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USACE / NAVFAC / AFCEC / NASA **UFGS-08 34 73 (November 2019)**

Change 1 - 02/21

Preparing Activity: NASA **Superseding**

UFGS-08 34 73 (February 2015)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021

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SECTION 08 34 73

SOUND CONTROL DOOR ASSEMBLIES
11/19, CHG 1: 02/21

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NOTE: This guide 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.

Exterior hollow metal door frames will require infill.

Sound retardant doors for complex and special applications, where noise control related to machinery, industrial process sounds, automotive, and aircraft sounds, are not included. Revise specifications 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. Typically, perimeter seals, hinges, and threshold are included in manufacturer's assembly.

Indicate on the drawings, door locations, required sound transmission classification (STC) ratings, required UL label, frame construction, required fire and smoke ratings, details of perimeter seals, and door bottom and vision panel requirements. Coordinate the balance of hardware with the hardware consultant.

Continuous hinges are not allowed at door and frame acoustic unit.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing

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

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

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

PART 1 GENERAL

1.1 REFERENCES

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

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

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

AMERICAN WELDING SOCIETY (AWS)

AWS D1.3/D1.3M	(2018) Structural Welding Code - Sheet Steel

ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M	(2019) Standard Specification for Carbon Structural Steel
ASTM A108	(2013) Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
ASTM A568/A568M	(2019a) Standard Specification for Steel,

	Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for
ASTM A1008/A1008M	(2020) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
ASTM A1011/A1011M	(2018a) Standard Specification for Steel Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
ASTM C143/C143M	(2020) Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C476	(2020) Standard Specification for Grout for Masonry
ASTM C1036	(2016) Standard Specification for Flat Glass
ASTM D1056	(2014) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM D4689	(2012) Standard Specification for Adhesive, Casein-Type
ASTM D6386	(2016a) Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting
ASTM E90	(2009; R2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
ASTM E336	(2020) Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings
ASTM E413	(2016) Classification for Rating Sound Insulation
ASTM E1289	(2008; R 2016) Standard Specification for Reference Specimen for Sound Transmission Loss

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 80	(2019) Standard for Fire Doors and Other Opening Protectives
NFPA 101	(2021) Life Safety Code

NFPA 252	(2017) Standard Methods of Fire Tests of Door Assemblies

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

36 CFR 1191	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines

UNDERWRITERS LABORATORIES (UL)

UL 10C	(2016) UL Standard for Safety Positive Pressure Fire Tests of Door Assemblies

WOODWORK INSTITUTE (WI)

NAAWS 3.1	(2017; 2018 Errata Edition) North American Architectural Woodwork Standards

1.2 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-02 Shop Drawings

Fabrication Drawings

SD-03 Product Data

Hollow Metal Sound Retardant Doors[; G[, [____]]]

Wood Sound Retardant Doors[; G[, [____]]]

Door Frames[; G[, [____]]]

Door Hardware[; G[, [____]]]

Door Frame Sound Infill[; G[, [____]]]

[Vision Panels[; G[, [____]]]

][Intumescent Seals and Gasketing[; G[, [____]]]

] Thresholds[; G[, [____]]]

[Astragals[; G[, [____]]]

] SD-06 Test Reports

Wind Loading Tests[; G[, [____]]]

Water Leakage Tests[; G[, [____]]]

Acoustical Tests[; G[, [____]]]

Air Infiltration Tests[; G[, [____]]]

Positive Pressure Tests[; G[, [____]]]

SD-07 Certificates

Hollow Metal Sound Retardant Doors[; G[, [____]]]

Wood Sound Retardant Doors[; G[, [____]]]

Door Frames[; G[, [____]]]

Door Hardware[; G[, [____]]]

[Vision Panels[; G[, [____]]]

][Intumescent Seals,Gasketing [and Door Bottoms][; G[, [____]]]

] Thresholds[; G[, [____]]]

[Astragals[; G[, [____]]]

] Assembly Test Reports

1.3 QUALITY CONTROL

Ensure work within this section is designed and furnished by one manufacturer, who has been engaged in the manufacture of Sound Retardant [Wood Swinging Door] [Hollow Metal Door] [_____] systems for at least five years prior to the start of this work.

Provide acoustic assemblies manufactured by a single source specializing in the production of this type work for a minimum of five years.

