SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

Revise this Section by deleting and inserting text to meet Project-specific requirements. When deleting, do not renumber all the paragraphs. Simply leave the section number and title as is, delete the text, and add the words "Not Used".

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Standard hollow metal doors and frames.

B. Related Sections:

1. Division 08 Section 08 71 00 "Door Hardware" for door hardware for hollow metal doors.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings.

B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, and finishes.

B. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings and removable stops.

C. Other Action Submittals:

1. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

E. Provide two material Samples for each color of Kynar Finish.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project Site storage. Do not use non-vented plastic.

1. Provide additional protection to prevent damage to finish of factory finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project Site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch-high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project Site in time for installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements:

Manufacturers listed below produce either standard or custom hollow metal work unless otherwise indicated.

Verify specific capabilities with individual manufacturers.

1. Ceco Door Products; an Assa Abloy Group company.

2. Fleming Door Products Ltd.; an Assa Abloy Group company.

3. Steelcraft; an Ingersoll-Rand company.

4. Approved equal.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

First option in first paragraph below is default for standard hollow metal work. Retain second option for custom hollow metal work or for increased protection of standard hollow metal work.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 metallic coating.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

Retain first paragraph below if powder-actuated fasteners are allowed.

E. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type indicated.

F. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6 to 12 pounds per cubic foot density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

G. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 STANDARD HOLLOW METAL DOORS

A. Provide 1-3/4-inch-thick doors of materials and ANSI/SDI-100 grades and models specified below, or as indicated on drawings or schedules:

1. Exterior Doors: Level 3, Model 3 – Seamless (with center rail)

a. Exterior doors shall be minimum 16-gauge galvanized or galvanealed steel with both lock and hinge rail edge of door intermittently welded, filled, and ground smooth the full height of door. Exterior doors shall be insulated with a solid slab of expanded polystyrene or polyurethane foam permanently bonded to the inside of each face skin. The top of all doors shall be closed flush by the addition of a 16-gauge screwed-in top cap and sealed to prevent water infiltration. The bottom channel shall include weepholes.

1) Ceco Door, Inc.

2) Curries, Inc.

3) Steelcraft, Inc.

4) Approved equal.

B. All doors shall be reinforced for hardware as shown below where necessary to preclude the use of thru bolts.

1. Exit Devices: 14-gauge

2. Door Closers: 12-gauge

C. All doors shall be beveled 1/8-inch in 2-inch and shall have top and bottom channels of not less than 16-gauge, flush or inverted, welded to the face sheets. Doors shall have a full height 14-gauge hinge rail reinforcement channel, or individual 10-gauge hinge reinforcements.

D. All doors to conform to ANSI-A250.4 Level "A" criteria and shall be tested to 1,000,000 operating cycles and 23 twist tests. Certification of Level "A" doors is to be submitted with approval drawings by supplier upon request. Do no bid or supply any type or gauge of door not having been tested and passed these criteria.

2.4 STANDARD HOLLOW METAL FRAMES

A. Provide hollow metal frames for doors of types and styles as shown on the drawings and schedules. Conceal fastenings unless otherwise indicated.

1. Exterior Frames: Level 2, 16-gauge, galvanized or galvanealed

2. Security Grade Frames: 14-gauge

a. Ceco: SU Series

b. Curries: M Series

c. Steelcraft: F Series

B. All frames over 36-inch in width shall be 14-gauge.

C. Fabricate frames with mitered and faces only welded corners, re-prime at the welded areas. All welds to be flush with neatly mitered or butted material cuts.

D. All frames shall have minimum 7-gauge hinge reinforcements, 14-gauge lock strike reinforcing, and 12-gauge closer reinforcing.

E. All frames shall have minimum 7-gauge hinge reinforcements with an additional high frequency 12-gauge hinge reinforcement welded to the top hinge, 14-gauge lock strike reinforcing, and 12-gauge closer reinforcing.

F. Provide temporary shipping bars to be removed before setting frames.

G. Except on weather-stripped frames, drill stops to receive three silencers on strike jambs of single frames and two silencers on heads of double frames.

