SECTION 08 34 73 – STEEL ACOUSTICAL | RADIO FREQUENCY DOOR ASSEMBLIES

1. GENERAL
	1. section includes
		1. This section includes steel RF Doors and frames for facilities designed to contain radio frequency (RF) energy generated from electronic equipment, and/or shield susceptible equipment from electromagnetic interference.
		2. Krieger door assemblies are ideal for high profile interior applications requiring uncompromised quality, design performance; Research and Development laboratories; computer rooms, healthcare facilities, communication centers, boardrooms and military installations.
		3. Door hardware for specialty STC / RF shielded steel door systems
	2. RELATED sections
		1. Section 08700 - Door Hardware.
		2. Section 09900 - Paints and Coatings.
	3. References
		1. ASTM A 1008 - Standard Specification for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
		2. ASTM A 569 - Standard Specification for Steel, Carbon, (0.15 Maximum Percent), Hot-Rolled Sheet and Strip, Commercial Quality.
		3. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.
		4. ASTM B 117 - Standard Method of Salt Spray (Fog) Testing.
		5. ASTM D 1735 - Standard Practice for Testing Water Resistance of Coating Using Water Fog Apparatus.
		6. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions.
		7. ASTM E 336 - Standard Test Method for Measurement of Airborne Sound Insulation in Buildings.
		8. ASTM E 413 - Classification for Determination of Sound Transmission Class.
		9. HMMA 840 - Installation and Storage of Hollow Metal Doors and Frames; Hollow Metal Manufacturers Association.
		10. ASTM A 240/A240M - Standard Specification for Heat-Resisting Chromium and

 Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.

* 1. System description
		1. Design requirements: Door assemblies to include doors, frames, and door hardware to include gasketing systems, fixed door bottoms, cam-lift hinges, electrified cam-lift hinges and integral 4-sided frame sill for RF as required to achieve specified performance requirements and military installation or wherever TEMPEST and SCIF standards are a requirement.
		2. Performance requirements: Sound Transmission Coefficient rating of STC 50 when tested as operable door assembly in accordance with ASTM E 90 and ASTM E 413. Radio frequency attenuate at least 60 dB of electric field, plane wave and microwave energy from 1 kHz through 18 GHz when tested in accordance with IEEE 299.
		3. Fire-rated assemblies to be tested in accordance with ASTM E 152 (UL 10B) for specified fire resistance ratings, approved by Underwriters Laboratories, Inc., and to bear fire rating seal of that agency.
	2. submittals
		1. Submit under provisions of Section 01300.
		2. Product data: Indicate door materials and construction.
		3. Shop drawings: Indicate door opening criteria, elevations, sizes, types, swings; identify and detail cutouts.
		4. Quality assurance submittals:
			1. Test Reports:
				1. Acoustical 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 (4) FSTC ratings below the specified STC rating.
				3. Radio Frequency Laboratory tested and field verified per NSA 65-6 and MIL-STD-285. IEEE 299 compliant required.
			2. Certificates:
				1. Contractor's certification that:

Products of this section, as provided, meet or exceed specified requirements.

Manufacturer of products of this section meet specified qualifications.

* + - 1. Manufacturer's instructions: Printed installation instructions for each component.
		1. 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.
	1. QUALITY ASSURANCE
		1. Qualifications:
			1. Manufacturer: Minimum five (5) years documented experience producing systems specified in this section.
			2. Installer: Minimum (5) years documented experience installing systems specified in this section, and approved by the manufacturer.
		2. Custom Specification: Conform where applicable to “Guide Specifications for Sound Control Hollow Metal Doors and Frames”, NAAMM Standard HMMA 865-13, member of NAAMM and/or conforms to these standards.
	2. Shielding effectiveness
		1. Krieger doors attenuate at least 60 dB of electric field, plane wave and microwave energy from 1 kHz through 18 GHz. Laboratory tested and field verified per NSA 65-6 and MIL-STD-285. IEEE 299 compliant required.
	3. Delivery, storage and handling
		1. Store frames in accordance with requirements of HMMA 840.
		2. Store steel doors in accordance with requirements of HMMA 840.
		3. 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.
		4. Store units on planks or dunnage in a dry location; store doors in a vertical position spaced by blocking.
		5. Store units covered to protect them from damage, but permitting air circulation.
	4. WARRANTY
		1. Special Warranty: Manufacturer agrees to repair or replace components of sound control door assemblies that fail in materials or workmanship within specified warranty period.
			1. Failures include, but are not limited to, the following:

