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ARIA™ ACOUSTICAL SHELL

PART 1-GENERAL

1.1 SUMMARY

A. This specification section includes the engineering, fabrication, furnishing, delivery and installation of new acoustical shell system as specified.

B. The full stage acoustical shell shall consist of a system of acoustical panels of appropriate construction to reflect and transmit a maximum range of audible frequencies and adjustable to proper positions.

C. Ceiling panels shall be tested for sound absorption and sound transmission. Testing shall be performed by an IAS accredited testing agency.

1. Provide acoustical ceiling system comprised of ceiling panels having the following sound transmission requirements:

a. Sound Transmission Class (STC): Minimum 24 per ASTM E 413.

1.2 SCOPE OF WORK

A. Comply with International Building Code, Edition based jurisdiction.

B. Work under this section consists of the fabrication of new equipment and installation of a new acoustical shell. Work shall include the installation of all materials and equipment necessary for the proper operation of the orchestra shell.

C. Preparation and submission of complete engineered shop drawings for approval.

D. Submission of required record documents.

E. Coordination with other affected work, trades and inspections.

F. Final assembly of components to provide a complete, operable system.

1.3 REFERENCES

A. Aluminum Association (AA):

1. AA Standard AA-M12C22A41.
2. AA Standard AA-M12C22A42/44.

B. American Institute of Steel Construction (AISC):

1. AISC Manual of Steel Construction.

C. American Plywood Association (APA)
1. US. Product Standard PS 1-83

D. American Society for Testing and Materials (ASTM):
1. ASTM A36: Standard Specification for Structural Steel.
2. ASTM A283: Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
3. ASTM A307: Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
4. ASTM A325: Standard Specification for High-Strength Bolts for Structural Steel Joints.
5. ASTM A500: Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
6. ASTM A501: Standard Specifications for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
7. ASTM A570: Standard Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.
8. ASTM B209: Standard Specification for Aluminum-Alloy Sheet and Plate.

E. American Welding Society (AWS):
1. AWS D1.1 Structural Welding Code-Steel.
2. AWS D1.3 Structural Welding Code-Sheet Steel, Second Edition.

F. Americans with Disabilities Act (ADA)

1.4 RELATED SECTIONS

A. 09 90 00 Painting and Coating

B. 11 61 33 Rigging Systems and Controls- For rigging requirements for the attachment and support of the acoustical shell ceilings.

C. 26 55 61 Theatrical Lighting- For electrical requirements for the lighting components of the acoustical shell ceilings.

1.5 SUBMITTALS

A. Ceiling product Data: Provide third party acoustical test data sheets for ceiling panels.
1. Provide test results by certified independent testing laboratory with IAS accreditation (International Accreditation Service, Inc.), indicating compliance with performance requirements.

B. Shop Drawings: Prepared by Staging Concepts. Include dimensioned plans, sections and elevations showing acoustical shell system layout, component sizes and details of each condition of the shell system.
1. Include fabrication and installation details.

C. Samples: If requested, Staging Concepts shall submit a sample of a typical shell panel and framework construction.

E. Contract Closeout Submittals: Comply with Section 01 70 00 Execution and Closeout Requirements.
1. Project record documents
2. Operating and maintenance manuals.

1.6 WARRANTY

A. Special Warranty: Staging Concepts written warranty indicating Staging Concepts intent to repair or replace acoustical shell system components that fail in materials or workmanship within five (5) years from the date of substantial completion. Failures are defined to include, but are not limited to the following:

1. Fracturing or breaking of unit components which results from normal wear and tear and normal use other than vandalism.
2. Delamination or other failures of glue bond of components.
3. Warping of components not resulting from leaks, flooding, or other uncontrolled moisture or humidity.

PART 2- PRODUCTS

2.1 MANUFACTURER

A. Basis of design: Acoustical shell system design is based upon the Aria™ Acoustical Shell.

1. Staging Concepts. 8400 Wyoming Ave. North, Suite 100, Minneapolis, MN 55445. 763-533-2094 www.stagingconcepts.com

2.2 MATERIALS

A. Aluminum extruded bars, profiles and tubes: ASTM B 221 (ASTM B 221M), 6005-T5 alloy.

B. Steel tube: ASTM A 501, hot formed steel tubing

C. Cold-rolled steel sheet: ASTM A 1008/A 1008M, commercial steel, type B.

D. Medium Density Fiberboard: 3/16 inch (4 millimeters) ANSI A208.2, CARB-2.

E. High-Pressure Laminate (HPL): NEMA LD 3, Grade VGS.

F. Veneer-faced panel products (MDF core): AWI Premium Grade Hardboard meets all CARB-2 requirements for formaldehyde emissions.

2.3 COMPONENTS

A. Panel Construction:

1. General: Staging Concepts standard stressed-skin laminated composite acoustical shell panel designed to absorb and transmit sound and reflect a range of audible frequencies for maximum performance and maximum audible audience range.
    a. Ceiling Core; 1 ½ inch thick (38 millimeters) phenolic impregnated honeycomb core material.
    b. Tower Core; 1 inch thick (26 millimeters) phenolic impregnated honeycomb core material.
2. Ceiling Core; 1 ½ inch thick (38 millimeters) phenolic impregnated honeycomb core material, Tower Core; 1 inch thick (26 millimeters) phenolic impregnated honeycomb core material, (3/8-60-60-15%) shall have an open geometric pattern with cell walls vertical to panel skins and defined by alternating straight and sine wave layers. Height of sine wave shall be 3/8 inches (10 millimeters). Panel wall thickness shall correspond to 60 pound (22.40 kilogram) kraft. Bonding of core material to panel faces shall be with permanently cured polyurethane adhesive. Foam core materials and contact adhesives shall not be permitted.

