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This MANU-SPEC® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat™*, *SectionFormat™* and *PageFormat™*. A MANU-SPEC is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate product model numbers, styles and types are used in Specifier Notes and in the specification text Article titled "Acceptable Material." Metric conversion, where used, is soft metric conversion.

This MANU-SPEC specifies reflector panels, absorber panels, and diffuser panels as manufactured by ESSI Acoustical Products, Inc. Revise MANU-SPEC section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat* for other section numbers and titles.

SECTION 09 84 00 ACOUSTIC ROOM COMPONENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: This Section specifies reflector panels, absorber panels, and diffuser panels.

Specifier Note: Revise Paragraph below to suit project requirements. Add section numbers and titles per CSI MasterFormat and specifier=s practice.

- B. Related Requirements:

Specifier Note: Include in this Paragraph only those sections and documents that directly affect the work of this section. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the Subparagraph below. Do not include Division 00 documents or Division 01 sections since it is assumed that all technical sections are related to all project Division 00 documents and Division 01 sections to some degree. Refer to other documents with caution since referencing them may cause them to be considered part of the Contract.

1. Section 09 51 00 Acoustical Ceilings: Lay-in acoustical ceiling grid.
2. Section [_____].

1.02 REFERENCES

Specifier Note: Paragraph below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain References Paragraph when specifying products and installation by an industry reference standard. List retained standard(s) referenced in this section alphabetically. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Contract Conditions Section 01 42 00 - References may establish the edition date of standards. This Paragraph does not require compliance with standard(s). It is a listing of all references used in this section. Only include here standards that are referenced in the body of the specification in PARTS 1, 2 and/or 3. Do not include references to building codes at any level.

- A. Reference Standards:

1. STM International (ASTM):
 - a. ASTM C423 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - b. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - c. ASTM E795 Standard Practices for Mounting Test Specimens During Sound Absorption Tests.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate work of this Section with work of other trades for proper time and sequence to avoid construction delays. Comply with Section [01 31 00 - Project Management and Coordination].

Specifier Note: Add additional text to specify unusual or detailed coordination requirements affecting the work results of this Section.

1. [_____].

- B. Preinstallation Meetings: Conduct preinstallation meeting [one week] prior to commencing [work of this Section] [and] [on-site installations] to verify project requirements, substrate conditions and coordination with other building subtrades, and to review manufacturer=s installation instructions and manufacturer=s warranty requirements. Comply with Section [01 31 19 - Project Meetings].

Specifier Note: Add additional text to describe requirements for meetings to coordinate products and techniques and to sequence related work for sensitive and complex items.

1. [_____].

- C. Sequencing: Sequence work of this section in accordance with Section [01 12 16 - Work Sequence] [and manufacturer=s written recommendations for sequencing construction operations].

Specifier Note: Specify additional text as required to describe the particular sequence of events required to coordinate work that must be done in sequence with, or at the same time as, work in another section.

1. [_____].

- D. Scheduling: Schedule work of this Section in accordance with Section [01 32 13 - Scheduling of Work].

Specifier Note: Specify additional text to include requirements for coordinating work that requires unusual scheduling with work of other sections.

1. [_____].

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect=s and Contractor=s duties and responsibilities in Contract Conditions and Section 01 33 00 - Submittal Procedures.

1.04 ACTION SUBMITTALS

- A. General: Submit listed submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- B. Product Data: Submit specified products as follows:
 1. Manufacturer's product data, including manufacturer=s SPEC-DATA product sheet.
 2. Catalog pages illustrating products to be incorporated into project.
 3. Material Safety Data Sheets (MSDS).
- C. Shop Drawings: Indicate information on shop drawings as follows:
 1. Reflected ceiling plans and elevations showing layout of acoustic panels and their relationship to adjacent building components.
 2. Mounting details.

Specifier Note: Samples are full-size actual products intended to illustrate the products to be incorporated into the project. Sample submittals are commonly necessary for such characteristics as colors, textures, and other appearance issues.

- D. Samples: Submit as follows:

1. Example: [Full size] [___ inches x ___ inches (___ x ___ mm)] samples of [_____].

Specifier Note: Use the following Paragraph when high value samples are submitted.

2. [_____] [Owner] [Architect] [Consultant] will return samples to Contractor for incorporation in work.

1.05 INFORMATION SUBMITTALS

Specifier Note: Specify submittal of test reports or evaluation service reports intended to document required tests without repeating the test requirements specified in Division 01.

- A. General: Submit listed submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- B. Test and Evaluation Reports:
 - 1. Certified test reports showing compliance with specified performance characteristics and physical properties.