H. Provide minimum 0.0179-inch-thick steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

2.5 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in Manufacturer's plant. To ensure proper assembly at Project Site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

C. Hollow Metal Doors:

1. Astragals: Provide overlapping astragal on one leaf of pairs of doors where indicated. Extend minimum 3/4-inch beyond edge of door on which astragal is mounted.

D. Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

3. Jamb Anchors: Provide number and spacing of anchors as follows:

Fire ratings may require additional anchors.

a. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches on center and as follows:

1) Three anchors per jamb up to 60 inches high.

2) Four anchors per jamb from 60 to 90 inches high.

3) Five anchors per jamb from 90 to 96 inches high.

4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.

5) Two anchors per head for frames above 42 inches wide and mounted in metal-stud partitions.

4. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.

a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

E. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.

F. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section 08 71 00 "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.

2. Reinforce doors and frames to receive non-templated, mortised and surface-mounted door hardware.

3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

G. Stops and Moldings: Provide stops and moldings around steel panel where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.

2. Provide loose stops and moldings on inside of hollow metal work.

2.6 STEEL FINISHES

A. Prime Finish: Apply Manufacturer's standard primer immediately after cleaning and pretreating.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by Primer Manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2. Finish Coat:

a. Door - Kynar 2-Mil Finish - Gun Metal Grey

b. Frame –Kynar 2-Mil Finish – color replication of stainless steel

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

Retain first paragraph below if required. If not, delete the text, and add the words "Not Used"

C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:

1. Squareness: Plus or minus 1/16-inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

2. Alignment: Plus or minus 1/16-inch, measured at jambs on a horizontal line parallel to plane of wall.

3. Twist: Plus or minus 1/16-inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

4. Plumbness: Plus or minus 1/16-inch, measured at jambs on a perpendicular line from head to floor.

C. Drill and tap doors and frames to receive non-templated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and Manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.

1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.

b. Install frames with removable glazing stops located on secure side of opening.

c. Install door silencers in frames before grouting.

d. Remove temporary braces necessary for installation only after frames have been properly set and secured.

e. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

f. Field apply bituminous coating to backs of frames that are filled with grout containing anti-freezing agents.

2. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

a. Squareness: Plus or minus 1/16-inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

b. Alignment: Plus or minus 1/16-inch, measured at jambs on a horizontal line parallel to plane of wall.

c. Twist: Plus or minus 1/16-inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

d. Plumbness: Plus or minus 1/16-inch, measured at jambs at floor.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

Edit clearances to fit project.

a. Jambs and Head: <_____> -inch plus or minus <_____> -inch.

b. Between Edges of Pairs of Doors: <_____> -inch plus or minus <_____> -inch.

c. Between Bottom of Door and Top of Threshold: Maximum <_____> -inch.

d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum <_____> -inch.

D. Steel Panel: Comply with installation requirements in Hollow Metal Manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches on center and not more than 2 inches on center from each corner.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to Manufacturer's written instructions.

END OF SECTION

SECTION 08 71 00 - DOOR HARDWARE

Some of the paragraphs may be deleted. When deleting, do not renumber all the paragraphs. Simply leave the section number and title as is, delete the text, and add the words "Not Used".

PART 1 GENERAL

1.1 DESCRIPTION

A. The Work specified in this Section includes the requirements for furnishing and installing door hardware as designated in the Contract.

1. Furnish door hardware in accordance with hardware groups scheduled. Coordinate with existing plant master keying system.

2. Furnish templates and hardware list of hardware as required.

1.2 DEFINITIONS

A. References

1. American National Standards Institute (ANSI)

   a. A115.1 – Specification for Standard Steel Door and Frame Preparation for Mortise Locks and 1-3/8-inch and 1-3/4-inch Doors.

   b. A156.18 – Materials and Finishes.

2. ASTM International (ASTM)

   a. E90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

   b. E152 – Fire Tests of Door Assemblies

   c. E283 – Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.

3. Door and Hardware Institute (DHI) - A115 Series

   a. RL - Recommended Locations for Builders Hardware for Standard Steel Doors and Frames.

4. Underwriter Laboratories (UL)

   a. 10B – Fire Tests of Door Assemblies

SSC is for Oregon projects, IBC for Washington projects. Check state requirements for other project locations.

