SECTION 09770

PERFORATED ABSORPTION+DIFFUSION WOODEN CEILING PANELS

**PART 1 GENERAL**

* 1. SECTION INCLUDES
1. Wood veneer panels that are perforated following an optimal binary pattern through the entire thickness of the panel for wall or ceiling application.
2. Sound absorbing blanket.
3. Hardware or ceiling suspension system as required for attachment to substrate.
4. Coordination with all trades having elements that attach to, penetrate through or are concealed behind/above the wood panels of this section.
	1. PRODUCTS INSTALLED BUT NOT SUPPLIED UNDER THIS SECTION
5. Sound Absorbing Blanket – Black glass fiber (or mineral wool) blanket 50 kg/m3 (3 pcf) density.
6. Mounting hardware or ceiling suspension grid and accessories.
	1. RELATED SECTIONS
7. Section 06420 – Wood Panel
8. Section 09120 – Suspension Framing/Furring for Plaster/Gypsum Board Assemblies
9. Section 09250 – Gypsum Board
10. Section 09510 – Acoustical Ceilings
11. Division 15 Sections – Mechanical Work
12. Division 16 Sections – Electrical Work
13. Division 17 Sections – Audio, Data, Telecommunication Work
	1. ALTERNATES
14. No Substitutions
	1. REFERENCES
15. Local Building Code – Current Edition
16. International Organization for Standardization
	1. ISO 354 - Measurement of Sound Absorption in a Reverberation Room
	2. ISO 10534 - Determination of sound absorption coefficient and impedance in impedance tubes - Part 1: Method using standing wave ratio.
17. American Society for Testing & Materials (ASTM)
	1. ASTM E 1050-98 - Standard Test Method for Impedance and Absorption of Acoustical Materials Using a Tube, Two Microphones, and a Digital Frequency Analysis System
	2. ASTM C 423 - Sound Absorption & Sound Absorption Coefficients by the Reverberation Room Method
	3. ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials.

* 1. SYSTEM DESCRIPTION

Design Requirements: Ceiling Panels shall absorb sound via *MDF* porous core and 30mm Mineral Wool absorber. High frequency absorption shall be determined by the percent open area and mid frequency absorption shall be determined by the thickness of the diaphragmatic surface template. Panels shall be supplied complete with aluminum MT2x3 Aluminum T Section and Star Clip Fasteners for concealed fastening. Panels shall be precision machined to insure exact locating of Star Clip. Face Perforations shall run to the edges of the panels (no solid borders). Panels shall be faced with Real Wood Veneers LLC , *Baltic Birch FC, Tint # 22289.* Reveal between panels shall be *Baltic Birch FC, Tint # 22289 Flitch #FN 2808 By AAPG* 0.25 inch (6mm) wide horizontal and vertical.

 B. Performance Requirements

* 1. Tested by independent, accredited,facility according to ASTM C 423.

**Substrate 250 Hz 500 Hz 1000 Hz 2000 Hz 4000 Hz**

**Thickness**

 18mm**”** 0.61 0.96 0.95 0.72 0.47

3. Noise Reduction Coefficient (NRC): Tested by independent, accredited facility according to ASTM C 423.

Noise Reduction Coefficient = **0.80**

* 1. SUBMITTALS
1. Product Data: Submit manufacturers’ technical data including basic system description, options and component sizes. Identify all applicable features and options. .
2. Shop Drawings: The contractor shall produce and submit shop drawings of products and suspension or mounting systems of (interior elevations or reflected ceiling plans) supplied electronically by the architect. Show overall layout with dimensions and references to details as necessary for penetrations, joints, ends and intersections with other materials or building components. Submit schedule of all quantities, sizes, edge banding, borders, veneers and finishes. Field-verify site conditions with dimensions shown on shop drawings.
3. Samples: Minimum 5” x 7” sample of specified panel and finish with black, non-woven, fiber backing material; 8” length samples of any exposed wall molding to be provided by manufacturer.
4. Certifications: Manufacturers’ certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
	1. QUALITY ASSURANCE
5. Qualifications: Manufacturer and installation contractor shall have a minimum of three years experience with similar systems.
6. Single Source: All products under this section shall be supplied by a single manufacturer to ensure consistency in product size and finish.
7. Woodworking Standards: Manufacturer to comply with specified provisions of Architectural Woodworking Institute quality standards.
8. Flame Spread / Smoke Developed Characteristics: Tested by independent, accredited facility.
	* 1. Class A Core: B2 MDF

 Tests: ASTM E 84

 Veneer: Class A

 Flame Spread Rating: 25 (maximum)