a. Failure to meet sound rating requirements when door assembly is installed properly and to standards..

b. Faulty operation of sound seals due to seal quality and not seal adjustment.

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

2. Warranty Period: Ten years from date of Substantial Completion.

1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable manufacturer: Krieger Specialty Products, 4880 Gregg Road, Pico Rivera CA 90660; Telephone 562-695-0645.
		2. Substitutions: Not permitted. Or as required by project.
		3. Unless otherwise specified for an individual product or material, supply all products specified in this section from the same manufacturer.
	2. MATERIALS
		1. 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.
			3. Conductive stainless required for RF. Do not paint perimeter contact area. Level, cold rolled sheet steel conforming to ASTM A 240, commercial quality.
		2. Galvannealed steel sheet: ASTM A 653/A 653M, commercial quality, minimum A60 zinc coating.
		3. Acoustical material: Manufacturer's standard for required STC rating.
		4. Primer: Meeting ASTM B 117 salt spray for 150 hours, and ASTM D 1735 water fog test for organic coatings for 200 hours.
	3. COMPONENTS
		1. Steel doors: Fabricate in accordance with Architect-approved shop drawings, 3 inches minimum thickness, and as follows:
			1. Face sheets:
				1. Doors for interior use: Steel sheet, minimum 16 gauge sheet thickness.
				2. Doors for exterior use: Galvanized steel sheet, minimum 16 gauge sheet thickness.
				3. RF Doors: Stainless Steel for grounding. Minimum 16 gauge thick.
				4. Visible seams on face sheets not permitted.
			2. Core:
				1. Stiffen face sheets with steel sections.
				2. Fill spaces between stiffeners with acoustical material.
			3. Vertical edges:

Join face sheets at vertical edges by continuous welding:

Join door faces by continuous weld on each edge, extending full door height.

* + - * 1. Grind, fill, and dress welds to provide smooth flush surface.
				2. Form edge profiles both vertical edges of doors with 1/8 inch in 2 inches bevel.
				3. Visible seams on vertical edges not permitted.
			1. Horizontal edges:
				1. Close top and bottom edges of doors with continuous steel channels, 16 gauge minimum; spot-weld channels to both door faces.
				2. Provide additional flush closing channel at top edge of doors; spot-weld channel to both door faces.
			2. Hardware preparation:
				1. Mortise, reinforce, drill, and tap doors at factory for fully templated mortised hardware only, in accordance with approved hardware schedule and supplied templates.
				2. Provide reinforcing plates at surface-mounted or non-templated hardware locations.
		1. Frames: Fabricate in accordance with Architect-approved shop drawings, and as follows:
			1. Frames for interior use: Fabricate from stainless steel sheet, minimum 14-gauge thickness.
			2. Form frame members straight, and of uniform profile through lengths, as welded units with integral trim, of sizes and profiles indicated.
				1. Weld contact edges of joints closed tight.
				2. 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 gauge as frame, at each joint.
			4. Hardware preparation:
				1. Mortise, reinforce, drill, and tap frames at factory for fully templated mortised hardware only, in accordance with Architect-approved shop drawings and supplied templates.
				2. Provide reinforcing plates at surface-mounted or non-templated hardware locations.
			5. Floor anchors:
				1. Fabricate of same material as frame material; minimum 14 gauge.
				2. Weld anchors inside each jamb for floor anchorage.
			6. Jamb anchors:
				1. Fabricate of same material as frame material; weld anchors inside each jamb for wall anchorage.
				2. Provide anchor types for indicated adjacent wall construction:

Frames for installation in masonry walls: Adjustable jamb anchors, 16 gauge, T-shape type.

