

Raleigh Finkelstein Hall
MODULAR AUDIOMETRIC ROOM SUITE

PART 1 – GENERAL

1.1 SUMMARY:

- A. Modular sound conditioned Audiometric Room Suite consisting of a Double Wall Exam Room and a Single Wall Control Room, field assembled from 4” thick pre-manufactured components. Enclosure is designed to meet performance criteria specified herein as a complete assembly. The following components/systems are included and specified herein:
1. Acoustical Modular Audiometric Room Suite.
 2. Sound Control Door and Frame Assemblies.
 3. Sound Control Window Systems.
 4. Acoustic HVAC Silencers.
 5. Flexible Stainless Steel Sprinkler System.
- B. Two room sound suite to include double-walled Exam Room (ER) and single-walled Control Room (CR).
- C. The proposed location is located in the basement of Raleigh Finkelstein Hall located on the GVSU Health Campus in Grand Rapids, Michigan
- D. The existing room is: 15’-0” wide (narrowest point) x 20’-0” long x 9’-0” high (existing ceiling) (333sf). The ADA clear floor areas at the door and sink must remain unobstructed. The existing acoustical ceiling is to remain.
- E. The booth configuration is to fit within the available space provide circulation access and meet the ADA clearances noted above. An approximate minimal booth size is similar to Acoustic Systems RS-252 and RS-257 booths
- F. The booth is to sit directly on the existing concrete floor slab (sheet vinyl floor finish)
- G. Provide labor, material, tools, equipment, scaffolding, transportation, inspection, certificates, and temporary protection necessary to:
1. Provide Modular Audiometric Room Suite 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 Audiometric Room manufacturer’s instructions.

1.3 QUALITY ASSURANCE:

A. Regulatory Requirements:

1. Acoustical performance: Minimum NRC (Noise Reduction Coefficient) rating of 0.95 and minimum STC (Sound Transmission Class) of 44 after panel fabrication.
2. Reference Standards:
 - a. ASTM E90-99 or ASTM E90-02 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.

1.4 SUBMITTALS:

- A. Product Data: Manufacturer's product specifications, data sheets, approval/installation drawings and manual, maintenance procedures.
- B. Shop Drawings: Complete drawings showing plans and elevations, construction details, and interface with host building including mechanical and electrical requirements. Include seismic bracing and fastening requirements if required by local codes.
- C. Certificate of Compliance: Certify completed assembly meets requirements specified herein. Include test reports on components from an independent NVLAP accredited test facility.
- D. Color samples for each Audiometric Room.

1.5 DELIVERY, STORAGE AND HANDLING:

- A. Providing for the manufacturer's given lead times 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. Unload materials upon arrival, inspect for freight damage. Notify manufacturer immediately of freight damage or missing materials.

- D. 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.
- E. Prevent damage to materials, to other stored products, to existing construction, and project work.

1.6 WARRANTY:

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

PART 2 – PRODUCTS

2.1 MATERIALS:

- A. Provide the following:
 - Conceptual layout for approval prior to shop drawings
 - Field Verify Existing Conditions prior to fabrication
- B. Modular Audiometric Room Suite shall be installed where shown on the attached plan and specified herein.

2.2 PANEL CONSTRUCTION

- A. Except as shown on Drawings or at locations described below, use 4” thick acoustical panels. Exterior surfaces are solid sheet 16-gauge A-60 Galvanealled steel. Interior surfaces are 16-gauge A-60 Galvanealled perforated steel.
- B. Sound-retarding and absorbing fill material shall be noncombustible, inert mildew-resistant and vermin proof.
- C. Internal lateral panel reinforcement stiffeners shall not be allowed on wall panels.
- 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. Perforated metal surfaces to receive field finish paint to have metal mesh spacer between acoustic fill and perforated face.
- H. Audiometric room supplier to provide all necessary 16 gauge minimum solid flashing between side walls and host building and top of rooms and existing ceiling. Fascia shall be painted to match wall panels.
- I. Combustion Ratings

