06

NOTE: This specification covers the requirements for flush steel and wood sound retardant doors with Sound Transmission Classification (STC) ranging from 25 to 45. Doors are limited to standard height and width where noise control is required, relative to speech, music, office equipment, and general sounds

Sound retardant doors for complex and special applications, where noise control related to machinery, industrial process sounds, automotive, and aircraft sounds, are not included. Specification must be revised as required for the specific application.

Sound retardant door assemblies include the door, perimeter seals, and metal door frame. Some companies provide a complete guaranteed package consisting of door, frame, special threshold, seals, gasketing, and hardware.

Drawings must indicate door locations, sound transmission classification ratings required, UL label requirements, frame construction, fire and smoke ratings, details of perimeter seals, and door bottom and vision panel requirements.

Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

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

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).

PART 1 GENERAL

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 within the text by the basic designation only.

ARCHITECTURAL WOODWORK INSTITUTE (AWI)

AWI QSGSQCP (2004) Architectural Woodwork Quality Standards Illustrated

ASTM INTERNATIONAL (ASTM)

ASTM A 1008/A 1008M (2007) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardened

ASTM A 568/A 568M (2006a) Standard Specifications for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for

ASTM C 1036 (2006) Standard Specification for Flat Glass

ASTM D 1056 (2007) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber

ASTM D 2092 (1995; R 2001e1) Standard Guide for

Preparation of Zinc-Coated (Galvanized)
Steel Surfaces for Painting

ASTM D 4689

(1999; R 2005) Standard Specification for
Adhesive, Casein-Type

ASTM E 1289

(1997; R 2003) Standard Specification for
Reference Specimen for Sound Transmission
Loss

ASTM E 90

(2004) Standard Test Method for Laboratory
Measurement of Airborne Sound Transmission
Loss of Building Partitions and Elements

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 101

(2005; Errata 2006; TIA 2006; TIA 2006)
Life Safety Code, 2006 Edition

NFPA 252

(2003) Standard Methods of Fire Tests of
Door Assemblies

1.2 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.][for 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-02 Shop Drawings

Indicate perimeter seals, door-bottom devices and other hardware items to be assembled in the shop on Fabrication drawings for the following:

Hollow Metal Sound Retardant Doors
Wood Sound Retardant Doors

Include on Installation drawings a finish hardware schedule for each door (coordinate with Section 08 71 00 DOOR HARDWARE) and a hollow metal door frame schedule for each door indicating profile, dimensions, hardware reinforcement, and frame anchorage for the following items:

Hollow Metal Sound Retardant Doors
Wood Sound Retardant Doors

SD-03 Product Data

Submit Manufacturer's catalog data including STC ratings, and UL fire rating, where applicable, for the following items:

Hollow Metal Sound Retardant Doors
Wood Sound Retardant Doors
Door Frames
Vision Panels
Intumescent Seals and Gasketing
Thresholds
Astragals

SD-06 Test Reports

Test reports for the following shall be in accordance with paragraph entitled, "Guarantee," of this section.

Wind Loading Tests
Water Leakage Tests
Acoustical Tests
Air Infiltration Tests
Positive Pressure Tests

SD-07 Certificates

Submit Certificates for the following items and accessories showing conformance with the referenced standards contained in this section.

Hollow Metal Sound Retardant Doors
Wood Sound Retardant Doors
Door Frames
Vision Panels
Intumescent Seals,Gasketing [and Door Bottoms]

Thresholds
Astragals

1.3 COMPLIANCE, TESTING, AND GUARANTEE

NOTE: The three major U.S. testing organizations are (1) Intertek Testing Services (Warnock Hersey), (2) Factory Mutual Research, and (3) Underwriters Laboratories.

Determine if the doors qualify with the standard frame. If neither the frame nor the door is rated, a gasket system may be specified which will qualify the door/frame assembly. Failure to do so will result in the door assembly not qualifying for proper positive pressure labeling.