Specifier Note: Specify submittals intended to document manufacturer installation, storage and other instructions.

- C. Manufacturer=s Instructions: Submit manufacturer=s storage and installation instructions.
- D. Source Quality Control: Submit documentation verifying that components and materials specified in this Section are from single manufacturer.

Specifier Note: Coordinate with Field Quality Control in PART 3. When manufacturer=s services are specified during construction operations to verify installation, include following Paragraph for the submittal of instructions and reports. If no field inspections are required, delete the following Paragraph.

- E. Manufacturer's Reports: Manufacturer=s field reports specified.
- F. Qualification Statements:
 - 1. Submit letter of verification for Manufacturer=s Qualifications.
 - 2. Submit letter of verification for Installer=s Qualifications.

1.06 CLOSEOUT SUBMITTALS

- A. General: Submit listed submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- B. Operation and Maintenance Data:
 - 1. Submit operation and maintenance data for installed products in accordance with Section [01 78 23 - Operation and Maintenance Data]. Include:

Specifier Note: Edit or expand list of operation and maintenance data submittal inclusions to suit project requirements.

- a. Manufacturer=s instructions detailing maintenance requirements.
- b. Parts catalog giving showing complete list of available parts.
- c. Replacement parts with cuts and identifying numbers.
- C. Warranty Documentation: Submit warranty documents specified.

1.07 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer:
 - a. 5 years experience manufacturing components similar to or exceeding requirements of project.
 - b. Having sufficient capacity to produce and deliver required materials without causing delay in work.
 - c. Capable of providing field service representation during construction.
 - 2. Installer: Acceptable to the manufacturer, experienced in performing work of this section and has specialized in installation of work similar to that required for this project.

Specifier Note: Retain the following Paragraph when certification related to sustainability submittals is a project requirement.

- B. Sustainability Standards Certification: Provide certification for [_____] materials certified by [certification organization's name] in accordance with [certification organizations standard].

Specifier Note: If a mock-up is required, retain Paragraph below.

- C. Mock-Up: Construct mock-up where [indicated] [directed] by [Owner] [Architect] [Consultant] in accordance with Section [01 43 00 - Quality Assurance].
 - 1. Construct showing [section subject matter] work.
 - 2. Dimensions and Process: Construct to [___ feet x ___ feet (___ x ___ m)] using proposed procedures, colors, textures, finishes and quality of work.
 - 3. Purpose: To judge quality of work, substrate preparation, operation of equipment and material application.

4. Locate [where directed] [where indicated].
5. Do not proceed with work prior to receipt of written acceptance of mock-up.
6. When accepted, mock-up will demonstrate minimum standard of quality required for this work. [Approved mock-up may [not] remain part of finished work.] [Remove mock-up and dispose of materials when no longer required and when directed by [Owner] [Architect] [Consultant].]

1.08 DELIVERY, STORAGE & HANDLING

A. Delivery and Acceptance Requirements:

1. Deliver material in accordance with Section [01 61 00 - Common Product Requirements] and in accordance with manufacturer=s written instructions.
2. Deliver materials in manufacturer=s original packaging with identification labels intact and in sizes to suit project.

B. Storage and Handling Requirements:

1. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

C. Packaging Waste Management:

Specifier Note: The disposal of packaging waste into landfill sites demonstrates an inefficient use of natural resources and consumes valuable landfill space. Specifying appropriate packaging and construction waste management and disposal procedures may contribute to points required for USGBC=s LEED® construction project certification.

Specifier Note: Include the following Subparagraphs to specify information that will provide direction to the Contractor for the disposal of construction waste materials using environmentally responsible methodology other than landfill resources.

1. Separate waste materials for [reuse] [and] [recycling] in accordance with [Section 01 74 19 - Construction Waste Management and Disposal].

Specifier Note: USGBC=s LEED® certification includes credits for the diversion of construction waste from landfill. Diversion can be tracked by either weight or volume but must be consistent for all materials. Manufacturer may reclaim packaging and delivery materials for recycling.

2. Remove packaging materials from site and dispose of at appropriate recycling facilities.
3. Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate onsite bins] for recycling.
4. Fold metal and plastic banding, flatten and place in designated area for recycling.

Specifier Note: Add additional Subparagraphs to include pallets, crates, padding and other packing materials that are typically associated with the specified products.

5. Remove:
 - a. Pallets from site [and return to supplier or manufacturer].
 - b. [_____].

PART 2 PRODUCTS

Specifier Note: Retain Article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as Aor equal,@ “or approved equal@ or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining Aor equal@ products.

