

## **SECTION 09 50 00**

### **Acoustical Ceilings**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

##### **1.2 SUMMARY**

###### A. Section Includes

1. Acoustical ceiling panels
2. Exposed grid suspension system
3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings
4. Perimeter Trim

###### B. Related Sections

1. Section 09 51 00 - Acoustical Ceilings
2. Section 09 51 13 - Acoustical Fabric-Faced Panel Ceilings
3. Section 09 53 00 - Acoustical Ceiling Suspension Assemblies
4. Section 09 20 00 - Plaster and Gypsum Board
5. Section 01 81 13 - Sustainable Design Requirements
6. Section 01 81 19 - Indoor Air Quality Requirements
7. Section 02 42 00 - Removal and Salvage of Construction Materials
8. Divisions 23 - HVAC Air Distribution
9. Division 26 - Electrical

###### C. Alternates

1. Prior Approval: Unless otherwise provided for in the Contract documents, proposed product substitutions may be submitted no later than TEN (10) working days prior to the date established for receipt of bids. Acceptability of a proposed substitution is contingent upon the Architect's review of the proposal for acceptability and approved products will be set forth by the Addenda. If included in a Bid are substitute products that have not been approved by Addenda, the specified products shall be provided without additional compensation.

2. Submittals that do not provide adequate data for the product evaluation will not be considered. The proposed substitution must meet all requirements of this section, including but not

necessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); Underwriters' Laboratories Classified Acoustical performance; Panel design, size, composition, color, and finish; Suspension system component profiles and sizes; Compliance with the referenced standards.

### 1.3 REFERENCES

#### A. American Society for Testing and Materials (ASTM):

1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
4. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
5. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
6. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
7. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
8. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
9. ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Material
  - A. Armstrong Fire Guard Products
10. ASTM E 580 Installation of Metal Suspension Systems in Areas Requiring Moderate Seismic Restraint
11. ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems
12. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
13. ASTM E 1264 Classification for Acoustical Ceiling Products

#### B. International Building Code

#### C. ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality

#### D. NFPA 70 National Electrical Code

#### E. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures

#### F. International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components

G. International Code Council-Evaluation Services Report - Seismic Engineer Report

1. ESR 1308 - Armstrong Suspension Systems

H. International Association of Plumbing and Mechanical Officials - Seismic Engineer Report

1. 0244 - Armstrong Single Span Suspension System

I. California Department of Public Health CDPH/EHLB Emission Standard Method Version 1.2 2017

J. LEED - Leadership in Energy and Environmental Design is a set of rating systems for the design, construction, operation, and maintenance of green buildings

K. International Well Building Standard

L. Mindful Materials

M. Living Building Challenge

N. U.S. Department of Agriculture BioPreferred program (USDA BioPreferred).

#### **1.4 SYSTEM DESCRIPTION**

Continuous/Wall-to-Wall

#### **1.5 SUBMITTALS**

A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.

B. Samples: Minimum 6 inch x 6 inch samples of specified acoustical panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.

C. Shop Drawings: Layout and details of acoustical ceilings show locations of items that are to be coordinated with or supported by the ceilings.

D. Acoustical Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.

a. If the material supplied by the acoustical subcontractor does not have an Underwriter's Laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the architect's or owner's discretion. All products not

conforming to manufacturer's current published values must be removed, disposed of, and replaced with complying product at the expense of the Contractor performing the work.

## 1.6 SUSTAINABLE MATERIALS

Transparency: Manufacturers will be given preference when they provide documentation to support sustainable requirements for the following: Material ingredient transparency, Removal of Red List Ingredients per LBCV3, Life Cycle impact information, Low-Emitting Materials, and Clean Air performance.

1. Health Product Declaration. The end use product has a published, complete Health Product Declaration with disclosure at a minimum of 1000ppm of known hazards in compliance with the Health Product Declaration Open Standard.

2. Declare Label. The end use product has a published Declare label by the International Living Future Institute with disclosure of 100 ppm with a designation of Red List Free or Compliant (less than 1% proprietary ingredients).

3. Low Emitting products with VOC emissions data. Preference will also be given to manufacturers that can provide emissions data showing their products meet CDHP Standard Method v1.1 (Section 01350).

4. Life cycle analysis. Products that have communicated lifecycle data through Environmental Product Declarations (EPDs) will be preferred.

5. End of Life Programs/Recycling: Where applicable, manufacturers that provide the option for recycling of their products into new products at end-of-life through take-back programs will be preferred.

6. Products meeting LEED V4 requirements including:

Storage & Collection of Recyclables

Construction and Demolition Waste Management Planning

Building Life-Cycle Impact Reduction

Building Product Disclosure and Optimization Environmental Product Declarations

Building Product Disclosure and Optimization Sourcing of Raw Materials

Building Product Disclosure and Optimization Material Ingredients

Construction and Demolition Waste Management

## **1.7 QUALITY ASSURANCE**

A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.

1. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.

2. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 Classification.

3. Fire Resistance: As follows tested per ASTM E119 and listed in the appropriate floor or roof design in the Underwriters Laboratories Fire Resistance Directory

B. Acoustical Panels: As with other architectural features located at the ceiling, may obstruct or skew the planned fire sprinkler water distribution pattern through possibly delay or accelerate the activation of the sprinkler or fire detection systems by channeling heat from a fire either toward or away from the device. Designers and installers are advised to consult a fire protection engineer, NFPA 13, or their local codes for guidance where automatic fire detection and suppression systems are present.

C. Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

## **1.8 DELIVERY, STORAGE AND HANDLING**

A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

## **1.9 PROJECT CONDITIONS**

A. Space Enclosure:

HumiGuard Plus Ceilings: Building areas to receive ceilings shall be free of construction dust and debris. Products with HumiGuard Plus performance and hot dipped galvanized steel, aluminum or stainless steel suspension systems can be installed up to 120°F (49°C) and in spaces before the building is enclosed, where HVAC systems are cycled or not operating. Cannot be used in exterior applications where standing water is present or where moisture will come in direct contact with the ceiling.

## **1.10 ALTERNATE CONSTRUCTION WASTE DISPOSAL**

- A. Ceiling material being reclaimed must be kept dry and free from debris.
- B. Contact the Armstrong Recycle Center a consultant will verify the condition of the material and that it meets the Armstrong requirements for recycling. The Armstrong consultant will provide assistance to facilitate the recycling of the ceiling.
- C. Recycling may qualify for LEED Credits:
  - a. LEED 2009 - Category 4: Material and Resources (MR)
    - i. Credit MRc2: Construction Waste Management
    - b. LEEDv4 - MRp2 - Construction Waste Management Planning Qualifies as a material stream (non-structural) targeted for diversion. Ceilings will be source-separated and diverted through the Armstrong Ceiling Recycling Program.
  - c. LEEDv4-MRc5 -
    - i. Option 1: Divert ceilings to qualify for one of the 3 material streams (50%)
    - ii. Option 2: Divert ceilings to qualify for one of the 4 material streams (75%)

## **1.11 WARRANTY**

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to the following:
  - 1. Acoustical Panels: Sagging and warping
  - 2. Grid System: Rusting and manufacturer's defects
- B. Warranty Period:
  - 1. Acoustical panels: Ten (10) years from date of substantial completion
  - 2. Suspension: Ten (10) years from date of substantial completion
  - 3. Ceiling System: Thirty (30) years from date of substantial completion

C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

## **1.12 MAINTENANCE**

A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.

1. Acoustical Ceiling Units: Furnish quality of full-size units equal to 5.0 percent of amount installed.

2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

A. Ceiling Panels:

1. Armstrong World Industries, Inc.

B. Suspension Systems:

1. Armstrong World Industries, Inc.

#### **2.2.1 ACOUSTICAL CEILING UNITS**

A. Acoustical Panels Type AP

1. Surface Texture: Smooth

2. Composition: Mineral Fiber

3. Color: White

4. Size: (24" x 24") (24" x 48") (MTO sizes)

5. Edge Profile: (Square Lay-In 15/16") (Beveled Tegular for 15/16") (Beveled Tegular for 9/16") for interface with (PRELUDE XL 15/16" Exposed Tee) (Silhouette XL 9/16" ¼" Reveal) (Silhouette XL 9/16" 1/8" Reveal) (Suprafine XL 9/16" Exposed Tee) (Interlude XL HRC 9/16") as manufactured by Armstrong World Ind. Inc.

6. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton 0.65

7. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton 35

8. Sabin: N/A

9. Articulation Class (AC):
10. Flame Spread: ASTM E 1264; Class A (UL)
11. Light Reflectance (LR) White Panel: ASTM E 1477; 0.80
12. Dimensional Stability: HUMIGUARD Plus
13. Recycle Content: Post-Consumer - 1% Pre-Consumer - 43%
14. Material Ingredient Transparency: Health Product Declaration (HPD); Declare Label
15. Life Cycle Assessment: Third Party Certified Environment Product Declaration (EPD)
16. Acceptable Product: CANYON, (1490) (1491) (1492) (1493) (1494) (1495) No added formaldehyde as manufactured by Armstrong World Industries

### **2.3.1 METAL SUSPENSION SYSTEMS**

#### **A. Components:**

Main beams and cross tees, base metal, and end detail, fabricated from commercial quality hot dipped galvanized steel complying with ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.

- a. Structural Classification: ASTM C 635 Intermediate Duty
- b. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
- c. Sustainability: Environmental Product Declaration (EPD), Health Product Declaration (HPD)
- d. Acceptable Product: (PRELUDE XL 15/16" Exposed Tee) (Silhouette XL 9/16" ¼" Reveal) (Silhouette XL 9/16" 1/8" Reveal) (Suprafine XL 9/16" Exposed Tee) (Interlude XL HRC 9/16") as manufactured by Armstrong World Ind. Inc.

**B. Attachment Devices:** Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.

**C. Wire for Hangers and Ties:** ASTM A 641, Class 1 zinc coating, soft annealed, with a yield stress load of at least three times design load, but not less than 12 gauge.

#### **D. Edge Moldings and Trim:**

1. As noted per Architect.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations. (Exception: HumiGuard Max Ceilings)

### 3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

B. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.

1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

### 3.3 INSTALLATION

A. Follow manufacturer installation instructions.

B. Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.

C. Suspend main beam from overhead construction with hanger wires spaced 4'-0" on center along the length of the main runner. Install hanger wires plumb and straight.

D. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.

E. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.

F. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

### 3.4 ADJUSTING AND CLEANING

A. Replace damaged and broken panels.

B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish

damage. Remove any ceiling products that cannot be successfully cleaned and or repaired. Replace with attic stock or new product to eliminate evidence of damage.

C. Before disposing of ceilings, contact the Armstrong Recycling Center at 877-276-7876, select option #1 then #8 to review with a consultant the condition and location of building where the ceilings will be removed. The consultant will verify the condition of the material and that it meets the Armstrong requirements for recycling. The Armstrong consultant will provide assistance to facilitate the recycle of the ceiling.