1.3.1 Compliance And Labeling

1.3.1.1 Category A Positive Pressure Fire Door Construction

Where requirements for positive pressure must be met, doors must include all requirements as part of the door construction per Category A guidelines as published by ITS/Warnock-Hersey. No intumescent is allowed on the frame. Only smoke gasketing applied around the perimeter of the frame to meet the "S" smoke rating is permissible in instances where smoke control is required.

1.3.1.2 Category B Positive Pressure Fire Door Construction

All door openings must comply with the applicable portions of NFPA 101 and NFPA 252. Incorporate field applied intumescent materials, applied by a licensed installer according to the manufacturers' instructions, which must be kept on file. Additional gasketing may be required to meet the 'S' smoke rating. Submit Certificate for Intumescent Seals, Gasketing[and Door Bottoms].

1.3.1.3 Labeling

All positive pressure door assemblies must carry the fire label for the complete opening, clearly identifying the:

- a. Manufacturer
- b. Third party testing and certification agency
- c. Fire door rating
- d. Installation limitations
- e. Compatible frame, hardware component ratings
- f. Compatible lite or vision panel component ratings
- g. Required building code information, including temperature and smoke rating.

1.3.2 Testing

1.3.2.1 Sound Transmission Classification (STC)

Provide Test reports prepared by a nationally recognized, independent laboratory for Acoustical Tests, Air Infiltration Tests, Wind Loading Tests,

and Water Leakage Tests indicating that the sound transmission classification (STC) of the proposed door, based on tests at 16 third-octave band frequencies from 125 to 4,000 hertz, is no less than the specified STC when tested in accordance with ASTM E 90, and that the door tested is hung in substantially the type of wall and frame as indicated and is fully operable with hardware and perimeter seals installed.

1.3.2.2 Positive Pressure

Provide Test reports, prepared by a nationally recognized, independent laboratory for Positive Pressure Tests, for all fire rated door assemblies, including Intumescent Seals, Gasketing[, and Door Bottoms].

1.3.3 Guarantee

Provide written guarantee that each door delivered to the project is equal in construction, sound transmission classification (STC), and positive pressure test rating where applicable, with appropriate labeling and markings, to that of the sample door tested. Clearly state in written guarantee that each door assembly, when installed in accordance with the manufacturer's printed instructions, will have an in-place STC within 3 decibels of the specimen tested. Submit the following test data and Certificates with the written Guarantee:

- Wind Loading Tests
- Water Leakage Tests
- Acoustical Tests
- Air Infiltration Tests
- Positive Pressure Tests

1.4 DELIVERY, HANDLING, AND STORAGE

Ship all doors in the manufacturer's undamaged individual cartons, securely bundled and wrapped with moisture-resistant covers and stored in accordance with the manufacturer's printed instructions in a dry, clean, and ventilated area.

Deliver and store wood doors in the building following the installation of concrete, terrazzo, plaster, or other wet materials, and only after the building has dried out and has a roof.

Maintain relative humidity in the building between 30 and 65 percent. Maintain the ambient temperature at 16 degrees C 60 degrees F minimum at the time of installation of wood doors.

Make final adjustment of seals when temperatures and humidity conditions approximate the interior conditions that will exist when the building is occupied.

1.5 FIELD MEASUREMENTS

Field verify all measurements prior to preparation of drawings and fabrication.

PART 2 PRODUCTS

2.1 GENERAL

Provide sound retardant door assemblies of the thickness, width, and height indicated, complete with perimeter seals, seal housings, gasketing, [automatic door bottoms,] thresholds, door frames, and astragals as required to conform to the specified STC per ASTM E 90 and **ASTM E 1289**.

2.2 STC RATING

NOTE: Delete inapplicable paragraphs. Drawings
must schedule the location and STC rating if more
than one STC rating is required.

Doors shall have an STC of at least [25] [30] [35] [40] [45].

STC of each door shall be not less than that indicated.

2.3 HOLLOW METAL SOUND RETARDANT DOORS

NOTE: Delete the paragraph heading and the
following paragraphs if wood sound retardant doors
are selected.

