

**SECTION 083473**  
**SOUND CONTROL DOOR ASSEMBLIES**

**PART 1 - GENERAL** (ADD#01)

**1.1 DESCRIPTION**

- A. Steel acoustical door assemblies.

**1.2 RELATED WORK**

- A. Sustainable design requirements and procedures including submittal requirements: Section 018111, SUSTAINABLE DESIGN REQUIREMENTS.
- B. Procedures and requirements for managing and disposing construction and demolition waste: Section 017419, CONSTRUCTION WASTE MANAGEMENT.
- C. Section 087100 - Door Hardware.
- D. Section 088000 - Glazing.
- E. Section 099100 - Paints and Coatings.

**1.3 SUBMITTALS**

- A. Submit under provisions of Section 013323, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product data: Indicate door materials and construction.
- C. Shop drawings: Indicate door opening criteria, elevations, sizes, types, swings; identify and detail cutouts.
- D. Test Reports:
  - 1. Certified laboratory reports, performed in accordance with ASTM E90 and ASTM E 413, from independent testing laboratory qualified under the National Voluntary Laboratory Accreditation Program (NVLAP) supporting compliance of assemblies to specified requirements.
  - 2. Minimum five (5) field tests, performed in accordance with ASTM E 336 and ASTM E 413 by five separate independent testing agencies, substantiating acoustical performance when installed at no less than four (5) FSTC ratings below the specified STC rating.
- E. Certificates:
  - 1. Products of this section, as provided, meet or exceed specified requirements.
  - 2. Manufacturer of products of this section meet specified qualifications.
  - 3. Manufacturer's instructions: Printed installation instructions for each component.
- F. Closeout Submittals:
  - 1. Warranty documents, executed by manufacturer in Owner's name.
  - 2. Operation and maintenance data for assembly components.
  - 3. Certified statement of manufacturer's authorized representative, as specified in FIELD QUALITY CONTROL Article of PART 3 of this section.

4. Certified test reports of independent testing agency, as specified in FIELD QUALITY CONTROL Article of PART 3 of this section.
- G. LEED Submittals: Submit in accordance with Section 018111.
  1. LEED submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated LEED requirements.
  2. LEED Product Data Submittal Form: Submit completed product data form provided by the Contracting Officer's Representative; certified by vendor, installer, subcontractor, and/or manufacturer as appropriate.

#### **1.4 STORAGE AND HANDLING** (ADD#01)

- A. Store frames in accordance with requirements of HMMA 840.
- B. Store steel doors in accordance with requirements of HMMA 840.
- C. Remove wraps or covers from doors and frames upon delivery at the building site; clean and touch-up scratches or disfigurement caused by shipping or handling promptly with rust inhibitive primer.
- D. Store units on planks or dunnage in a dry location; store doors in a vertical position spaced by blocking.
- E. Store units covered to protect them from damage, but permitting air circulation.

#### **1.5 MAINTENANCE MANUALS**

- A. In accordance with section 010000, GENERAL REQUIREMENTS Article titled "INSTRUCTIONS," furnish two copies of maintenance manuals and instructions on automatic door operators.

#### **1.6 SCHEDULING**

- A. Furnish manufacturer's mounting templates for door hardware specified in Section 087100 to manufacturer of products of this section in time for factory preparation for door hardware.

#### **1.7 APPLICABLE PUBLICATIONS**

- A. ASTM A 1008 - Standard Specification for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
- B. ASTM A 569 - Standard Specification for Steel, Carbon, (0.15 Maximum Percent), Hot-Rolled Sheet and Strip, Commercial Quality.
- C. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.
- D. ASTM B 117 - Standard Method of Salt Spray (Fog) Testing.
- E. ASTM D 1735 - Standard Practice for Testing Water Resistance of Coating Using Water Fog Apparatus.
- F. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions.
- G. ASTM E 336 - Standard Test Method for Measurement of Airborne Sound Insulation in Buildings.
- H. ASTM E 413 - Classification for Determination of Sound

Transmission Class.

- I. HMMA 840 - Installation and Storage of Hollow Metal Doors and Frames; Hollow Metal Manufacturers Association.

**PART 2 - GENERAL** (ADD#01)

**2.1 DESIGN CRITERIA**

- A. Design requirements: Acoustical door assemblies to include doors, frames, and door hardware to include gasketing systems, retainers and retainer covers, automatic or fixed door bottoms, cam-lift hinges, thresholds, and sills, required to achieve specified performance requirements.
- B. Performance requirements: Sound Transmission Coefficient rating of STC 50 for installed assembly, when tested as operable door assembly in accordance with ASTM E 90 and ASTM E 413.