2.01 ACOUSTIC PANELS

Specifier Note: Include in the following Paragraph manufacturer=s name, address, phone number, fax number, e-mail address and website URL.

A. Manufacturer: ESSI Acoustical Products, Inc.

1. Contact: 10271 Berea Road, PO Box 643, Cleveland, OH 44111; Phone: 800-886-6678, Phone: 216-251-7888, Fax: 216-251-9933; E-mail: info@essiacoustical.com; Website: www.essiacoustical.com.

Specifier Note: Substitution procedures must either be in the Contract Conditions or in Section 01 25 00 - Substitution Procedures. Do not include substitution procedures here.

2. Single Source Responsibility: Provide components and materials specified in this section from a single manufacturer.
3. Substitution Limitations:
 - a. Substitutions: [In accordance with [Contract Conditions] [Section 01 25 00 - Substitution Procedures] [No substitutions permitted].

Specifier Note: Include an overall description of the system, assembly, product or material. Include required properties or characteristics that do not obviously belong under other titles. Examples: Configuration, size and color.

B. Description:

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Contract Conditions and Section 01 41 00 - Regulatory Requirements. Repetitive statements should be avoided.

1. Regulatory Requirements:
 - a. In accordance with Section [01 41 00 - Regulatory Requirements].
 - b. [_____].
2. Sustainability Characteristics:
 - a. [_____].
3. Compatibility:
 - a. Ensure components and materials are compatible with specified accessories and adjacent materials.

Specifier Note: Performance characteristics are usually stated with some form of evaluation or verification. Performance usually, but not universally, applies to systems and assemblies. Performance criteria can include structural, safety, fire resistance, vapor retardancy, acoustical, thermal, operational capacity and durability.

C. Performance Criteria:

Specifier Note: Retain paragraph(s) below to comply with finishes specified.

1. Surface Burning Characteristics (ASTM E84):
 - a. Fabric Covered Panels:
 - 1) Flame Spread: Not more than 25.
 - 2) Smoke Developed: Not more than 105.
 - b. Vinyl Covered Panels:
 - 1) Flame Spread: Not more than 25.
 - 2) Smoke Developed: Not more than 40.

Specifier Note: Select panels, models, sizes below with options, finish(es), and mounting methods to conform to project requirements. If several panels are retained, consider creating designators. Coordinate with drawings.

D. ESSI Radial Reflector Panel:

1. Model and Size: [R3.44, 40 x 48 inches (1016 x 1219 mm)] [R44, 48 x 48 inches (1219 x 1219 mm)] [R4.94, 57 x 48 inches (1447 x 1219 mm)] [R64, 72 x 48 inches (1828.8 x 1219 mm)] [R74, 2133 x 1219 mm] [R84, 96 x 48 inches (2434 x 1219 mm)] [R104, 120 x 48 inches (3048 x 1219 mm)] [R63, 72 x 36 inches (1828.8 x 914.4 mm)] [R73, 84 x 36 (2133.6 x 914.4 mm)].
2. Panel Radius: 10 feet.
3. NRC Range (ASTM C423 and E795): 0.20 to 0.05.
4. Internal Absorber: [Internal absorber (IA)] [Internal liner (IL)].
5. Finish: [White gel coat] [Paintable gel coat] [Fabric].
6. Mounting: [Hanging Brackets on back of unit provides three-point trapeze suspension] [As indicated].

E. ESSI Flat Reflector Panel:

1. Model and Size: [R44, 48 x 48 inches (1219 x 1219 mm)] [R84, 96 x 48 inches (2434 x 1219 mm)].
2. NRC Range (ASTM C423 and E795): 0.20 to 0.05.
3. Internal Absorber: [Internal absorber (IA)] [Internal liner (IL)].
4. Finish: [White gel coat] [Paintable gel coat] [Fabric].
5. Mounting: [Hanging Brackets on back of unit provides three-point trapeze suspension] [As indicated].

F. ESSI Absorber Panel:

Specifier Note: Available in size(s) up to 48 x 120 inches (1219 x 3048 mm)

1. Model and Size: W106, [_____].
2. Thickness: [1] [2] [3] [4] inches.

Specifier Note: NRC depends on the thickness specified, see SPEC-DATA sheet.