Door construction using steel facing sheets must conform to **ASTM A 1008/A 1008M**; and **ASTM A 1008/A 1008M**. Stretcher level flatness must conform to **ASTM A 568/A 568M**; not less than **1.52 millimeter 0.0598 inch** thick; free from pitting, scale, and surface defects; separated by a core construction designed to meet the required STC; and tested and rated in accordance with **ASTM E 90**.

Doors must have flush seamless face sheets and vertical edges, with continuous welded and smooth joints. Edges must be flush or rabbeted as required for perimeter seals.

Hardware reinforcement must be steel drilled, tapped to template requirements and welded in place. Provide minimum thicknesses as follows:

Butts, **3.79 millimeter 0.1494 inch**; locksets, **0.1196 inch 3.04 millimeter**; surface-applied hardware, **1.90 millimeter 0.0747 inch**.

Door surfaces must be visually flat and free from warp, waviness, and other surface irregularities and defects. Maximum allowable warp or twist must not exceed **3 millimeter 1/8 inch** when measured with a **2100 millimeter 7-foot** straightedge along the diagonal and must not exceed **1.5 millimeter 1/16 inch** when measured with a **2100 millimeter 7-foot** straightedge in the width or in any position along the length of the door.

NOTE: Delete the following paragraphs if UL labeled
sound retardant doors are not required. Select the
UL label rating, if required.

The drawings must indicate sound retardant UL doors.

Doors, including sound retardant type must bear the UL [3-hour A]
[1-1/2-hour B] [3/4-hour C] [1-1/2-hour D] label fire rating and the
specified STC.

Shop paint exposed door surfaces, including surfaces that are galvanized.

Shop paint concealed exterior door surfaces except galvanized surfaces.

Thoroughly clean all mill scale, rust, oil, grease, dirt, and other foreign
materials from surfaces before the application of the shop coat of paint.

**NOTE: Select the following paragraph if painted
galvanized surfaces are required for this project.**

After cleaning, galvanized surfaces must be free of paint in accordance
with **ASTM D 2092**, Method A, B, C, or D.

Apply to clean prepared dry surfaces one shop coat of rust inhibitive
metallic oxide or synthetic resin primer by brush, dipping, or other
approved method to provide a continuous minimum dry film thickness (dft) of
0.023 millimeter 0.9 mil (0.0009 inch).

2.4 **WOOD SOUND-RETARDANT DOORS**

**NOTE: Delete the paragraph heading and the
following paragraphs if metal sound retardant doors
are selected.**

**Drawings must indicate door thickness, width and height, trim, and frame
details.**

Construct doors with wood veneer facings separated by a core construction
designed to meet the required STC. Test, rate, and label in accordance
with **ASTM E 90**.

Comply with the **AWI QSGSQCP**, "Guide Specifications and Quality
Certification Program," for [premium] [custom] [economy] grade
constructions and to the requirements specified.

Perform beveling, prefitting, machining, mortising, and routing for
hardware, perimeter seals, and door bottom cutouts at the mill.

[Furnish [premium] [custom] [economy] grade door facings with standard
thickness face veneers conforming to **AWI QSGSQCP**, Type 1 for stain and
transparent job site-applied finish.]

[Apply medium density overlay door facings over a good grade of hardwood
conforming to **AWI QSGSQCP**, Type 3 for job site-applied paint finish.]

[Furnish plastic laminate door facings, **1.5 millimeter 1/16 inch** thick, in
decorator color and patterns as selected, conforming to **AWI QSGSQCP**, Type
4.]

 NOTE: Select the face veneer. Delete selections
 not used.

Delete all selections if medium density overlay
 facings or plastic laminate facings are required.