**2.2 MATERIALS**

- A. Steel sheet: One of the following:
1. Cold-rolled steel sheet conforming to ASTM A 1008, commercial quality.
  2. Hot-rolled steel sheet conforming to ASTM A 569, pickled and oiled, commercial quality.
- B. Galvanized steel sheet: ASTM A 653/A 653M, commercial quality, minimum G60 zinc coating.
- C. Acoustical material: Manufacturer's standard for required STC rating.
- D. Primer: Meeting ASTM B 117 salt spray for 150 hours, and ASTM D 1735 water fog test for organic coatings for 200 hours.
- E. Glazing: Specified in Section 088000.

**2.3 COMPONENTS**

- A. Steel doors: Fabricate in accordance with Architect-approved shop drawings, 1-3/4 inches minimum thickness, and as follows:
1. Face sheets:
    - a. Doors for interior use: Steel sheet, minimum 16 gage sheet thickness.
    - b. Doors for exterior use: Galvanized steel sheet, minimum 16 gage sheet thickness.
    - c. Visible seams on face sheets not permitted.
  2. Core:
    - a. Stiffen face sheets with continuous vertical steel sections.
    - b. Fill spaces between stiffeners with acoustical material.
  3. Vertical edges:
    - a. Join face sheets at vertical edges by continuous welding:
      - 1) Join door faces by continuous weld on each edge, extending full door height.
      - 2) Grind, fill, and dress welds to provide smooth flush surface.

- b. Form edge profiles both vertical edges of doors with 1/8 inch in 2 inches bevel.
  - c. Visible seams on vertical edges not permitted.
- 4. Horizontal edges:
  - a. Close top and bottom edges of doors with continuous steel channels, 16 gage minimum; spot-weld channels to both door faces.
  - b. Provide openings in bottom closure of exterior doors to permit escape of entrapped moisture.
  - c. Provide additional flush closing channel at top edge of doors; spot-weld channel to both door faces.
- 5. Hardware preparation:
  - a. Mortise, reinforce, drill, and tap doors at factory for fully templated mortised hardware only, in accordance with approved hardware schedule and supplied templates.
  - b. Provide reinforcing plates at surface-mounted or non-templated hardware locations. Surface applied hardware are drilled on site by others.
- B. Frames: Fabricate in accordance with Architect-approved shop drawings, and as follows:
  - 1. Frames for interior use: Fabricate from steel sheet, minimum 14-gage thickness.
  - 2. Form frame members straight, and of uniform profile through lengths, as welded units with integral trim, of sizes and profiles indicated.
    - a. Weld contact edges of joints closed tight.
    - b. Miter perimeter trim faces and weld continuously.
  - 3. When shipping limitations so dictate, fabricate frames for large openings in sections designed for assembly in the field; install alignment plates or angles, of same material and gage as frame, at each joint.
  - 4. Hardware preparation:
    - a. Mortise, reinforce, drill, and tap frames at factory for fully templated mortised hardware only, in accordance with Architect-approved shop drawings and supplied templates.
    - b. Provide reinforcing plates at surface-mounted or non-templated hardware locations.
  - 5. Floor anchors:
    - a. Fabricate of same material as frame material; minimum 14 gage.
    - b. Weld anchors inside each jamb for floor anchorage.
  - 6. Jamb anchors:
    - a. Fabricate of same material as frame material; weld anchors inside each jamb for wall anchorage.
    - b. Provide anchor types for indicated adjacent wall construction:
      - 1) Frames for installation in masonry walls: Adjustable jamb anchors, 16 gage, T-shape type.

- 2) Frames for installation in stud partitions: Continuous 16 gage steel channel to surround stud, welded inside each jamb.
7. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.
8. Plaster guards: Fabricate from minimum 22 gage steel; weld in place at hardware mortises on frames to be set in plaster, masonry, or concrete openings.
9. Provide welded frames with temporary steel spreader welded to jamb feet for bracing during shipping and handling.
- C. Vision lites:
  1. Factory-assemble lites in doors indicated to have lites, using glazing materials and assembly methods indicated on approved shop drawings for required STC rating; field assembly not permitted.
  2. Fabricate dual-glazed lites permitting individual removal of each glazing pane.
- D. Loose stops:
  1. Fabricate of minimum 12 gage steel, with factory-drilled and countersunk holes for fasteners.
  2. Form stops for mitered corner joints.
  3. Supply cadmium-coated or zinc-coated fasteners, size and quantity required for fastener holes.
- E. Door hardware:
  1. Supply gasketing systems, retainers, retainer covers, automatic door bottoms, fixed door bottoms, cam-lift hinges, thresholds, and sills as indicated on Architect-approved shop drawings, or specified in manufacturer's product data for project conditions, to achieve specified performance requirements.
- F. Other door hardware is specified in Section 087100.

