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## SECTION 09 54 28 – OPEN CELL WOOD CEILINGS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes: Suspended open cell wood ceiling panels.
- B. Related Requirements:
  - 1. Section 09 2 226 - Suspension Systems
  - 2. Section 09 51 13 - Acoustical Panel Ceilings; suspension system.
  - 3. Section 09 54 24 - Linear Wood Ceilings.
  - 4. Section 09 54 27 - Suspended Wood Grille Ceilings
  - 5. Section 09 54 33 - Wood Coffered Ceilings.
  - 6. Section 09 54 63 - Suspended Curved Wood Canopies

#### 1.2 REFERENCES

- A. ASTM International (ASTM):
  - 1. A641/A641M: Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
  - 2. C635/C635M: Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
  - 3. C636/C636M: Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
  - 4. E84: Surface Burning Characteristics of Building Materials.
- B. Ceilings and Interior Systems Construction Association (CISCA): Ceiling Systems Handbook.
- C. **[FSC® CoC: Forest Stewardship Council® Chain of Custody Certification]**

### 1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
  - 1. Coordinate suspension hanger locations with sizes and locations of wood panels.
  - 2. To extent practical, schedule installation of wood panels after work above ceiling is complete.
- B. Pre-Installation Meeting: Schedule a pre-installation at the site to coordinate work of suspension system and hanging of panels.
  - 1. Meeting shall be attended by Contractor, Architect, and installer of system components.
  - 2. Comply with requirements in [Section 01 31 00 “Project Management and Coordination”].<Insert Section number and title.>

### 1.4 ACTION SUBMITTALS

- A. Shop Drawings: Show panel layout and spacing, typical panel dimensions, and **[ceiling suspension]**.
  - 1. **[Include details of suspension system, and include the following.]**
    - a. **Layout of suspension system and location of hangers, seismic braces, and trapezes.**
    - b. **Inserts and hanger spacing and fastening details.**
    - c. **Trapeze details.]**
  - 2. **[Include dimensions of custom-sized panels.]**
- B. Product Data: Manufacturer’s descriptive information for the wood panels, wood species, solid or wood veneer, **[and suspension system]**. **[Include panel flammability characteristics.]**
- C. Samples:
  - 1. Sample shall be fabricated using selected solid or wood veneer with manufacturer’s proposed finish coating.
  - 2. Size: Full panel.
- A. **[Delegated Design: Seismic and structural design engineering calculations for suspension system prepared by the engineer in responsible charge retained by the Contractor shall be submitted to demonstrate compliance with governing code and adequacy of suspension system to withstand specified seismic and structural loading. Engineer shall be a civil or structural engineer licensed in the State of [\_\_\_\_\_].]**
- D. **[Sustainable Design (LEED):]**
  - 1. **General:**
    - a. **Submit information necessary to establish and document compliance with the LEED Certification goals for this Project.**
    - b. **LEED design submittals are in addition to other submittals.**
    - c. **If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with specified LEED requirements.**
    - d. **Refer to Section 01 81 13 “Sustainable Design Requirements” for additional information and documentation requirements.**
  - 2. **The following information shall be provided:**
    - a. \_\_\_\_\_]

## 1.5 INFORMATIONAL SUBMITTALS

- A. Statement of installer qualifications.
- B. **[Certification that wood items meet specified fire-resistance characteristics if not included with product data.]**
- C. **[Engineering calculations for seismic bracing.]**

## 1.6 CLOSEOUT SUBMITTALS

- A. Maintenance data.

## 1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: FSC Chain of Custody Certification.
- B. Mockups: First installed panels shall serve as mockup for review and approval by Architect of workmanship, visual effect, acoustical deflection, and interface with adjoining construction.
  - 1. Mockup shall include a minimum of 4 [ ] adjacent panels in approved layout.
  - 2. Make modifications to mockup if requested by Architect including adjustments to installation angle or angles of panels.
  - 3. Accepted mockup may remain as part of the work.
  - 4. **[Comply with additional requirements of Section 01 4339, "Mockups."]**

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver wood panels until specified ambient conditions are met.
- B. Store wood panels in conditioned space and keep dry.
- C. Conditioning: Move wood panels into pre-conditioned spaces where they will be installed to allow the moisture content of wood to achieve equilibrium with its environment.
  - 1. Remove panels from sealed packages to facilitate acclimation.
  - 2. Contractor shall allow not less than 72 hours to allow wood panels to acclimate at site.