1.3.1 Compliance and Labeling

1.3.1.1 Compliance with Accessibility Requirements

Americans with Disabilities Act/Architectural Barriers Act (ADA/ABA) 36 CFR 1191

Accessibility Guidelines for Buildings and Facilities (ADAAG) 36 CFR 1191

[_____] (Insert appropriate accessibility standard)

1.3.1.2 Category A Positive Pressure Fire Door Construction

Where requirements for positive pressure are met, include for doors all requirements as part of the door construction per Category A guidelines as published by ITS/Warnock-Hersey. Intumescent is not allowed on the frame. Applying smoke gasketing around the perimeter of the frame to meet the "S" smoke rating is permissible in instances where smoke control is required.

1.3.1.3 Category B Positive Pressure Fire Door Construction

Conform all door openings to the applicable portions of NFPA 101 and NFPA 252. Incorporate field applied intumescent materials, applied by a licensed installer according to the manufacturers' instructions. Keep instructions on file. Additional gasketing may be required to meet the 'S' smoke rating. Submit Certificate for intumescent seals, gasketing[and door bottoms].

1.3.1.4 Labeling

Ensure all positive pressure door assemblies 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

g. STC rating if required.

Indicate fire-ratings of applicable components. Provide documentation of ABA/ADA accessibility compliance of applicable components, as required by 36 CFR 1191 Appendix D - Technical.

1.4 DELIVERY, STORAGE, AND HANDLING

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.

Store all materials on planks in a dry location. Store doors and frames vertically with minimum [_____] airspace between. Store doors on the edge to eliminate any potential damage to the door bottom seal. Cover all material to protect from damage but in a manner to allow proper circulation.

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.

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

1.5 WARRANTY

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NOTE: For projects other than NASA, consult various US Armed Forces requirements.

The warranty clause in this guide specification has been approved by NAVFACENGCOMHQ in accordance with the requirements of Naval Facilities Acquisition Supplement (NFAS).
NFAS can be found at the following link:

https://portal.navfac.navy.mil/portal/page/portal/navfac/navfac_forbusinesse

The paragraph in this guide specification may be used without any other HQ approval or request for waiver.

****

Manufacturer's warranty for [_____] [5] years from date of supply, covering material and workmanship. Failures include, but are not limited to, the following:

a. Failure to meet sound rating requirements

b. Faulty operation of sound seals

c. Deterioration of metals, metal finishes, and other materials beyond normal use or weathering.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

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 E90 and ASTM E1289.

Submit fabrication drawings for [Hollow Metal Sound Retardant Doors,][Wood Sound Retardant Doors,] Door Frames and Door Frame Sound Infill.

Submit certificates showing conformance with the referenced standards in this section, and 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; door hardware; [vision panels]; [intumescent seals and gasketing]; thresholds;[and] [astragals].

Provide assemblies that are complete with metal frame, wood door(s), sealing system, and Cam-lift hinges (when required).[If vision lights are specified for doors, provide metal loose stops and field install glass and glazing when shipped separately.]

2.1.1 Design Requirements

2.1.1.1 Door Design

Provide sound Retardant Wood Swinging Doors that are a 4.445 centimeter 1-3/4-inch thickness construction with sizes as indicated on drawings. No visible seams are permitted on door faces. Provide face gauges, internal sound retardant core and perimeter door edge construction per manufacturer's standard for the specified STC rating. No lead or asbestos is permitted in door construction to achieve STC performance. Provide face veneer species cut and color as selected from manufacturer's full range of available colors and patterns. No lead or asbestos is permitted in door construction to achieve performance requirements.

2.1.1.2 Frame Design

Provide sound Retardant Metal Frames conforming to ASTM A1008/A1008M, not less than 1.90 millimeter 0.0747-inch thick, and free from pitting, scale, stretcher strains, fluting, and surface defects with integral trim and shipped with temporary spreader. Knockdown frames are not acceptable.

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.

2.1.2 Performance Requirements

2.1.2.1 STC (Sound Transmission Classification) Rating

Provide doors with an STC [of at least [25] [30] [35] [40] [45]][per the door schedule].

2.2 FABRICATION

Provide doors that are minimum 16 gauge, 4.445 centimeter 1 3/4 inch thick with welded, seamless construction. No visible joints are permitted on the exposed faces or edges. Join door skins at vertical edges by continuous welds, ground and dressed smooth to provide a flush finish. Reinforce top and bottom with 1.52 millimeter16 gauge continuous inverted steel channels spot welded to both faces. Finish both top and bottom to provide a smooth flush condition. Bevel both vertical edges .3175 centimeter in 5.08 centimeter 1/8 inch in 2 inches.

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.

