Project Name:

Project Ref. #:

Architect:

**SECTION 09 84 00**

**Two-Dimensional Quadratic Residue Diffuser (REALDIFF HDS)**

**PART 1 – GENERAL**

* 1. RELATED DOCUMENTS
1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section 06420 – Wood Paneling
2. Section 09120 – Suspension Framing/Furring for Plaster/Gypsum Board Assemblies
3. Section 091000 – Gypsum Board
4. Division 15 Sections – Mechanical Work
5. Division 16 Sections – Electrical Work
6. Division 17 Sections – Audio, Data, Telecommunication Work
	1. SUMMARY
7. Section Includes: [description]
	1. REFERENCES
8. American Society for Testing & Materials (ASTM) International:
9. ASTM C423 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
10. ISO 17497-1 and ISO 17497-2 Standard Test Methods for diffusion and scattering of acoustic materials and proposed ASTM Standard Test Method for Testing the Reflectivity of Surfaces
11. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Material
	1. SYSTEM DESCRIPTION
12. Two-Dimensional Quadratic Residue Diffusers are standalone units that may be used singly or in multiples featuring prime numbers of not less than 13 and with full sequences (0-0) that do not require special coupling or custom units for centers and ends.
13. Performance Requirements:
14. Surface Burning Characteristics (ASTM E84):
15. Flamespread: 25 maximum
16. Smoke Developed: 1000 maximum
17. Fire ratings for all wood products shall meet or exceed ASTM E84 Class “A” standards.
	1. SUBMITTALS
18. General: Submit listed submittals in accordance with the following:
19. Division 00: Procurement and Contracting Requirements
20. Division 01 General Requirements
21. Product Data: Submit product data sheet, for specified products
22. Shop Drawings: Submit shop drawings showing layout, edge profiles and panel components, including mounting, hardware and finishes and/or other materials
23. Samples: Submit selection and verification samples of finishes, colors and textures. Samples shall be a minimum of 10”x10”
24. Test Reports: Certified test reports showings compliance with specified performance requirements. All acoustic absorption tests shall be verified utilizing either ASTM C423 or ISO 354 absorption standards. All diffusion and/or scattering test data shall be, at minimum, ISO 17497-1 and/or ISO 17947-2 (AES 4-id) or ASTM Proposed Test Method for Testing the Reflectivity of Surfaces. ASTM E84 standard test method for flame and smoke spread (fire test). All test data must be modeled and performed on full-size products to ensure the accuracy of results.
	1. QUALITY ASSURANCE

Specifier Note: Manufacturers and installers shall have a minimum 5 years of experience in the manufacturing and/or installation of the materials specified in this document. All wood products shall be manufactured utilizing AWI standards and practices.

* 1. DELIVERY, STORAGE, & HANDLING
1. General: Comply with Division 01 Product Requirements Section
2. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact
3. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions as listed in section 1.8.
	1. PROJECT CONDITIONS
4. Environmental Requirements: Do not install panels until wet work, such as concrete and plastering, is complete; the building is enclosed; and the temperature, as well as the relative humidity, are stabilized at 55 – 75 degrees F (16 – 27 degrees C) and 35% MINIUMUM RH and 55% MAXIMUM RH, respectively. All products constructed with wood, MDF, or other wood fiber content must be stored for at least 72 hours in the controlled environment specified herein prior to installation to allow the materials to stabilize. Environmental Standards shall meet or exceed the requirements as issued by the Architectural Woodwork Institute.
	1. MOCKUP
5. Panel mockup may be provided at the request of the general contractor or architect
	1. WARRANTY
6. Refer to manufacturer for details on warranty

**PART 2 – PRODUCTS**

2.1 PRODUCT: RealDiff HDS Two-Dimensional Quadratic Residue Diffuser

1. Manufacturer: RealAcoustix LLC. (Basis of Design)
2. Contact: 2361 B Avenue, Ogden, UT 84401; Phone: (801) 782-1010; Email:Info@RealAcoustix.com; Site: <http://www.realacoustix.com/>
3. Substitutions: No substitutions permitted

2.2 MATERIALS

1. Core (Standard): MDF with finished veneers.
2. Veneers: Natural wood veneer, species and cut (Maple/Plain-sliced) Plastic Laminate (Manufacturer)

2.3 MANUFACTURED UNITS

1. PRODUCT NAME: RealDiff HDS
2. Thickness: 3”
3. Size: Standard: 23 5/8” x 23 5/8”. See drawings
4. Core: MDF
5. Edge Detail: Squared
6. Face: Multi-cell surface with finished cells of different depths based on the Schroeder quadratic residue equation.
7. Test Data: See below.
8. Mounting Hardware: [Z-Clip & Z-Bar] [Other: Specify]

2.4 TEST DATA

See Following Page:

 2.4 TEST DATA



2.5 FABRICATION

1. RealDiff 2D Quadratic Residue Diffusers are CNC cut with a minimum of .01 tolerance standard for all parts. All assembly is done by qualified factory staff. All units are mounted standard by Z-clip/Z-bar per instructions

2.6 FINISHES

1. Shop Finishing: Panels shall be shop-finished with clear pre-catalyzed lacquer finish system or water-based lacquer depending on the wood species and specifications unless plastic laminates or fabrics are utilized.

**PART 3 – EXECUTION**

3.1 MANUFACTURER’S INSTRUCTIONS

1. Compliance: Comply with manufacturer’s product data, including product technical bulletins, product catalog installation, instructions and product carton instructions for installation

3.2 EXAMINATION

1. Site Verification and Conditions: Please refer to section 1.8
2. Site Verification of Condition: Examine installation area for compliance with all manufacturer’s 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.
3. 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
4. installation. Coordinate the exact size, location and sequencing of building system components that penetrate the wood ceiling/wall panels.

3.3 PREPARATION

1. Protection: Protect all floor, wall and ceiling finishes against possible damage prior to commencing installation and during installation
2. Surface Preparation: When necessary, field measure substrates to acquire accurate dimensions of acoustical panels and submit final dimensions to manufacturer

3.4 INSTALLATION

1. Install acoustical panels as shown and detailed in the architectural drawings, shop drawings (manufacturer provided) and according to manufacturer’s guidelines and industry standards
2. Install acoustical panels with expansion/contraction gaps appropriate for the project and as identified in the submittal documentation

3.5 CONSTRUCTION

1. Interface with Other Work: Support all light fixtures, HVAC air inlet/outlet devices, speakers, signage, sprinkler heads/piping, etc. independently from acoustical panels. Contractor shall not use acoustical panels to support the weight of any other building element or component.

3.6 ADJUSTING

1. 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.
2. 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.
3. Remove and replace any damaged panels that cannot be repaired to the Owner’s and Architect’s satisfaction.

3.7 CLEANING

1. Follow manufacturer’s instructions for cleaning panels soiled during installation. Replace panels that cannot be cleaned to as new condition.
2. Keep site free from accumulation of waste and debris

3.8 DEMONSTRATION

1. 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
2. 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

3.9 PROTECTION

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

**END OF SECTION**