

SECTION 13 21 48

MODULAR ACOUSTIC ENCLOSURE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including general and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY:

- A. Modular Acoustic Enclosure field assembled from 4” thick (or 2” thick, refer to plans) pre-manufactured components. Enclosure is designed to meet performance criteria specified herein as a complete assembly.
- B. Provide labor, material, tools, equipment, scaffolding, transportation, inspection, certificates, and temporary protection necessary to:
 - 1. Provide Modular Acoustical Enclosure as shown on Drawings and as specified in these Specifications. Provide accessories and appurtenances required for complete working installation.
 - 2. Connectors and flashing shall make holes in walls acoustically tight in accordance with Enclosure wall manufacturer’s instructions.
- C. Structural steel support frame, if required, to be included by Enclosure manufacturer. Refer to drawings.

1.3 SUBMITTALS:

- A. Product Data: Manufacturer's product specifications.
- B. Shop Drawings: Complete drawings showing components including mechanical and electrical requirements.
- C. Certificate of Compliance: Certify completed assembly meets requirements specified herein.
- D. Submit in accordance with Section 01300.
- E. Stamped (P.E.) calculations for all structural and panel components certifying compliance with roof and /or wind load requirements and California Seismic Zone Requirements (if applicable).

1.4 QUALITY ASSURANCE:

- A. Regulatory Requirements:
 - 1. Acoustical performance: Minimum NRC (Noise Reduction Coefficient) rating of 1.00 and minimum STC (Sound Transmission Class) of 38-54 (refer to drawings for STC requirement) after panel fabrication.

2. Structural Requirements: Design structure to support 30psf dead load. Modular Noise Control Room should be able to support men walking on it but it is not designed for storage unless shown on drawings.
3. Reference Standards:
 - a. ASTM E90-99 or ASTM E90-09 and E413-87 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
 - b. ASTM C423-90A and ASTM E795-00, Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - c. ASTM E336 Sound Transmission Loss in Buildings.
4. All testing shall be performed within the last five (5) years to assure product integrity.

1.5 DELIVERY, STORAGE AND HANDLING:

- A. Deliver products in sufficient quantity and time to maintain approved construction schedule.
- B. Materials shall be in original containers with seals unbroken and labels intact until time of use. Wrapped or bundled materials shall bear name of manufacturer and product. Damaged or otherwise unsuitable material, when so ascertained, shall be removed from Project site.
- C. Store products in secure, dry location, out of way of construction operations. Store products off ground and protect from elements. Wetting of elements not permitted.
- D. Prevent damage to materials, to other stored products, to existing construction, and project work.

1.6 WARRANTY:

- A. Finish warranty: Furnish panel manufacturer's written warranty covering failure of the factory-applied finish on metal panels within the warranty period. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

Warranty Period: 5 years

1.6 ACOUSTICAL PERFORMANCE GUARANTEE:

Provide written guarantee that the assembled MAE will provide a minimum of 35 dBA noise reduction when measured three feet from walls, windows, doors, intake and exhaust silencer openings. If MAE does not achieve the minimum noise reduction performance the MAE supplier is responsible for taking corrective action and the supplier's expense to bring the assembled Enclosure into compliance with Acoustic Performance Guarantee.

1.7 EXPERIENCE:

Enclosure supplier must provide a list of twenty (20) similar successful installations of Modular Acoustic Enclosures supplied within the last five years.

PART 2 – PRODUCTS

2.1 MATERIALS

Modular Acoustic Enclosure shall be constructed of type “**QuietMod**” H/P 38, H/P 42, H/P 44, H/P 50 or H/P 54 Enclosure Panels, STC 51-55 Door Panels, and Window Panels manufactured by **Noise Barriers, LLC.**, Libertyville, IL.

Manufacturer:

Noise Barriers, LLC
2001 Kelly Court
Libertyville, IL 60048

Phone: (847) 843-0500
Fax: (847) 843-0501
www.noisebarriers.com

Contact:

John Finnegan
Email: info@noisebarriers.com

Phone: (315) 682-3821
Fax: (315) 682-3868

2.2 PANEL CONSTRUCTION

- A. Except as shown on drawings or at locations described below, use 2” thick or 4” thick acoustical panels. Exterior surfaces are solid sheet 16-ga. Galvanized steel. Interior surfaces are 22 ga. Perforated galvanized steel.
- B. Sound-retarding and absorbing fill material shall be noncombustible, inert mildew-resistant and vermin proof.
- C. Lateral panel reinforcement, if required, shall be minimum of 18 ga. Cold rolled steel and spaced so vertical span does not exceed 2 ft. – o in.
- D. Spot welds shall be no more than 2 in. apart.
- E. Prior to attaching face sheet, panel shall be dampened and filled with sound-retarding and absorbing elements. Fill shall be slightly larger and thicker than inside dimensions of panel. No voids will be tolerated.
- F. Weld and rivet face sheet to panel assembly to acoustically compress and hold fill materials in place. Panel assembly shall hold fill materials in place under severe conditions of vibration encountered in shipping, installation, and in operation of completed structure.
- G. Acoustic fill material shall be protected by means of a Tape-sealed bag. Bagged fill shall be held back from inside perforated surface by means of an open mesh spacer.
- H. Weep holes to permit water runoff shall be provided on all horizontal surfaces.

2.3 DOOR PANELS

- A. Door leaf shall be STC 50, 51, 52, or 54, 2.5 inches thick or 3.5” thick (refer to drawings for door STC and thickness) fabricated from minimum 12 gauge and 16 gauge steel and filled with sound absorbing and damping elements with a clear opening as shown on the drawings.
- B. Frame shall be fabricated from 14 gauge steel.