The panel modules shall meet the requirements of Class A materials established by ASTM E-84-06. The panels shall not exceed the following limits:

- a. Flame spread Classification: Less than 5
- b. Smoke Developed: Less than 50

2.3 DOOR PANELS:

- A. Door leaf shall be 2.5 in. thick fabricated from 14-gauge steel and filled with sound absorbing and damping elements with a clear opening of 35" x 74" high, STC 45 minimum with a 22" x 60" double glazed window using one layer of 1/2" and one layer of 3/8" thick safety glass.
- B. Frame shall be fabricated from 14-gauge steel.
- C. Assembly and adjustment of single and double leaf doors, frames, 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. All hardware should be supplied by and factory installed by the sound door manufacturer.
- 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 the 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. Glazed doors shall be factory glazed by the sound door manufacturer with two layers of laminated safety glass, one layer shall be 1/2" the other layer shall be 3/8" thick safety glass.

F. Hardware:

- i) Hinges – two (2) Cam-Lift hinges finished in US 26-D satin chrome shall be supplied with each door leaf.
- ii) Latches shall not be required to hold the door closed or to achieve acoustic seal.
- iii) Pull handles, inside and outside, shall be supplied and installed at the factory.
- iv) Refer to the door schedule for additional hardware.

2.4 WINDOW PANELS:

- A. Windows shall be factory glazed in panels of the type and construction specified as shown on the drawings and window schedule.
- B. Windows shall consist of one layer of ½” and one layer of 3/8” thick safety glass separated by an air space and sealed in acoustic gaskets and match acoustic performance of the walls and/or door.
- C. Window shall be tinted to function as one-way glass
- D. Air space shall contain a desiccant material to prevent fogging.
- E. The window size shall be a maximum size of not be less than 72” wide x 36” high. Window length to be verified with booth layout

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 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.

2.6 FINISH PAINT:

- A. Metal surfaces to receive paint shall be degreased and cleaned with welds ground smooth and filled as needed.
- B. Finish paint to be factory applied TGIC polyester powder coating, minimum 3 mils thick. Color for walls to be any single color per room selected by purchaser from standard RAL color chart.

- C. Color for the ceiling panels shall be RAL 9003 White, no exceptions.
- D. Provide sufficient paint to touch-up panels after installation of wall.

2.7 INTERIOR ENHANCEMENT PACKAGE:

A: The interior walls of both the Exam Room and the Control Room shall be treated with floor to ceiling, magnetically mounted, 1” thick fabric wrapped panels using with chemically hardened square edges, and LA fabric type G polyester fabric.

B: All electrical boxes shall include 1” thick extension rings to bring the electric box flush with the face surface of the fabric panel.

2.8 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.

2.9 PANEL COMPONENT ACOUSTIC CHARACTERISTICS:

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

B. Rooms used for audiometric testing shall not have background sound pressure levels exceeding those in Table 1 listed below

TABLE 1. Maximum permissible ambient noise levels in octave band intervals centered at 125-8,000 Hz for ears-covered and ears-not-covered test conditions and test frequency ranges 125-8,000 Hz, 250-8,000 Hz, and 500-8,000 Hz as specified in ANSI S3.1-1991. Tabled values in dB (re: 20 μ Pa) rounded to the nearest 0.5 dB.

Octave Band Intervals	Ears Covered			Ears Not Covered		
	125-8000 Hz	250-8000 Hz	500-8000 Hz	125-8000 Hz	250-8000 Hz	500-8000 Hz
125	34.0	36.5	47.5	28.0	32.5	42.5
250	22.5	22.5	33.5	18.5	18.5	28.5
500	19.5	19.5	19.5	14.5	14.5	14.5
750	21.5	21.5	21.5	12.5	12.5	12.5
1000	26.5	26.5	26.5	14.0	14.0	14.0
1500	26.5	26.5	26.5	10.5	10.5	10.5
2000	28.0	28.0	28.0	8.5	8.5	8.5
3000	33.5	33.5	33.5	8.5	8.5	8.5
4000	34.5	34.5	34.5	9.0	9.0	9.0
6000	38.0	38.0	38.0	14.0	14.0	14.0
8000	43.5	43.5	43.5	20.5	20.5	20.5

2.10 PERFORMANCE CHARACTERISTICS:

A: Airborne Noise Reduction shall meet: NIC 50 from exterior to interior of module per ASTM E-596 and NIC 69 from interior of one module to interior of adjacent module with a 4” airspace between modules per ASTM E336. Bid must include In-Situ testing showing these values.