3. NRC (ASTM C423 and E795): [_____], minimum.
 4. Edge Profile: [Square] [Radius] [Bevel] [As indicated].
 5. Corners: [Square] [Radius] [As indicated].
 6. Edge Treatment: [Chemically hardened] [_____].
 7. Finish: [Manufacturer's standard fabric] [Customer's own material] [_____].
 - a. Color: [_____] [As selected].
 8. Mounting: [Adhesive] [Mechanical clip] [Impaling clip and adhesive] [Hook and loop] [As indicated].
- G. ESSI Barrel Shaped Diffuser Panel (Radius on Short Dimension):
1. Model and Size: [D12x22, 12 x 22 x 7 inches (304.8 x 558.8 x 177.8 mm)] [D1.49, 16 x 108 x 7 inches (406.4 x 2743.2 x 177.8 mm)] [D22, 23 x 23 x 7 inches (584.2 x 584.2 x 177.8 mm)] [D24, 23 x 47 x 7 inches (584.2 x 1193.8 x 177.8 mm)] [D26, 23 x 71 x 7 inches (584.2 x 1803.4 x 177.8 mm)] [D33, 35 x 35 x 7 inches (889 x 889 x 177.8 mm)] [D35, 35 x 47 x 7 inches (889 x 1193.8 x 177.8 mm)] [D35, 35 x 59 x 7 inches (889 x 1498.6 x 177.8 mm)] [D36, 35 x 71 x 7 inches (889 x 1803.4 x 177.8 mm)] [D44, 47 x 47 x 7 inches (1193.8 x 1193.8 x 177.8 mm)] [D45, 47 x 59 x 7 inches (1193.8 x 1498.6 x 177.8 mm)] [D46, 47 x 71 x 7 inches (1193.8 x 1803.4 x 177.8 mm)] [D48, 47 x 95 x 7 inches (1193.8 x 2413 x 177.8 mm)].
 2. NRC Range (ASTM C423 and E795): 0.20 to 0.05.
 3. Internal Absorber: [Internal absorber (IA)] [Internal liner (IL)].
 4. Finish: [White gel coat] [Paintable gel coat] [Fabric].
 5. Mounting: [Mechanical clips and Velcro fasteners] [As indicated on drawings].
- H. ESSI Barrel Shaped Diffuser Panel (Radius on Long Dimension):
1. Model and Size: [D42, 47 x 23 x 7 inches (1193.8 x 584.2 x 117.8 mm)] [D43, 47 x 35 x 7 inches (1193.8 x 889 x 117.8 mm)] [D53, 59 x 35 x 7 inches (1498.6 x 889 x 117.8 mm)] [D62, 71 x 23 x 7 inches (1803.4 x 584.2 x 117.8 mm)] [D42, 47 x 23 x 7 inches (1193.8 x 584.2 x 117.8 mm)] [D63, 71 x 35 x 7 inches (1803.4 x 889 x 117.8 mm)] [D64, 71 x 47 x 7 inches (1803.4 x 1193.8 x 117.8 mm)] [D84, 95 x 47 x 7 inches (2413 x 1193.8 x 117.8 mm)].
 2. NRC Range (ASTM C423 and E795): 0.20 to 0.05.
 3. Internal Absorber: [Internal absorber (IA)] [Internal liner (IL)].
 4. Finish: [White gel coat] [Paintable gel coat] [Fabric].
 5. Mounting: [Mechanical clips and Velcro fasteners] [Lay-in ceiling grid for D22, D24, D42 and D44] [As indicated on drawings].
- I. ESSI Pyramidal Shaped Diffuser Panel:
1. Model and Size: [P22, 23.75 x 23.75 x 8 inches (603.25 x 603.25 x 203 mm)] [P24, 23.75 x 47.75 x 12.5 inches (603.25 x 1212.85 x 317.5 mm)] [P44, 47.75 x 47.75 x 12.5 inches (1212.85 x 1212.85 x 317.5 mm)].
 2. NRC (ASTM C423, Type E Mounting): 0.15, minimum.
 3. Internal Absorber: [Internal absorber (IA)] [Internal liner (IL)].
 4. Finish: [White gel coat] [Paintable gel coat] [Fabric].
 5. Mounting: [Color coordinated screws] [Lay-in ceiling grid] [As indicated on drawings].
- J. Materials:
1. Reflector Panels: E-glass lined with K-cell foam core stiffener
 2. Absorber Panels: Sound absorptive glass fiber.
 3. Diffuser Panels:
 - a. Pyramid-Shaped: Rigid e-glass lined with glass fiber batting.
 - b. Barrel-Shaped: Rigid fiberglass.
 4. Finishes:
 - a. White Gel Coat: Manufacturer's standard.
 - b. Paintable Gel Coat: Manufacturer's standard.
 - c. Fabric: [Guilford of Maine, Guilford FR 701 Style 2100 (Terrafex)] [Customer's own material] [_____].
 - 1) Color: [_____] [As indicated on the drawings] [As selected from manufacturer's range of standard colors].
 5. Mounting Hardware:
 - a. Mechanical Clips: Two-part metal panel Z-clips, one part for attachment to panel and one part for attachment to wall.
 - b. Impaling Plates: Metal impaling plates for mechanical attachment to wall.