 Smoke Developed: 450 (maximum)

1. Pre-Installation Meeting: Installing contractor shall organize and conduct pre-installation meetings with all other trades to coordinate substrate conditions, conditioning of the space (temperature & humidity), and elements attaching to, penetrating through or concealed above/behind work in this section and matching of wood veneer finishes on doors and panels.
	1. DELIVERY STORAGE AND HANDLING
2. Shipping, Handling and Unloading: Deliver wood panels to the project site in the manufacturer’s original, unopened packaging. Do not unpack or handle finished products until the project environmental requirements have been met and the products are ready to be installed.
3. Storage and Protection: Store all wood panels and associated wood trim pieces in a clean, dry, fully-enclosed storage facility. Protect products from damage that may be caused by exposure to water, chemicals, direct sunlight or infestation.
4. Acceptance at Site: Ensure that all project environmental requirements have been met prior to unpacking or installing wood panels and all associated wood trim products. Full or partial installation constitutes complete product acceptance.
5. Waste Management and Disposal: Dispose of all packaging materials and debris in a safe and environmentally responsible manner according to the instructions set forth by the General Contractor, local ordinances or codes and the Environmental Protection Agency.
	1. PROJECT CONDITIONS
6. Project Environmental Requirements: Prior to unpacking or installing wood products, ensure that the installation area is fully enclosed and protected from moisture and direct sunlight. Ensure that the building’s mechanical systems are fully operational and will not be turned off again even for testing and balancing of the mechanical systems. Coordinate with other trades to ensure that all work above or behind wood surfaces is complete and that all wet and dusty trades have completed work.
7. Product Acclamation: For a minimum period of seventy-two (72) hours and prior to unpacking or installing any wood products, allow both the installation area and the wood products to stabilize in temperature and humidity levels that are representative of the final temperature and humidity levels expected after building completion and occupation. Do not install products if the humidity exceeds 60%.
8. Product Handling: Handle wood panels carefully so as to avoid chipping, scratching, scuffing or denting the wood finish or edges.
	1. WARRANTY
9. Submit to Owner or Owner’s Representative a written and dated warranty issued by the wood ceiling/wall manufacturer warranting the wood panels and associated trim pieces against defects in materials or manufacturing for a period of one (1) year from the date of delivery.
10. Components used in the system but not provided by the manufacturer are excluded from the manufacturer’s warranty. Damage caused by exposure to moisture or rapid or extreme changes to temperature or humidity are excluded from the manufacturer’s warranty. Damage caused by improper storage, handling, acclimatization, or installation is excluded from the warranty. Appearances and colorings of wood products, stains and finishes can vary over time and as site conditions change and are therefore excluded from the warranty.
	1. OWNER’S INSTRUCTIONS

A. Installing contractor shall provide to the building owner or to the owner’s representative a copy of the manufacturer’s maintenance manual supplied with the panels.

* 1. MAINTENANCE
1. Extra Materials: If provided per the project requirements, extra materials shall remain in the manufacturer’s original, unopened packaging and shall be given to the building owner or owner’s representative upon substantial completion of work.

**PART 2 PRODUCTS**

* 1. MANUFACTURER
	2. American Architectural Products Group, 2825 Commerce Parkway, North Port, FL34289.
	3. Distributed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	4. PRODUCTS

Wood Structural Acoustical Panels by Koroseal | AAPG

No Substitutions.

1. Core (standard): *B2 MDF*, 18 mm (0.75”) thick.
2. Veneer:, *Baltic Birch FC, Tint # 22289* Class A Fire Rated Veneer with foil substrate: Custom flitch (*FN 2808*) book matched and sequenced as selected by architect.
3. Backing Fabric: Non-woven, black, glass fiber matt, 60 g/m2 (0.012 psf) surface weight.
4. Acoustic Insulation: Non-woven, black, glass fiber batt (or mineral wool), 30 mm thick, 50 kg/m3 (3 pcf) minimum density.
	1. MANUFACTURED UNITS
	2. Panels (consult manufacturer for available combinations)
		1. Width: up to 3’ (915 mm)
		2. Length (Standards/Maximum): 96” (2440mm), 120” (3050mm)
		3. Thickness: ¾” (18 mm)
		4. Perforation: Spread and Size: 1.5mm, 0.5mm, 0.5mm
		5. Edge conditions
	3. Sides
		1. Visible: Straight cut, veneer and finish.
	4. Ends
		1. Standard (concealed): Straight cut, unfinished, partial perforations visible.
		2. Visible: Straight cut, veneer, finish, perforations set back from end so not visible.
	5. Edge molding: edge molding or custom trim per design requirements.
	6. ACCESSORIES
5. Custom Trim (optional): Custom wood trim pieces per drawings finished to match finish on panels.
6. Ceiling Grid Systems: T-Bar or other grid (by others) depending on panel size and accessibility requirements.
	1. FABRICATION
7. Fabrication Tolerances – 0.10 mm (perforations); 0.50 mm (lengths & widths)
	1. FINISHES
8. Shop Finishing: Panels shall be shop-finished with Dura finish 30% sheen.
	1. SOURCE QUALITY CONTROL
9. Manufacturing facility for panels should have a minimum of 10 years experience in custom acoustical wood panel manufacturing, fabrication and assembly.