B: Completed suite, both the Exam Room and the Control Room, shall meet or exceed the ANSI S3.1 standard for Permissible Noise Levels.

2.11 ELECTRICAL:

- A. The wall and ceiling panels shall be supplied with thin-wall conduit and outlet boxes “buried” in the wall in locations shown on the plans.
- B. All “buried” conduit to be minimum 1” diameter.
- C. Each room shall include two (2) open outlet box and conduit in each wall for data feed by others.

- D. Each room shall include a minimum of eight (8) LED flush mounted light fixtures with dimmers. The main dimmer to control both rooms shall be located in the Control Room and a separate dimmer in the Patient room.
- E. “Plug and play” electrical: Pre-wired, UL Listed electrical system consists of duplex outlets...two (2) per wall, two (2) per ceiling and light switch with dimmer in each room.
- F. Each room shall include a buried outlet with buried conduit it to house a thermostat supplied by other.
- G. Each room will include two connections for video monitors and two connections for cameras.
- H. There shall be a jack panel in each booth between the control side and the test side of the booth. Jack panel shall include ten (10) ¼” stereo ports and two (2) USB ports.
- I. There shall be visual strobe included in the control room and exam side of the booth and tied into the fire alarm system for the building. The booth installation is in the Audiology contract and needs to be coordinated with that contractor. The specification for the strobe is:
 - a. Strobes: shall match existing building system.
 - b. Xenon flash tube type 75 candela in all other areas with a flash rate of 1 HZ.
 - c. Strobes shall be synchronized where required by the National Fire Alarm Code (NFPA72).
 - d. Back plate shall be red with 13mm (1/2 inch) permanent red letters. Lettering to read “Fire”, be oriented on the wall or ceiling properly, and be visible from all viewing directions.
 - e. Each strobe circuit shall have a minimum of twenty (20) percent spare capacity.
 - f. Strobes may be combined with the audible notification appliances specified herein.

2.12 SILENCED HVAC SYSTEM:

A: Provide Modular Audiometric Room Suite with silenced ventilation system designed to be connected to building HVAC system. Each room shall have a separate system for supply and return air.

B: Equip each room with roof top silencers with minimum 6" diameter x 1" duct ring connection points to be used for connection to building HVAC system by others.

C: Ventilation silencers shall be ceiling mounted and designed with minimum airflow rate that will allow for one complete air change every 10 minutes and a pressure drops that do not exceed .025 inches of water at an airflow rate corresponding to one complete air change every 10 minutes.

D: Provide empty conduit and box in each room adjacent to door to accept thermostat by others.

E: Provide rooms with diffusers and registers as required for supply and return air. Provide each room with a thermostat

2.13 FIRE SPRINKLERS:

A: The ceiling of each room shall be equipped with a factory installed Flexible Stainless Steel Sprinkler Drop System consisting of braided type 304 stainless steel flexible tube, a zinc plated steel 1" NPT Male threaded nipple for connection to branch line piping and a zinc plated steel reducer with a 1/2" or 3/4" NPT female thread for connection to the sprinkler.

B: The braided drop system shall be UL listed and FM approved for sprinkler services to 175psi.

C: The Stainless-Steel hose length shall be a minimum of 72".

D: The drop shall include a UL-2443 approved and FM-1637 listed Series AH2 braided hose with a bend radius to 2" to allow for proper installation in confined spaces.

E: The final connection from the Suite to the host building shall be by others.

III. PART 3 - EXECUTION

3.1 INSTALLATION:

A. Install Modular Audiometric Room Suite 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.

Field cutting of panels is not permitted.

- 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.

3.2 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