5. [Structural Specialty Code (SSC)] [International Building Code (IBC)] [ ]

6. NFPA 101: Life Safety Code

1.3 SUBMITTALS

A. Comply with the requirements of Section 01 33 00, Submittal Procedures.

B. Product Data: Submit Contractor's product data for each item of door hardware, installation instructions, and maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

1. Final hardware schedule, incorporating the Owner's Representative's door numbering system, coordinated with doors, frames, and related Work to ensure proper size, thickness, hand, function, and finish of door hardware.

2. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:

a. Type, style, function, size, and finish of each hardware item.

b. Name and Contractor of each item.

c. Fastenings and other pertinent information.

d. Location of each hardware set cross-referenced to indications on the Drawings both on floor plans and in door and frame schedule.

e. Explanation of all abbreviations, symbols, and codes contained in schedule.

f. Mounting locations for hardware.

g. Door and frame sizes and materials.

h. Keying information.

C. Templates for doors, frames, and other Work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.4 QUALITY ASSURANCE

A. Supplier shall have a factory direct status with all manufacturers specified.

1.5 PROJECT CONDITIONS

A. Coordinate the Work with other directly affected Sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.

B. Provide construction cylinders during Project's construction through arrangement with the specified Cylinder Contractor. Return-for-credit arrangements with Cylinder Contractor at the end of construction.

C. Coordinate Owner's keying requirements during the course of the Work.

PART 2 PRODUCTS

2.1 MATERIALS

A. Contractors

1. Acceptable Manufacturers: As follow:

a. Butts and Hinges: McKinney, Stanley. "MCK, STN"

b. Lockset and Latchset: Best lock. "BST"

c. Cylinders: Best lock. "BST"

d. Overhead Closers: LCN, Norton. "LCN, NTN"

e. Stops: Quality. "QLTY"

f. Gasketing: Pemko. "PEM"

g. Thresholds: Pemko. "PEM"

h. Latch Guards: Glynn-Johnson. "GLN"

i. Astragals: Pemko. "PEM"

B. General

1. Fasteners

a. Furnish necessary screws, bolts, and other fasteners of suitable size and type to anchor the hardware in position for long life under hard use.

b. Where necessary, furnish fasteners with toggle bolts, expansion shields, sex bolts, and other anchors approved by the Owner's Representative, according to the material to which the hardware is to be applied and according to the recommendations of the Hardware Contractor.

c. Provide fasteners, which harmonize with the hardware as to finish and material.

2. Where butts are required to swing 180 degrees, furnish butts of sufficient throw to clear the trim.

3. Furnish silencers for doorframes at the rate of three for each single door and two for each door or pair of doors except weather-stripped doors and doors with light seals, smoke seals or sound seals.

4. Tools and Manuals: Deliver to the Owner one complete set of adjustment tools and one set of maintenance manuals for locksets, closers, and panic devices in accordance with Project close-out requirements.

C. Keying

1. Door Locks: The Owner will provide all keys and keying, using Best 5AAA keyway system to establish the facility standards.

2. Provide a construction keying system for Contractor's and/or Owner's use during construction. Provide five construction keys for Owner use during construction period. Contractor shall retain construction keys and inserts and turn over to the Owner upon completion of construction.

3. Coordinate the changeover to permanent keyways with the Owner at completion of station commissioning.

D. Hinges

1. Provide butt hinges of the five-knuckle, full mortise type, having two or four ball or iolite bearing as noted, stainless steel pins, and complying with ANSI A156.1.

2. Provide all out swinging doors to the exterior with butt hinges of the stainless steel or non-ferrous materials, with non-removable pins of the set screw.

3. Hinge size: Door 1-3/4-inch in thickness to 38-inch in width shall be provided with 4-1/2-inch x4-inch butt hinges provided with at least two ball or iolite bearing; wider and heavier doors with 5-inch x 4-1/2-inch extra heavy butt hinges provided with four ball or iolite bearing.

4. Number of hinges per door leaf: Provide three hinges per leaf for door up to 86-inch high, one additional butt hinge for each additional 30 inches of height, or fraction thereof.

E. Locksets and Latchsets

1. Cylinders: The Contractor shall furnish and install all screw-in type cylinders and keyways to establish the facility standard. The Contractor shall provide construction cylinders and keys for use during construction. Following acceptance, Owner will re-key the cylinders with Bestlock 5AAA cylinders.