- C. Assembly and adjustment of single leaf door, frame, acoustic seals and hinges shall take place at the factory and the entire unit shall ship to the jobsite ready for installation and operation. All doors shall be tested for proper operation in the factory prior to shipment.
- D. Acoustic Seals: Sides and head of door and frame shall receive two (2) sets of self-aligning magnetic-compression seals. Door to be held in place by magnetic force of perimeter seals. Acoustic labyrinth shall be created when door is in closed position. Bottom of door leaf shall contain continuous gravity activated seal, which shall compress against floor as door is closed. Raised sills and threshold drop seals will not be permitted.
- E. Hardware:
 - i) Hinges – minimum of two (2) Cam-Lift hinges finished in US 26-D satin chrome shall be supplied with each door leaf.
 - ii) Pull handles, inside and outside, shall be supplied and installed at the factory.
 - iii) Single leaf doors shall include an LCN 4041 door closer.
 - iv) Double leaf door sets shall include a Dorma Modified Model TS93GSRCONTSN4689 Coordinator.

2.4 WINDOW PANELS

- A. Windows shall be furnished in panels of the type and construction specified as shown on the drawings and panel schedule.
- B. Windows shall consist of two (2) layers (one layer ½” thick, the other layer 3/8” thick) safety glass separated by an air space and sealed in acoustically tight foam rubber seals.
- C. Air space shall contain a desiccant material to prevent fogging.

2.5 PANEL JOINERS AND CONNECTORS

- A. Construct connecting panel joiners of A-60 galvanized steel. Joiner design and fit shall prevent noise leakage while acoustically and structurally joining panels together. Joiners shall be one-piece roll formed sections independent of basic panel so there is no possibility of direct passage of noise.
- B. Joiners and connectors shall be detailed to support loads shown on Drawings. Cam-Lock or interlocking panel joints are not acceptable.

2.6 FINISH PAINT and PACKAGING

- A. Manufacturer's high performance Polyester Powder coating is standard and shall meet warranty requirements.

- B. Apply coatings before, during, or after forming and fabricating panels, as required by coating process and as required for maximum coating performance capability. Fully coat all edges of perforations in face sheet. Protect coating either by application of strippable film or by packing plastic film or other suitable material between panels to protect the finish during shipment.

Color: Architect will select from manufacturer’s standard color chart.

- C. Provide sufficient paint to touch-up panels after installation of MMPR.
- D. All materials shall be shipped in covered wooden crates.

2.7 INTERCHANGEABILITY AND REUSE

- A. Acoustic structural components having same part numbers shall be completely interchangeable.
- B. Acoustic structure shall be such that no components will be damaged upon disassembly. Design shall allow structure to be assembled, disassembled and reassembled minimum of 3 times without detracting from acoustic performance.

2.8 PANEL COMPONENT CHARACTERISTICS

- A. Submit certified laboratory test including absorption and transmission loss values for specified panel type and construction of not less than following:

Sound Transmission Loss, dB

OCTAVE BAND Center Frequencies, HZ	125	250	500	1K	2K	4K	STC
H/P 38 2” thick	24	25	33	43	50	55	38
H/P 42 4” thick	23	31	40	49	56	62	42
H/P 44 4” thick	27	34	41	46	53	59	44
H/P 50 4” thick	29	37	48	56	57	54	50
H/P 52 4” thick	37	43	47	53	54	57	52
H/P 54 4” thick	40	46	51	55	58	62	54

Sound Absorption Coefficients

OCTAVE BAND Center Frequencies, HZ	125	250	500	1K	2K	4K	NRC
H/P 38 2” thick	0.26	0.53	1.00	1.03	0.97	1.02	0.90
H/P 42 4” thick	0.68	1.06	1.12	1.08	1.03	0.98	0.95
H/P 44 4” thick	0.45	0.96	1.15	1.10	1.05	0.97	1.05
H/P 50 4” thick	0.41	0.95	1.23	1.03	1.01	1.01	1.05
H/P 52 4” thick							
H/P 54 4” thick	0.35	0.98	1.23	1.06	1.05	1.03	1.10

- B: Submit certified Fire Testing Laboratory test reports including Flame Spread Index (FSI) and Smoke Developed Index (SDI) values for specified panel type and construction of not less than following:

STC 42 Panel Construction:	FSI 0.00	SDI 0.45
STC 50 Panel Construction:	FSI 0.00	SDI 0.16

PART 3 - EXECUTION

3.1 STRUCTURAL STEEL FRAME (if applicable)

- A. Install columns, roof beams and structural panel support members and anchorage in accordance with AISC Manual of Steel Construction "Code of Standard Practice".
- B. Install panel support members on concrete floor of host building using methods and materials recommended by Enclosure manufacturer.

3.2 ENCLOSURE INSTALLATION

- A. Install MAE panels according to manufacturer's instructions and recommendations, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal and structural movement.
 - 1. Field cutting of panels is not permitted except for necessary cable or electrical penetrations.
 - 2. Install panels with manufacturer's recommended and supplied fasteners.
- B. Accessories: Install components required for a complete acoustical enclosure panel system, including trim, coping, supports and attachments, connections between panels, seam covers, sealants, fillers, closures strips and similar items.

3.3 CLEANING AND ADJUSTMENT

- A. Damaged units: Replace panels and other components of the work that have been damaged or have deteriorated beyond successful repair by means of finish touch up or similar minor repair procedures.
- B. Cleaning: Remove temporary protective coverings and strippable films (if any) as soon as each panel is installed. Upon completion of panel installation, clean finished surfaces as recommended by panel manufacturer, and maintain in a clean condition during construction.

END OF SECTION