- c. Velcro Fasteners: Two-part Velcro fasteners for adhesive attachment to back of panel and to wall.
- d. Magnetic Hangers: Two-part magnetic tape system with magnetic tape for adhesive attachment to back of panel and to wall.
- e. Adhesive: Contact adhesive as recommended by manufacturer.
- f. Suspended Attachment System: Manufacturer's custom system with manufacturer's standard color-coordinated screws.
- g. Lay-in Acoustical Ceiling Grid: Specified elsewhere.

2.02 SOURCE QUALITY CONTROL

Specifier Note: Describe each test to be conducted. Include test method, sampling requirements, observation by independent authorities (if any) and reporting requirements. Describe each inspection to be conducted, including method, personnel and reporting requirements.

A. Tests and Inspections:

Specifier Note: Describe specific requirements for coordinating special inspections, such as providing access to authorities having jurisdiction or other third parties.

- 1. Manufacturer Services.
- 2. [_____].

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Verify that conditions of substrates previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer=s instructions prior to acoustic panel installation.
 - 1. Inform [Owner] [Architect] [Consultant] of unacceptable conditions immediately upon discovery.
 - 2. Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval from [Owner] [Architect] [Consultant]].
 - 3. [_____].

Specifier Note: Specify actions required to prepare the surface, area or site for incorporation of the section's primary products. Describe requirements for exposure or removal of existing assemblies, components, products or materials.

3.02 PREPARATION

Specifier Note: Specify preparatory work required prior to installation/application/erection of primary products.

- A. Ensure structure or substrate is adequate to support acoustic panels.
- B. Surface Preparation: Prepare surface in accordance with manufacturer=s written recommendations and coordinate with Section [01 71 00 - Examination and Preparation].
 - 1. [_____].

Specifier Note: Specify preparatory work, such as selective removal of existing work, required prior to execution of new work. Specify requirements for exposure or removal of existing assemblies, components, products or materials.

- C. Demolition/Removal:
 - 1. [_____].

3.03 INSTALLATION

- A. Coordinate installation of components in accordance with [01 73 19 - Installation].
- B. Coordinate acoustic panel work with work of other trades for proper time and sequence to avoid construction delays.
- C. Install acoustic panels plumb and level, unless indicated otherwise.
- D. Accurately fit, align, securely fasten and install free from distortion or defects.

Specifier Note: Specify how existing work is to be repaired, restored and cleaned.

3.04 [REPAIR]/[RESTORATION]

- A. Coordinate [repair] [restoration] of [systems] [components] [products] in accordance with Section [01 73 13 - Application].
 - 1. [_____].

3.05 CLEANING

- A. Perform cleanup in accordance with Section [01 74 00 - Cleaning and Waste Management] and Section [01 74 13 - Progress Cleaning].
- B. Upon completion, remove surplus materials, rubbish, tools and equipment in accordance with Section [01 74 23 - Final Cleaning].

Specifier Note: Specify special measures needed to minimize waste, collect recyclable waste and dispose of or recycle field-generated construction waste created during demolition, construction or final cleaning.

- C. Waste Management:
 - 1. Coordinate recycling of waste materials with [01 74 19 - Construction Waste Management and Disposal].
 - 2. Collect recyclable waste and dispose of or recycle field generated construction waste created during demolition, construction or final cleaning.
 - 3. Remove recycling containers and bins from site.
 - 4. [_____].

Specifier Note: Specify protection methods completed after installation, but prior to acceptance by the owner. Protection of surrounding areas and surfaces during application or installation is included under PART 3, Preparation. Include only statements unique to this Section.

Specifier Note: Coordinate the following Article with Section 01 76 00 - Protecting Installed Construction.

3.06 PROTECTION

- A. Protect installed product from damage during construction in accordance with Section [01 76 00 - Protecting Installed Construction].
- B. Repair damage to adjacent materials caused by acoustic panel installation.
- C. [_____].

Specifier Note: Specify attachments such as schedules, tables, illustrations or forms in this location if they are not incorporated directly within the specification text.

3.07 ATTACHMENTS

Specifier Note: Schedules are sometimes placed in the specifications rather than on the drawings. Include schedules that indicate item/element/product/equipment, location and other coordinating data.

- A. Schedules:
 - 1. [_____].

END OF SECTION