2. Lock Type: For all exterior doors where cylindrical locksets or latches are called for, provide locks of the Best 9K Heavy Duty Lever Type, with backset of 2-3/4-inch, unless otherwise noted. Provide all locks for the entire Project from the same manufacturer.

3. Design: Provide lever handles at all locksets of the Best 9K Series, unless otherwise noted.

4. Strikes: Provide each lockset, handset, or deadlock with a box strike. Provide standard type strikes with extended lips where required to protect adjacent trim from being marred by latch bolt. Verify cutout types provided in metal frames.

5. All padlocks shall be provided and installed by the Owner when it takes over the operation of the facility. During construction, the Contractor is to provide temporary construction padlocks as needed. Contractor is to provide the Owner a minimum of five construction keys for use during the construction period.

F. Closers

1. General

SSC reference for Oregon projects, based on 2019 Oregon SSC and IBC for Washington projects, based on 2018 IBC.

a. [Comply with SSC, Section 1010.1.3 for maximum effort to operate doors.] [Comply with IBC, Section 1010.1.3 for maximum effort to operate doors.] [.]

b. Closers are attached with sex bolts.

c. Adjust closers in accordance with Contractor's directions for size of door.

d. Provide modern closers having:

1) Full rack and pinion with steel spring and non-gumming, nonfreezing hydraulic fluid.

2) Provide complete set of separate controls for regulating sweep speed, latch speed, backcheck, and backcheck positioning. Sizes as recommended by reviewed Contractor.

2. Door Surface Applied Modern Closers

a. Provide drop plates at doors having narrow frames.

b. Product: LCN or equal.

3. Quantity: Provide each leaf in pairs of doors scheduled to receive closers.

Coordinate with architect on requirements "panic hardware" when electrical service is 800 amps or greater. Typically referred to as Cross-Bar Exit Device for Emergency Egress.

G. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:

a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.

b. Sargent Manufacturing (SA) - 80 Series.

H. Stops and Holders

1. It is the intent of these specifications that each door leaf is provided with a door stop.

2. Built-in stops in door closers, wall bumpers, and overhead stops, where called for, shall satisfy the requirements of this paragraph. Provide stops of proper size and height to prevent doors from hitting walls of fixed objects.

I. Thresholds

1. Thresholds shall conform to BHMA A156.21. Thresholds for exterior doors shall be extruded aluminum and shall provide proper clearance and an effective seal with specified gasketing. Threshold shall be set in a full bed of mastic.

2. Provide countersink, flathead screws, same material, and finish as threshold.

J. Door Bottom

1. Door Bottoms shall be surface type with aluminum housing cover, anodized clear finish. Door bottoms shall have a neoprene seal and shall be actuated by the opening and closing of the door. The door bottoms shall exclude light when the door is in the closed position and shall inhibit the flow of air through the unit.

2. Provide countersink, flathead screws, same material, and finish as door bottom.

K. Gasketing

1. Gasketing shall be compressive type seal, silicon based, self-adhesive product for use on steel door frames with steel doors for 20 minutes and1-hour B labels. Air leakage rate of weather-stripping shall not exceed 0.5 cubic feet per minute per linear foot of crack when tested in accordance with ASTM E283 at standard test conditions.

2. Provide countersink, flathead screws, same material, and finish as door gasketing.

L. Silencers

1. Provide each door with a press-metal frame with rubber silencers. Omit at doors to receive gasketing. Provide each single door with three silencers, each pair of doors with four.

M. Finishes

1. All hardware shall have brushed chrome finish (626) for interior and exterior installation typically, unless noted otherwise.

   a. Provide over steel base metal (BHMA 626), typical, where required by code.

   b. Provide over bronze base metal (BHMA 612) for exterior installations and unheated spaces expose to the weather, unless otherwise noted. Exterior installations include exit doors to covered exterior pads and walkway locations, loading dock areas, areaways, and where noted.

2. All thresholds and weather-strip shall be fabricated of extruded aluminum, clear anodized finish, to match specified finish of other aluminum, unless noted otherwise.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install hardware in accordance with Contractor's instructions and requirements of AMSI/NFPA 80, and DHI. Use the templates provided by the Hardware Item Contractor.