2.2.1 Hollow Metal Sound Retardant Doors

2.2.1.1 Construction

Conform to ASTM A1008/A1008M for door construction utilizing steel facing sheets. Conform stretcher level flatness to ASTM A568/A568M; 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 E90.

Provide doors that have flush seamless face sheets and vertical edges, with continuous welded and smooth joints. Provide edges that are flush or rabbeted as required for perimeter seals.

Provide door surfaces that are visually flat and free from warp, waviness, and other surface irregularities and defects. Maximum allowable warp or twist-can not exceed 3 millimeter 1/8 inch when measured with a 2100 millimeter 7 foot straightedge along the diagonal and 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.

Provide hardware reinforcement that is steel drilled, tapped to template requirements and welded in place. Provide minimum thicknesses as follows:

a. Butts, 4.7 millimeter 0.1494 inch

b. Lock strike, 3.04 millimeter 0.1196 inch

c. Surface applied hardware 1.90 millimeter 0.0747 inch

****

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

On drawings indicate sound retardant UL doors.

****

Provide doors, including sound retardant type, to 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.

2.2.1.2 Coating

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.

For exterior metal doors in coastal areas provide a minimum of G90 zinc galvanized coating.

****

After cleaning, provide galvanized surfaces free of paint in accordance with ASTM D6386, 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.

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

Shop paint the concealed exterior door surfaces except galvanized surfaces.

2.2.2 Wood Sound Retardant Doors

****

NOTE: On drawings 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 E90.

Comply with the NAAWS 3.1, "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 NAAWS 3.1, Type 1 for stain and transparent job site-applied finish.

][Apply medium density overlay door facings over a good grade of hardwood conforming to NAAWS 3.1, 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 NAAWS 3.1, Type 4.

]

****
Verify if selected veneers are part of the endangered species (CITES).
****

2.2.2.1 Faces

Single-ply wood veneer not less than 0.508 mm 1/50 inch thick.

a. Species: [Anigre] [Select white ash] [Figured select white ash] [Select white birch] [Select red birch] [Cherry] [Select red gum] [Figured select red gum] [Select white maple] [Red oak] [White oak] [Persimmon] [Sapele] [Sycamore] [Walnut] [_____].

b. Cut: [Rotary cut] [Plain sliced (flat sliced)] [Quarter sliced] [Rift cut].

c. Match between Veneer Leaves: [Book] [Slip] [Random] match.

d. Assembly of Veneer Leaves on Door Faces: [Center-balance] [Balance] [Running] match.

e. Pair and Set Match: Provide for doors hung in same opening[or separated only by mullions].

f. Room Match: Match door faces within each separate room or area of building. Corridor-door faces do not need to match where they are separated by [3 m10 feet] [6 m20 feet] [_____] or more.

g. Room Match: Provide door faces of compatible color and grain within each separate room or area of building.

h. Transom Match: [Continuous match] [End match] [As indicated].

i. Blueprint Match: Where indicated, provide doors with faces produced from same flitches as adjacent wood paneling and arranged to provide blueprint match with wood paneling.

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

2.2.3 Door Finishing

Conform factory finishing of Sound Retardant Wood Swinging Doors in accordance with AWI Quality Standards. Provide factory finish of a water-base stain and ultraviolet (UV) cured polyurethane sealer to comply with EPA Title 5 guidelines for Volatile Organic Compound (VOC) emissions limitations. Conform finish to meet or exceed performance standards of NAAWS 3.1 catalyzed polyurethane.

2.3 COMPONENTS

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NOTE: Indicate frame profiles and dimensions on drawings.

Coordinate with door manufacturer when exit devices are required. Removable mullions are not recommended over STC45.
****

2.3.1 Frames

Construct frames for Sound Retardant Wood Swinging Doors from formed sheet steel or structural shapes and bars. Provide sheet steel that is commercial quality, level, cold rolled steel conforming to ASTM A1008/A1008Mor hot rolled, pickled and oiled steel conforming to ASTM A1011/A1011M. Comply steel shapes with ASTM A36/A36M and steel bars with ASTM A108, Grade 1018.

2.3.2 Door Frame Sound Infill

[Grout: Comply with ASTM C476, with a slump of not more than 102 mm4 inches as measured according to ASTM C143/C143M.

][Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 0.381 millimeter15 mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

] Select the appropriate infill material [_____].