Face veneers shall be:

Face Veneer Species:	Remarks
[Afrormosia]	[_____]
[Alder]	[_____]
[Anegre]	[_____]
[Ash]	[_____]
[Avodire]	[_____]
[Bamboo]	[_____]
[Beech]	[_____]
[Birch]	[_____]
[Brazilian Cherry]	[_____]
[Bubinga]	[_____]
[Butternut]	[_____]
[Camphorwood]	[_____]
[Cedar]	[_____]
[Cherry-American]	[_____]
[Chestnut]	[_____]
[Cypress]	[_____]
[Ebony]	[_____]
[Elm]	[_____]
[Etimoe]	[_____]
[Eucalyptus]	[_____]
[Figueroa]	[_____]
[Fir, Douglas]	[_____]
[Gaboon]	[_____]
[Hickory]	[_____]
[Kevazinga]	[_____]
[Koa, Hawaiian]	[_____]
[Lacewood]	[_____]
[Laurel]	[_____]
[Limba]	[_____]
[Louro Preto]	[_____]
[Madrone]	[_____]
[Mahogany]	[_____]
[Makore]	[_____]
[Maple]	[_____]
[Mappa]	[_____]
[Mesquite]	[_____]
[Movingue]	[_____]
[Myrtle]	[_____]
[Oak]	[_____]
[Orientalwood]	[_____]
[Padauck]	[_____]
[Pearwood]	[_____]
[Pecan]	[_____]
[Pine]	[_____]
[Poplar]	[_____]
[Prima Vera]	[_____]

Face Veneer Species:	Remarks
[Purpleheart]	[_____]
[Redwood]	[_____]
[Rosewood]	[_____]
[Saplele]	[_____]
[Satinwood]	[_____]
[Sycamore]	[_____]
[Teak]	[_____]
[Walnut]	[_____]
[Wenge]	[_____]
[Yew]	[_____]
[Zebrawood]	[_____]

[Facing veneer shall match the [wall paneling] [wood flooring] [_____] in species, veneer cut, and finish.]

NOTE: Select the type of veneer cut. Delete all selections if medium density overlay facings or plastic laminate facings are required.

Veneer cut shall be:

[Burl]
 [Flat Cut]
 [Plain Cut]
 [Plain Sliced]
 [Figured]
 [Figured and Quartered]
 [Quartered]
 [Reconstituted]
 [Rotary]
 [Steamed Flat Cut]
 [Steamed Quartered]

NOTE: Delete the following paragraph if plastic-laminate doors are selected.

Clean and sand to smooth finish all doors to remove handling and storage marks, raised grain, minor surface marks and abrasions which are to receive a job site finish.

2.5 DOOR FRAMES

NOTE: Drawings must indicate frame profiles and dimensions.

Fabricate frames from steel sheets conforming to **ASTM A 1008/A 1008M**, not less than **1.90 millimeter 0.0747 inch** thick, and free from pitting, scale, stretcher strains, fluting, and surface defects.

Provide frames with **50 millimeter 2 inch** faces, profiles and dimensions as indicated, with mitered reinforced corners, welded the full depth of frame

and trim, with exposed surfaces ground smooth and flush. Close contact edges to hairline joints.

Furnish hardware reinforcement steel, drilled and tapped to template requirements, and welded in place. Weld galvanized dust covers over reinforcements. Provide minimum thicknesses as follows:

Butts, 4.7 millimeter 3/16 inch
Lock strike, 3.04 millimeter 0.1196 inch
Surface applied hardware 1.90 millimeter, 0.0747 inch

Locate frame anchors near the top and bottom of doors and at intermediate points not over 600 millimeter 24 inches on center. Provide a minimum of three anchors per jamb.

Provide floor anchor clips at each jamb with 50 millimeter 2 inch vertical adjustments on increments not exceeding 1.5 millimeter 1/16 inch.

Weld a temporary angle spreader to the bottom of each jamb and remove at the time of the frame installation.

Clean thoroughly all surfaces of all mill scale, rust, oil, grease, dirt, and other foreign materials before the application of the shop coat of paint.

Apply one shop coat of rust inhibitive metallic oxide or synthetic resin primer applied to clean, dry, and prepared surfaces by brush, dipping, or other approved method to provide a continuous minimum dft of 0.023 millimeter 0.9 mil (0.0009 inch).

2.6 VISION PANELS

NOTE: Delete the paragraph heading and the following paragraphs if vision panels are not required. Edit the first paragraph as required for metal or wood doors.