B. Provide architectural finish hardware with all necessary (plus prudent spares) screws, bolts, or other devices or fastenings of suitable size and type to secure the hardware in position for heavy use and long life, harmonizing as to material and finish. These fastening shall be furnished, where necessary, with expansion shields or other approved anchors according to the material to which it is applied and as recommended by the Contractor. Secure all hardware to concrete with expansion sleeve anchors as indicated by best current practice; plastic or "Rawl" plugs will not be permitted. Hardware screws shall be of sufficient length to firmly engage backing and shall be fully threaded. All screws normally exposed to view, including all screws for butt hinges, shall have "Phillips" heads, finish to match hardware.

C. Keying:

1. Owner will remove construction plugs and install permanent cylinders as required.

2. The master key chart will be furnished by the Owner. The Owner is responsible for all keying and permanent keys. Contractor shall provide construction cylinders and keys as required during construction.

3.2 FINISHING

A. Typical: Brushed stainless steel, US32D.

B. Adjusting, Cleaning, and Demonstrating

1. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made. The operation of the ventilation system does not cause doors to slam shut or fail to close completely.

a. Adjust operation of all doors to meet ADA and [SSC, Section 1010.1.3 for requirements for opening force.] [IBC, Section 1010.1.3 for requirements for opening force.] [.]

b. Where door hardware is installed more than 1 month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area.

c. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

C. Clean adjacent surfaces soiled by hardware installation.

D. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.

3.3 SCHEDULE OF DOOR HARDWARE GROUPS

Update Door Hardware Schedule to align with project requirements.

HW SET:01

DOOR NUMBER:

D1

8	EA	HINGE	5BB1-HW 4.5 X 4.5	626	IVE
2	EA	EXTENSION FLUSH BOLT	458B26D	626	IVE
1	EA	LOCKSET	93K7D15D	626	BST
1	EA	STRIKE	S3	626	BST
1	EA	CYLINDER	86B	626	BST
1	EA	ASTRAGAL	by door mfgr	---	---
2	EA	SURFACE CLOSER	4011	626	LCN
1	SET	GASKETING	S44D (HEAD & JAMBS)	BRN	PEM

END OF SECTION

SECTION 08 91 19 - FIXED LOUVERS

Some of the paragraphs may be deleted. When deleting, do not renumber all the paragraphs. Simply leave the section number and title as is, delete the text, and add the words "Not Used".

PART 1 GENERAL

1.1 DESCRIPTION

Louvers are frequently used in connection with mechanical equipment as a means of introducing or expelling air through an exterior wall. Louvers allow the passage of air while providing weather protection for the interior. Louvers are considered an architectural item by industry convention, but they are often specified by engineers because they are used in conjunction with mechanical and electrical equipment. They are most frequently used with mechanical systems found in pump stations and electrical/controls buildings.

Coordinate with the Project Architect on items such as louver size and finish. The louver's wall opening size and location should be coordinated with the Architect and Structural Engineer.

The free area of a louver is the minimum area through which air can pass (i.e., total area of open spaces between the blades). The minimum free area required is found by dividing the louver's air flow by the desired maximum air velocity.

A. Scope:

1. This Section includes intake and exhaust stationary air louvers and accessories.

B. Section Includes:

1. Louvers

2. Screens

C. Related Sections:

1. Section 05 50 00 - Metal Fabrications

2. Section 09 90 00 - Painting and Coatings

1.2 SUBMITTALS

A. Manufacturer's catalog and/or other data confirming conformance to specified design, material, and equipment requirements.

B. Certified results of pressure drop test data and water penetration data. The equipment list should identify each louver with an equipment number and indicate the room or structure in which it is located.

C. Louvers shall bear the AMCA certified ratings seal for both air performance and water penetration.

1.3 REFERENCE STANDARDS

A. Aluminum Association (AA):

1. AA 45 - Designation System for Aluminum Finishes.

B. Air Movement and Control Association (AMCA) International:

1. AMCA Standard 500 - Test Methods for Louvers, Dampers, and Shutters.

C. ASTM International (ASTM):

1. ASTM B221 - Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

PART 2 PRODUCTS

Galvanized steel blades and frames are also available from the listed manufacturers but are not recommended for use in water and wastewater facilities.