2.3.3 Hardware Reinforcements

Factory mortise, reinforce, drill and tap frames for all mortise hardware as required by hardware manufacturer's template. Provide necessary reinforcement plates as required for surface mounted hardware; installer to perform all field drilling and tapping. Provide dust cover boxes on all frame mortises. Provide minimum thicknesses as follows:

a. Butts, 4.7 millimeter 3/16 inch

b. Lock strike, 3.04 millimeter 0.1196 inch

c. Surface applied hardware 1.90 millimeter 0.0747 inch

2.3.4 Jamb Anchors

Provide number and spacing of anchors as follows:

2.3.4.1 Masonry Type

Locate anchors not more than 457 mm18 inches from top and bottom of frame. Space anchors not more than 813 mm32 inches o.c. and as follows:

a) Two anchors per jamb up to 1524 mm60 inches in height.

b) Three anchors per jamb from 1524 to 2286 mm60 to 90 inches in height.

c) Four anchors per jamb from 2286 to 2438 mm90 to 96 inches in height.

d) Four anchors per jamb plus one additional anchor per jamb for each 610 mm24 inches, or fraction thereof, more than 2438 mm96 inches in height.

2.3.4.2 Stud-Wall Type

Locate anchors not more than 457 mm18 inches from top and bottom of frame. Space anchors not more than 813 mm32 inches o.c. and as follows:

a) Three anchors per jamb up to 1524 mm60 inches in height.

b) Four anchors per jamb from 1524 to 2286 mm60 to 90 inches in height.

c) Five anchors per jamb from 2286 to 2438 mm90 to 96 inches in height.

d) Five anchors per jamb plus one additional anchor per jamb for each 610 mm24 inches, or fraction thereof, more than 2438 mm96 inches in height.

e) Two anchors per head for frames more than 1066 mm42 inches wide and mounted in metal-stud partitions.

2.3.4.3 Post-installed Expansion Type

Locate anchors not more than 152 mm6 inches from top and bottom of frame. Space anchors not more than 660 mm26 inches o.c.

2.3.5 Door Hardware

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NOTE: If required to meet the specified STC rating, list the required hardware such as cam-lift hinges, perimeter seals, astragals, door bottoms, thresholds and hardware standoff brackets as part of this sections deliverables. List and coordinate all other hardware under Section 08 71 00 DOOR HARDWARE.

Coordinate type of door bottoms with drawings either surface mounted, semi mortised or fully mortised. Clean rooms recommend mortised door bottoms.

****

Provide the following STC related hardware with the door; [cam-lift hinges][, perimeter seals][, astragals][, door bottoms][, thresholds][, hardware standoff brackets] and [_____].

Include on Fabrication drawings a finish hardware schedule for each door and a hollow metal door frame schedule for each door indicating profile, dimensions, hardware reinforcement, and frame anchorage. Also indicate perimeter seals, door-bottom devices and other hardware items that are assembled in the shop.

Refer to Section 08 71 00 DOOR HARDWARE for remaining hardware requirements.

[2.3.6 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.

Coordinate with Section 08 81 00 GLAZING.

Glazing Type: As scheduled on Drawings.
Glazing Type: Category II safety glass.
Glazing Type: One-way vision Category II safety glass.
Glazing Type: 6 mm1/4 inch fire rated ceramic safety glass.
****

Furnish doors with vision panels complete with glazing. Provide 1.90 millimeter 0.0747 inch steel or wood frames, moldings, and stop to match the door finish, with profile indicated. Assemble with mitered corners and flush joints, and secured with countersunk phillips-head screws.

Provide 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 C1036, Type I, Class 1. Provide acoustical plate glass that has been tested and rated in accordance with ASTM E90, with an STC of not less than 36 and a minimum thickness of 7.14 millimeter 9/32 inch.

][2.3.7 Head and Jamb Seals

[Provide a closed-cell, expanded cellular rubber Seal material conforming to ASTM D1056, Type S, Grade SBE-42 or SCE-42 for heads, jambs[, and door bottoms].

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

]2.3.8 Door Bottoms

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

Neoprene or silicone gasket held in place by metal housing; mortised into bottom edge of door.

2.3.8.1 Automatic Door Bottoms

Neoprene or silicone gasket, held in place by metal housing, that automatically drops to form seal when door is closed; mounted to bottom edge of door with screws.

Mounting: [Mortised or semimortised into bottom of door] [or] [surface mounted on face of door] as required by testing to achieve STC rating indicated.

2.3.9 Thresholds

****
NOTE: Select the type of threshold. Delete the

paragraph heading and both paragraphs if thresholds are not required.