**PART 3 EXECUTION**

* 1. INSTALLERS

A. Installing contractor shall have a minimum of five (5) years successful experience installing wood ceiling and wall systems in similar applications using similar mounting techniques or suspension systems.

* 1. EXAMINATION
1. Site Verification of Conditions: Examine installation area for compliance with all manufacturers’ project environmental requirements and ensure uninstalled products have been stored, handled and acclimatized properly prior to commencing installation. Inspect all substrates for completion and quality of work to ensure that surfaces are level, plumb, clean, dry and completely cured from water or solvent evaporation. Do not commence installation if the structural capacity of the substrate is questionable or inadequate.
2. Coordination with Other Trades: Coordinate with all other trades to ensure that wet work including concrete, terrazzo, plastering, painting, etc. in the installation area is complete, cured and dry prior to installation. Coordinate with all other trades to verify that components associated with mechanical, electrical, lighting, data, telecommunication, audio, video, fire suppression and other building systems are installed behind or above designated installation areas prior to commencing installation. Coordinate the exact size, location and sequencing of building system components that penetrate the wood ceiling/wall panels.
3. Insure that the Arbor Series wood finishes on the walls are sequenced and that the veneer sheets for adjacent doors are provided to the door manufacturer with sequence instructions so as to insure grain and color consistency across the the wall panels and doors.
	1. PREPARATION
4. Protection: Protect all floor, wall and ceiling finishes against possible damage prior to commencing installation and during installation.
5. Surface Preparation: When necessary, field measure substrates to acquire accurate dimensions of wood panels and submit final dimensions to manufacturer.
	1. INSTALLATION
6. Install wood panels as shown and detailed in the architectural drawings and according to manufacturer’s guidelines and industry standards as prescribed by the AWI.
7. Install wood panels with expansion/contraction gaps equal to 1 mm (1/32”) for every 1 meter (3.28’) of length/width (3 mm minimum between panels).
	1. CONSTRUCTION
8. Interface with Other Work: Support all light fixtures, HVAC air inlet/outlet devices, speakers, signage, sprinkler heads/piping, etc. independently from wood panels. Contractor shall not use wood panels to support the weight of any other building element or component.
	1. ADJUSTING
9. Following initial installation, adjust mounting hardware or suspension system so that removable panels can be removed easily, yet stay safely secured upon replacement. Adjust panels so that surfaces are aligned, flush and level or plumb and gaps in between units are of a consistent width and straight.
10. Check that manufacturer’s expansion/contraction requirements were maintained during installation. As required, adjust the mounting hardware or suspension system to allow for the appropriate amount of product expansion/contraction.
11. Remove and replace at no extra charge any damaged panels that cannot be repaired to the Owner’s and Architect’s satisfaction.
	1. CLEANING
12. Remove dust from surfaces and penetrations by vacuuming using only a soft brush. Do not scratch wood surfaces with sharp metal or plastic vacuum cleaner extensions. Remove pencil marks with soft erasure. Remove general surface dirt with a clean, soft cloth dampened with a diluted, mild, cleaning agent and warm water. Wipe again with clean, soft cloth dampened only with warm water. Finally, dry surface completely with clean, dry cloth. Do not use abrasive cleaners with grit or cloths that could scratch the wood finish.
13. Remove and replace at no additional charge any materials that cannot be cleaned to the Owner’s satisfaction.
	1. DEMONSTRATION
14. Demonstrate to the building owner or to the owner’s representative the safe and proper method for removing and replacing all types of accessible panels.
15. Supply the building owner or the owner’s representative with any special tools provided by the manufacturer required to unlatch safety hardware on accessible panels.
	1. PROTECTION

A. Upon completion of work, protect installed wood surfaces from damage or soiling until project substantial completion and owner occupancy.

END OF SECTION