2.1 MANUFACTURERS

Manufacturers include Airolite, Construction Specialties, Greenheck, and Ruskin, or equal.

2.2 MATERIALS

A. Frame: ASTM B221, 6063-T52 extruded aluminum alloy

B. Fasteners: Aluminum

C. Bird Screen

2.3 EQUIPMENT

A. Blades:

1. Material: ASTM B221, 6063-T52 extruded aluminum alloy

2. Blades shall be of the combination of fixed and adjustable, drainable type with interlocking blade braces to provide an uninterrupted horizontal line.

3. Blades for all louvers shall be minimum 0.081-inch thick.

4. Slideable interlocked mullions shall have provisions for expansion and contraction.

B. Frame:

1. Material: ASTM B221, 6063-T52 extruded aluminum alloy

2. The frame shall be minimum 0.081-inch thick by 4 inches deep.

3. The louver frame shall be assembled by welding.

4. The head, sill, and jamb shall be one-piece structural members and shall have an integral calking slot and retaining bead.

C. Screen:

1. Material: Aluminum wire mesh

2. The louver shall be furnished with a removable bird screen constructed of 1/2-inch mesh, 16-gauge wire and secured within a 10-gauge extruded aluminum frame.

3. The screen shall be mounted on the interior louver face but independent of the louver.

D. Fasteners: Aluminum.

The clear anodized finish specified has good weather and corrosion resistance. Other types of finishes and colors are available from all manufacturers. Edit to fit project.

The Manufacturer's representative should be consulted for applications in highly corrosive environments.

The finish color should be coordinated with the Project Architect.

E. Finish:

1. Unless otherwise specified, all louvers shall receive an AAMA 2605, 70 percent fluoropolymer paint finish after assembly.

2. Minimum coating thickness shall be 0.7-mil.

3. Color to match door.

2.4 FABRICATION

A. General: Fabricate louvers to comply with requirements indicated for design, dimensions, materials, joinery, and performance.

B. Assemble louvers in shop to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

C. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

D. Maintain equal louver blade spacing to produce uniform appearance.

E. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances of louvers, adjoining construction and perimeter sealant joints.

F. Include supports, anchorages and accessories required for complete assembly.

G. Provide vertical mullions of type and at spacing's indicated but not more than recommended by Manufacturer, or 72 inches on center, whichever is less. At horizontal joints between louver units, provide horizontal mullions except where continuous vertical assemblies are indicated.

H. Provide sill extensions and loose sills made of same material as louvers where indicated or required for drainage to exterior and to prevent water penetrating to interior.

I. Join frame members to one another and to fixed louver blades as follows, unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary:

1. With fillet welds, concealed from view.

2. With fillet welds, concealed from view; or mechanical fasteners; or a combination of these methods; as standard with Louver Manufacturer.

PART 3 EXECUTION

3.1 INSTALLATION

A. Locate and place louver units plumb, level, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Form closely fitted joints with exposed connections accurately located and secured.

D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

E. Repair finishes damaged by cutting, welding, soldering, and grinding operations required for fitting and jointing. Restore finishes so there is no evidence of corrective work. Return items that cannot be refinished in the field to the shop, make required alterations and refinish entire unit, or provide new units.

F. Protect nonferrous metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that are in contact with concrete, masonry, or dissimilar metals.

G. Install concealed gaskets, flashings, joint fillers, and insulation, as louver installation progresses, where required to make louver joints weathertight. Comply with Section 07 90 00 for sealants applied during installation of louver.

3.2 FINISHING

A. Adjusting and Protection

1. Protect louvers from damage of any kind during construction period including use of temporary protective coverings where needed and approved by Louver Manufacturer. Remove protective covering at time of Substantial Completion.

2. Restore louvers damaged during installation and construction period, so that no evidence remains of correction work. If results of restoration are unsuccessful, as judged by the Owner's Representative, remove damaged units, and replace with new units.

a. Clean and touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

B. Cleaning

1. Periodically clean exposed surfaces of louvers that are not protected by temporary covering to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.

2. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Rinse surfaces thoroughly and dry.

END OF SECTION