## 1.9 FIELD CONDITIONS

- A. Ambient Conditions: Do not proceed with installation until dust-generating activities have been terminated and building temperature and humidity conditions approximate conditions that will exist when the Building is occupied. All wet work, including painting, shall be completed and dry before installation.
- B. Do not install wood panels until work above or behind them is completed, including testing and approval of mechanical work.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURER

- A. Acceptable Manufacturer: Madrid Inc.
1. Address: 7800 Industry Ave., Pico Riviera, CA 90660
  2. Phone: 562-942-0707
  3. Email [sales@madridinc.com](mailto:sales@madridinc.com)
  4. Web: [madridinc.com](http://madridinc.com)
- B. Substitutions: **[Not permitted.] [Substitutions will be considered according to requirements specified in Section 01 25 00 “Substitution Procedures.”]**

## 2.2 DESIGN AND PERFORMANCE CRITERIA

- A. Seismic Requirements: Provide compression struts, bracing, and other suspension system components to meet requirements of the governing Code.
- B. Ceiling suspension system shall not be visible from eye level of a person standing on the floor. Orient suspension and bracing away from visible edges.
- C. **[Sustainable Design:**
1. **Refer to Section 01 81 13 “Sustainable Design Requirements” for additional information.]**

## 2.3 OPEN CELL WOOD PANELS

- A. Configuration:
1. Panel Dimensions: **[2 foot x 2 foot, nominal] [Custom, as shown]**.
  2. Grid Module: **[5 inches] [8 inches] [Custom as shown]**.
  3. Cell Depth: **[3-1/4 inch] [2-1/4 inch] [Custom, as shown]**.
  4. Wood Veneer, or Solid Wood: As specified.
- B. Wood Veneer:
1. Core:
    - a. Recycled Fiber: ANSI A208.1 Grade M-2, complying with Composite Panel Association’s Environmentally Preferable Product Downstream Program 2-06; Madrid “Bio-Blend.”
      - 1) Indoor Air Quality: No VOC. No added urea formaldehyde.
    - b. Medium Density Fiberboard (MDF): ANSI A208.2, Grade 130, fire-treated.
    - c. Face Veneer Species and Cut: [\_\_\_\_\_].
    - d. [Wood veneer shall be FSC<sup>®</sup> Certified.]
- C. Solid Wood:
1. Species and Cut:
    - a. **[Plain][Rift]** sliced Oak.
    - b. **[Plain][Quarter]** sliced Cherry.
    - c. **[Plain][Quarter]** sliced Maple.
    - d. **[Plain][Quarter]** sliced Mahogany.

- D. Perimeter Rails: To match **[solid wood] [veneered]** open cell panels.
  - 1. Thickness: 7/8 inch by height as standard with manufacturer.
- E. Adhesives: EPA **[and California Air Resources Board]** VOC compliant.
- F. Mounting Clips: As standard with manufacturer, factory-installed at opposing ends of panel grid.

## 2.4 SUSPENSION SYSTEM

- A. Suspension Grid and Hanger System: As specified in Section [\_\_\_\_\_].
- B. Suspension Grid: Direct-hung, exposed tee grid, 15/16-inch face; "Prelude XL" by Armstrong or equal.
  - 1. Comply with ASTM C635.
  - 2. Structural Classification: Heavy-duty.
- B. Suspension Wire and Rods:
  - 1. Hanger Wire: 0.106 inch nominal diameter (12 gage), ASTM A641, Class 1 zinc coating, soft temper.
  - 2. Bracing Wire: 0.120-inch nominal diameter (10 gage), ASTM A641, Class 1 zinc coating, soft temper.
  - 3. Suspension Rods: Low-strength steel "all-thread," diameter as required, Class 1 zinc coating.
- C. Compression Struts: As shown on the Drawings, or manufactured struts; Donn "Seismic Compression Post," or accepted equal.
- D. Attachment Devices: Size for five times design load required by ASTM C635, Table 1, Direct Hung, unless otherwise indicated.
- C. Finish:
  - 1. Steel components shall be Bonderized and given a coat of rust-inhibitive paint.
  - 2. Exposed surfaces of components shall have a factory-applied flat black finish paint.