Furnish doors with vision panels complete with glazing. Frames, moldings, and stops must be 1.90 millimeter 0.0747-inch steel or wood to match the door finish, to the profile indicated, assembled with mitered corners and flush joints, and secured with countersunk phillips-head screws.

Glazing must be either a single thickness of acoustical plate glass laminated to an inner face of water-clear plastic or multiple thicknesses of 6 millimeter 1/4 inch plate glass, clear or patterned as indicated, and set in glazing gaskets and frames as required to meet the specified STC.

Provide glass to conform to ASTM C 1036, Type I, Class 1. Acoustical plate glass must be a type tested and rated in accordance with ASTM E 90, with an STC of not less than 36 and a minimum thickness of 7.14 millimeter 9/32 inch.

2.7 PERIMETER INTUMESCENT SEALS AND GASKETING

[Seal material for heads, jambs[, and door bottoms] must be a closed-cell, expanded cellular rubber conforming to ASTM D 1056, Type S, Grade SBE-42 or SCE-42.]

Install seals in formed steel or extruded aluminum shapes designed to receive and hold seals and to provide concealed adjustable attachment to door frames. Concealed adjustment screws not more than 300 millimeter 12 inches on center must provide at least 10 millimeter 3/8-inch adjustment.

NOTE: Include the following paragraph only if
automatic door bottoms are required.

Door bottoms must be assemblies of closed-cell neoprene seals, seal housings, and automatic operating devices, mounted on the doors as indicated. Design devices to seal the spaces between the doors and the finished floors or thresholds when closed and to retract immediately when doors are opened, with a sill clearance of approximately 6 millimeter 1/4 inch.

2.8 THRESHOLDS

NOTE: Select the type of threshold. Delete the
paragraph heading and both paragraphs if thresholds
are not required.

Provide metal thresholds where indicated. Thresholds must be extruded aluminum, 6063-T5 alloy, mill finish, not less than 3 millimeter 1/8 inch thick, with integral seal grooves formed to the indicated section.

Provide hardwood thresholds where indicated made of clear, all-heartwood, free of streaks, pin or worm holes, uniform in color, free of defects, finish sanded, and ready for job site transparent or paint finish.

2.9 ASTRAGALS

NOTE: Select the type of astragals. Delete the
paragraph heading and both paragraphs if astragals
are not required.

Provide steel astragals for the inactive leaf of each pair of doors, as indicated, surface mounted to the door by welded connections or by countersunk, flat-head screws, with an integral groove to receive perimeter seal material.

Provide wood astragals for the inactive leaf of each pair of doors. Astragals must be solid hardwood. Match the veneer and finish of doors. Surface mount to doors by screw fasteners or with waterproof and mold-resistant adhesive conforming to ASTM D 4689, Type II.

PART 3 EXECUTION

3.1 PREPARATION

Inspect door frames and obtain approval before commencing work.

Door frames must be plumb and true with not more than 0.8 millimeter 1/32-inch deviation in vertical alignment in 2440 millimeter 8 feet.

Anchor to the wall in accordance with the printed instructions of the manufacturer. Grout frames solid with mortar in masonry, concrete, and plaster wall construction. Spot grout frames in dry wall partitions with mortar at the jamb anchor clips; fill the space between metal frame and stud partition solidly with fiberglass or mineral wool insulation.

3.2 DOOR INSTALLATION

Install and adjust all doors, hardware, and seals in accordance with the approved drawings, hardware schedules, and the printed instructions of the door manufacturer.

**NOTE: Delete bracketed sentence in the first
paragraph and the second paragraph if automatic door
bottom devices are not applicable to the project.**

Install and adjust perimeter seals [and automatic door bottom seals] to provide positive compression contact with the entire sealing surface with no gaps, openings, or breaks. Hinges or hardware which distort or pinch the perimeter seal during operation of the door will be rejected.

Door bottom devices must seal the space between the door bottoms and the finished floor and the space between the seal and seal housing.

Field apply perimeter seal housings with mitered corners and with flush, aligned hairline joints.

-- End of Section --