The use of fluted threshold is not acceptable. Abrasive coated thresholds will cause premature wearing down of the door bottom neoprene and could cause the seal to pull out of its retainer and jam up under the door.

****

Provide metal thresholds where indicated. Provide thresholds that are 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 flat, smooth, unfluted thresholds as recommended by manufacturer; fabricated from [aluminum][stainless steel][solid wood matching wood door faces].

a. Finish: [Clear][Color] anodic finish.

b. Color: [Light bronze][Medium bronze][Dark bronze][Black][Match Architect's sample][As selected by Architect from full range of industry colors and color densities].

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.

[2.3.10 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 mount to the door by welded connections or by countersunk, flat-head screws, within integral groove to receive perimeter seal material.

][Provide wood astragals for the inactive leaf of each pair of doors. Provide astragals that are 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 D4689, Type II.

]]2.4 TESTS, INSPECTIONS, AND VERIFICATIONS

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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.

Verify with manufacturer of the infill material of the door frames.

Adhesive seals vs. compression seals.
****

2.4.1 Sound Transmission Classification

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 E90, 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.

2.4.2 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].

2.4.3 Cam Lift Hinges

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NOTE: Cam lift hinges are typically used on sound doors (STC). They lift the door up as it moves to the open position. Cam lift hinges can only be used with door closers that have a "Regular" style arm. Manual Closers: Maximum lift dimension is 3/4 inch. The following will not work with cam lift hinges: heavy duty parallel arm mount.
****

When required to achieve STC, manufacturer to furnish laboratory test data certifying hinges have been cycled a minimum of 1,000,000 while supporting a minimum door weight of 159 kg 350 pounds.

Full-mortise template type that raises the door 13 mm1/2 inch when door is fully open; with hardened pin; fabricated from stainless steel.

2.4.4 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, has an in-place STC within 3 decibels of the specimen tested. Submit the following test data and Certificates with the written Guarantee:

a. Wind Loading Tests

b. Water Leakage Tests

c. Acoustical Tests

d. Air Infiltration Tests

e. Positive Pressure Tests

PART 3 EXECUTION

3.1 PREPARATION

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NOTE: Zinc-coated (galvanized) thickness of coating designations G60 or G90 are available, but not recommended, except for use in extreme exposure conditions due to potential paint adhesion issues. Refer to ASTM A653/653M for additional information.
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Upon receipt of material, thoroughly inspect all frames, doors and accessories. Verify quantities and tag numbers according to the packing list provided. Report all discrepancies, deficiencies and/or damages immediately to Contracting Officer.

Prior to installation check all doors and frames for correct size and swing. Verify that frames are plumb, square and aligned without twist in accordance with tolerances published by NAAMM/HMMA and SDI.

3.1.1 Frame Painting and Cleaning

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 dry film thickness of 0.023 millimeter 0.9 mil.

3.2 INSTALLATION

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NOTE: The acoustic door manufacturer may have tested the infill of the hollow metal frames with acoustic liner instead of grout for non-fire-rated doors. Check manufacturers website for testing data.

Frames need to be backfilled with appropriate sound deadening material. Frames are not designed to act as forms for grout. It is recommended that the contractor be responsible for the grouting and for any required barrier coating.
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3.2.1 Frame

Install frames 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 manufacturer's instructions. 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.

Field splices may be required after installation because of shipping limitations. Field weld splices by certified welders per manufacturer's instructions and in accordance with AWS D1.3/D1.3M.

3.2.2 Door

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

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

Install door bottom devices to 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.

[Install wood doors and frames in accordance with [NFPA 80][UL 10C].

] Install components to manufacturer's written instructions. Coordinate with [masonry][gypsum board][concrete][_____] wall construction for anchor placement. Set frames plumb, square, level and at correct elevation. Adjust operable parts for correct clearances and function. Install and adjust perimeter and bottom acoustic seals.

[3.3 FIELD QUALITY CONTROL

Provide third party testing in accordance with ASTM E336. Verify in writing that installed product performs no less than five (5) ASTC or NIC rating points below the specified laboratory STC rating. Examine, adjust, and retest any installation not meeting that criteria until compliance is obtained.

3.3.1 Testing and Performance

Provide assemblies that are identical to those tested at an independent acoustical laboratory qualified under the National Voluntary Laboratory Accreditation Program (NVLAP) by the National Institute for Science and Technology (NIST) in accordance with ASTM E90 and ASTM E413. For the assembly test reports include the laboratory name, test report number and date of test.

] -- End of Section --