3. Face Finish Options:
    a. Medium Density Fiberboard: exposed faces shall be 3/16 inch (4 millimeters) thick stressed skin, material and finish as indicated, with no exposed fasteners. Painted finish selected by the owner, architect or consultant.
    b. High Pressure Laminate (HPL): Material and finish as indicated with no exposed fasteners. Color as selected by the owner, architect or consultant.
    c. Wood Veneer: AWI premium grade hardwood plywood veneer, species as specified by the owner, architect or consultant. Slip-matched and balance matched within panel face. Species and finish selected by the owner, architect or consultant.
4. Back; 3/16 inch (4 millimeters) thick stressed skin. Rear face shall be painted matte black for painted panels. High pressure laminate panels shall have black laminate on the back skin to balance the panel.
5. Panel edge frame; Extruded aluminum edge angle on straight sides of panel.
6. Ceiling Base panel weight is approximately 2.7 pounds per square foot (13.2 kilograms per square meter).
7. Tower Base panel weight is approximately 2.2 pounds per square foot (10.8 kilograms per square meter).

B. Acoustical shell towers:
1. Tower frame: Extruded 6005-T5 aluminum alloy vertical tower frames.
2. Transport and storage- Tower frames include locking casters. A T-handle is provided to be inserted into the base of each tower for easy transport.
3. Shell tower size and configuration: Standard towers are 8 feet wide with standard heights: 16 foot (4.9 m), 17 foot (5.2 m), 18 foot (5.5 m), 19 foot (5.8 m) and 20 foot (6.1 m).
4. Shell tower radius: 10-foot (3 m) standard.
5. Tower Panel face finish:
    a. Painted MDF
    b. High Pressure Laminate

C. Adjustable acoustical shell ceiling: Acoustical shell ceiling consisting of adjustable-angle acoustical cell ceiling panels supported by integral extruded aluminum truss. The shell ceiling to be suspended from stage rigging truss battens. Ceiling to be stored in fly-loft in vertical position as indicated. Storage carts provided upon request.
1. Ceiling Panel size and configuration: as indicated
2. Ceiling Panel radius: 5-foot (1524 millimeters), 10-foot (3048 millimeters) and 20-foot (6096 millimeters) Standard. Custom radius curves available upon request.
3. Ceiling Panel face finish:
    a. Painted MDF
    b. High Pressure Laminate
4. Panel hinges: Aluminum, with self-lubricating bearings.

D. Stage rigging and battens: Rigging and battens supporting acoustical shell ceiling shall be provided by others per specifications.

E. Integrated Lighting: Staging Concepts standard UL-approved fixtures located as indicated. Final approved lighting to be chosen by the architect, theatre consultant or engineer.

1. UL listed connector strip that attached to ceiling set as indicated on the drawings. Provide circuits as indicated wired to location as indicated on the drawings for connection by others.
2. A mechanical tilt switch is provided with each light fixture to prevent accidental activation when the ceiling row is in the storage position.
3. Lighting options:
    a. ETC Source Four PAR MCM
    b. ETC Source Four PAR EA
    c. ETC Desire D40 LED series
    d. ColorSource PAR LED
    e. Additional lighting options upon request.

2.4 OPTIONS

A. Doors: Entrance doors can be provided for access to the stage and equipment.
    1. Hinges: Steel surface-mount piano hinges run the entire height of the door.
        a. Standard Color: Black
        b. Slide-lock mechanism to lock door and pull handle.

2.5 FINISHES

A. Aluminum Framing: Mill Finish.

B. Panel face finish as determined by the architect.

PART 3- EXECUTION

3.1 SITE INSPECTION

A. Examine jobsite conditions for compliance with requirements for the installation tolerances, including required overhead clearances, and other existing conditions affecting installation and performance of acoustical shells. Proceed with unit installation upon correction of unsatisfactory conditions.

3.2 DELIVERY, STORAGE AND HANDLING

A. Packing and Shipping: Deliver products in original unopened packaging as applicable, with legible manufacturer's identification.

B. Storage and Protection: Comply with manufacturer's recommendations.
    1. Store in a cool, dry place out of direct sunlight.
    2. Protect from the elements and from damage.

3.3 ACOUSTICAL SHELL TOWER INSTALLATION

A. Erect acoustical shell towers in location indicated in coordination with Owner's personnel to verify components are complete and operational.

3.4 ACOUSTICAL SHELL CEILING INSTALLATION

A. Install acoustical shell ceiling units plumb, level and true, in accordance with Staging Concepts recommendations and approved submittals. Suspend from stage rigging using specified installation accessories.

1. Verify setting of units in performance and storage positions
2. Verify adjustability of units.
3. Install and test integral lighting.

3.5 CLEANING

A. Clean exposed surfaces of acoustical shells. Comply with Staging Concepts written instructions for cleaning and touchup of minor finish damage.

B. Repair or replace defective work as directed by the architect upon inspection.

3.6 TRAINING AND DEMONSTRATION

A. Train Owner's personnel to assemble, adjust, operate and maintain acoustical shell towers and acoustical shell ceiling units.

END OF SECTION 11 61 13