#### **2.4 SILL CONDITION** (ADD#01)

- A. Where indicated on the drawings, furnish a smooth flush stainless steel or aluminum threshold for the door bottom to seal against when the door is in the closed position. The minimum width of the threshold shall be door thickness plus 4" to allow the threshold to extend a minimum of 1 ½" beyond the face of the door on both sides of the opening. For openings where carpet extends through the opening, the threshold height shall be 1/8" greater in height than the carpet thickness.

#### **2.5 FINISH**

- A. Finish: Tool marks and surface imperfections shall be removed and exposed faces of all welded joints shall be dressed smooth. Assemblies shall be treated and shall be coated on all accessible surfaces with a rust-inhibitive primer which meets ASTM B117 salt spray for 150 hours, and ASTM D1735 water fog test for organic coatings for 200 hours, and which is fully cured prior to shipment.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Prior to installation, check and correct frames for size, swing, squareness, alignment, twist and plumb.
- B. Verify openings are in accordance with approved shop drawings.
- C. Examine conditions under which construction activities of this section are to be performed, then submit written notification if such conditions are unacceptable.
- D. Beginning construction activities of this section indicates installer's acceptance of conditions.

### **3.2 INSTALLATION**

- A. Install units in accordance with approved shop drawings and manufacturer's printed installation instructions; in addition, install steel components in accordance with HMMA 840.
- B. Solidly grout fill frames where so indicated on the drawings or the approved submittals, eliminating all voids. The flanking path normally found behind the frame must be packed with either 6-12 lb rock wool insulation or grout filled to assure minimum sound transmission.
- C. Finish surfaces having abrasion damage smooth; touch-up with rust inhibitive primer.
- D. Install gasketing systems, retainers, retainer covers, automatic door bottoms, fixed door bottoms, cam-lift hinges, thresholds, and sills in accordance with manufacturer's printed instructions.
- E. Installation of other door hardware is specified in Section 087100.
- F. Hardware location on doors and frames:
  - 1. Hinges:
    - a. Top: 5 inches from head of frame to top of hinge.
    - b. Bottom: 10 inches from finished floor to bottom of hinge.
  - 2. Unit and integral type locks and latches: 38 inches from finished floor to centerline of lever.
  - 3. Deadlocks: 48 inches from finished floor to centerline of strike.
  - 4. Panic hardware: 38 inches from finished floor to centerline of cross bar, or as indicated on hardware template.
- G. Field painting is specified in Section 099100.
- H. Site tolerances: Do not exceed the following installation tolerances:
  - 1. Squareness: Plus or minus 1/16 inch measured on a line, 90 degrees from one jamb, at the upper corner of the frame at the other jamb.
  - 2. Alignment: Plus or minus 1/16 inch measured on jambs on a horizontal line parallel to the plane of the wall.
  - 3. Twist: Plus or minus 1/16 inch measured at face corners of jambs on parallel lines perpendicular to the plane of the wall.
  - 4. Plumb: Plus or minus 1/16 inch measured on the jamb at the

floor.

### **3.3 FIELD QUALITY CONTROL**

- A. Engage and pay for the field services of manufacturer's authorized representative to:
  - 1. Inspect completed installation of door and frame assemblies.
  - 2. Test components through a minimum of ten complete cycles of operation.
  - 3. Verify each component is correctly installed.
  - 4. Direct installer in adjusting components for correct operation.
  - 5. Issue certified statement of compliance of installed door and frame assemblies to Architect-approved shop drawings.
- B. Engage and pay for the services of independent testing agency to:
  - 1. Test door and frame assemblies selected by Owner or Architect in accordance with ASTM E 336.
  - 2. Issue certified report documenting compliance of installed door and frame assemblies to specified acoustical performance requirements.
- C. Notify Architect a minimum of 7 calendar days prior to scheduled testing dates.

### **3.4 MAINTENANCE**

- A. Instruct the Owner's Maintenance Personnel regarding the proper operation and maintenance of these doors.

### **3.5 CONSTRUCTION WASTE MANAGEMENT**

- A. General: Comply with Contractor's Waste Management Plan and Section 017419, CONSTRUCTION WASTE MANAGEMENT.
- B. To the greatest extent possible, separate reusable and recyclable products from contaminated waste and debris in accordance with the Contractor's Waste Management Plan. Place recyclable and reusable products in designated containers and protect from moisture and contamination.

END OF SECTION