## 2.5 ADDITIONAL MATERIALS

- A. Acoustical Backing: Black faced board as specified in Section [\_\_\_\_\_].
- B. Acoustical Backing: Glass fiber board with black, non-woven mat facing fully bonded to core, conforming to ASTM C612, Class 1A, "CertaPro AcoustaBoard Black" by CertainTeed, or equal.
  - 1. Thickness: **[1 inch] [1-1/2] [2] [\_\_\_]** inch.
  - 2. Density: 3.0 [\_\_\_] pounds per cubic foot.
  - 3. Surface Burning Characteristics: UL723.
    - a. Smoke Developed: 50 or less.
    - b. Flame Spread: 25 or less.

## 2.6 FABRICATION

- A. Fabricate in accordance with reviewed shop drawings.
- B. Fabrication Tolerances: Complying with CISCA Wood Ceilings Technical Guidelines.

## 2.7 FINISHES

- A. Shop Finishing: **[Transparent, water-based UV-cured matte finish as standard with manufacturer.][Insert custom requirements.]**

## PART 3 - EXECUTION

### 3.1 INSTALLATION OF SUSPENSION SYSTEM

- A. General: Install suspension system, including necessary hangers, grillage, and other supporting hardware in accordance with the **[IBC] [\_\_\_\_\_]**, ASTM C636, and procedures in CISCA publication "Acoustical Ceiling Use and Practice." Comply with the most stringent requirements.
- B. Hangers:
  - 1. Coordinate hanger location with other work. Hanger wire attachment devices shall be capable of supporting 100 pounds.
  - 2. Ensure that hangers and carrying channels are located to accommodate fittings and equipment that are to be placed after installation of ceiling grid system.
  - 3. Space hanger wire **[4 feet on center, each direction with maximum supported tributary area of 16 square feet] [as required by code for specified wire gage]**.
  - 4. Install additional hangers at ends of each suspension member and 6 inches from vertical surfaces.
  - 5. Do not splay wires more than 5 inches in a 4 foot vertical drop.
  - 6. Wrap wire at least three times horizontally, turning ends upward in the first 3 inches.
  - 7. Provide trapeze suspension or other appropriate system for suspension of ceiling system at large ductwork and other similar obstructions.
  - 8. Kinks and bends are not permitted in hanger wires to level carrying channels.
- C. Main Runners:
  - 1. Space main runners at 4 feet on center.
  - 2. Level and square to adjacent walls.
  - 3. Secure to structure above with four-way, bracing wire splays as specified and to meet applicable building code requirements for lateral design.
- D. Space cross runners at 2 feet on center.
- E. Seismic Bracing Assembly: Compression struts and splayed wires.
  - 1. Horizontal Restraints: 4 splayed wires oriented 90 degrees from each other.
    - a. Seismic bracing wires may be 12 gage if permitted by code.
    - b. Provide at no more than 12 feet on center in each direction **[and as noted on the Drawings]**:
    - c. Splices in bracing wires are not permitted.

- d. Angle of wires shall not exceed 45 degrees from the plane of the ceiling.
2. Vertical Compression Struts: A strut to resist vertical displacement at each seismic splay.
  - a. Struts shall extend from the grid to structure above and shall be fastened at both ends.
  - b. Compression struts shall not replace hanger wires.
  - c. If other than a manufactured proprietary strut is used, it shall be approved by the [\_\_\_\_\_].
  - d. Ceiling areas exceeding 2,500 square feet shall have a seismic separation joint with each area provided with closure angles.
  - e. Seismic perimeter clips shall have current and approved ICC-ES Report and shall be installed in accordance with the details and recommendations of the Report.
3. Provide spreader bars at all main and perimeter runners.

### 3.2 INSTALLATION OF CEILING PANELS

- A. Install panels by laying into in grid system in accordance with manufacturer's recommendations and procedures in CISCA publication "Acoustical Ceiling Use and Practice."
- B. Secure perimeter rails with screws to bottom flange of suspension grid.
- C. Install hold-down clips to prevent movement or displacement of panels.
- D. Coordinate lay-in system with electrical fixtures and mechanical work that interfaces with ceiling.

### 3.3 CLEANING AND PROTECTION

- A. Clean panels as recommended by manufacturer.
- B. Prevent damage to panels during remainder of construction.

END OF SECTION 09 54 28