Frames for installation in stud partitions: Continuous 16 gauge steel channel to surround stud, welded inside each jamb.

* + - 1. Plaster guards: Fabricate from minimum 22 gauge steel; weld in place at hardware mortises on frames to be set in plaster, masonry, or concrete openings.
			2. Provide welded frames with temporary steel spreader welded to jamb feet for bracing during shipping and handling.
		1. Door hardware: NOTE: FF-L-2890C compliant devices required at SCIF, requires single motion egress. Please contact manufacture to review.
			1. Supply gasketing systems, retainers, retainer covers, fixed door bottoms, and cam-lift hinges as indicated on Architect-approved shop drawings, or specified in manufacturer's product data for project conditions, to achieve specified performance requirements.
			2. Krieger assembly shall be provided with a factory installed RF-tight Monel wire mesh gasket enhanced with flexible, non-woven metallized fabric.
			3. All other door hardware to match as applicable per specified in Section 08710 to achieve performance requirements of the door assembly.
	1. SILL CONDITION
		1. Where indicated on the drawings, furnish a smooth flush stainless steel threshold / sill for the door bottoms to seal against when the door is in the closed position. For openings where carpet extends through the opening, the threshold height shall be 1/8” greater in height than the carpet thickness or as manufacturer requires.
	2. FINISH
		1. Finish: All 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. Prime shall cover all surfaces, except RF contact points.
1. EXECUTION
	1. EXAMINATION
		1. Verification of conditions:
			1. prior to installation, check and correct frames for size, swing, squareness, alignment, twist and plumb.
			2. verify openings are in accordance with approved shop drawings.
		2. Installer's examination:
			1. Have installer of this section examine conditions under which construction activities of this section are to be performed, then submit written notification if such conditions are unacceptable.
			2. Transmit two copies of installer's report to Architect within 24 hours of receipt.
			3. Beginning construction activities of this section before unacceptable conditions have been corrected is prohibited.
			4. Beginning construction activities of this section indicates installer's acceptance of conditions.
	2. PREPARATION
		1. Remove steel spreaders from welded frames prior to installation; use of spreaders for installation purposes not permitted.
	3. INSTALLATION
		1. Install units in accordance with approved shop drawings and manufacturer's printed installation instructions; in addition, install steel components in accordance with HMMA 840.
		2. Fill voids between concealed side of frame and adjacent wall construction with lightweight gypsum plaster in accordance with approved shop drawings or manufacturer's printed installation instructions.
		3. Finish surfaces having abrasion damage smooth; touch-up with rust inhibitive primer.
		4. Install gasketing systems, retainers, retainer covers, fixed door bottoms, cam-lift hinges, thresholds and sills in accordance with manufacturer's printed instructions.

Specifier Note: Verify section references in the following two paragraphs.

* + 1. Installation of all other door hardware is specified in Section 08710.
		2. Field painting is specified in Section 09900.
		3. 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.
	1. FIELD QUALITY CONTROL
		1. Engage and pay for the field services of manufacturer's authorized representative to train, supervise and certify installer ahead of time (preferably before labor begins, at setting of 1st frame, hanging of 1st door and ahead of handover, field testing or the like -- or at least:
			1. Inspect completed installation of door and frame assemblies.
			2. Test all 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.
			6. Instruct Owner's maintenance personnel in correct operation and maintenance procedures for components of door and frame assemblies.
		2. Engage and pay for the services of independent testing agency to:
			1. 1Test 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.
		3. Notify Architect a minimum of four (4) calendar days prior to scheduled testing dates.
	2. maintenance
		1. Instruct the Owner’s Maintenance Personnel regarding the proper operation and maintenance of these doors.

END OF SECTION