Armstrong World Industries, Inc.

Ceiling & Suspension System Specification

Please understand that you are responsible for the accuracy of all project specifications, including any Armstrong guide specifications that you use.

ARMSTRONG SHALL NOT BE LIABLE FOR ANY DAMAGES ARISING OUT OF THE USE OF ANY OF ITS GUIDE SPECIFICATIONS.

SECTION 09 54 23 (09545)
LINEAR METAL CEILINGS - INTERIOR

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. Metal ceiling panels.
2. Suspension system.
3. Wire hangers, carrier channels, wall angle moldings and accessories.

B. Related Sections:
1. Section 09 51 00 (09510) – Acoustical Ceilings
2. Section 09 20 00 (09250) – Plaster and Gypsum Board
3. Division 23 (15) Heating, Ventilating, and Air Conditioning
5. Division 26 (16) Electrical Work

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 which have not been approved by Addenda, the specified products shall be provided without additional compensation.
2. Submittals which 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 neccessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); 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 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
2. ASTM B 209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
3. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
4. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.

B. International Code Council Evaluation Service
1. AC156 - Acceptance Criteria for Seismic Qualification Testing of Non-structural Components

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical data for each type of ceiling unit and suspension system required.
B. Installation Instructions: Submit manufacturer's installation instructions as referenced in Part 3, Installation.
C. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.

1.5 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide Connections metal ceiling and suspension components produced by a single manufacturer with resources adequate to deliver a product of consistent quality in terms of appearance and physical properties for all project scopes and scales without risk of delay or interruption.
B. Fire Performance Characteristics: Identify ceiling components with appropriate applicable, testing, including:
1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with Class A fire performance as follows:
    a. Flame Spread: 25 or less
    b. Smoke Developed: 50 or less

C. Seismic Performance: System seismic performance verified through full-scale testing in accordance with ICC-ES – AC-156 Acceptance Criterial for Seismic Qualification Testing of Non-Structural components.
D. Coordination of Work: Coordinate ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver system components in manufacturer's original, unopened packages clearly labeled with the following information: item number and quantity, manufacturer's name and address, client name and address and site address.
B. Store components in a fully enclosed dry space where they will be protected against damage from moisture, direct sunlight, surface contamination and other construction activities.
C. Exercise care in handling components to prevent damage to the surfaces and edges and prevent distortion or other physical damage.

1.7 PROJECT CONDITIONS

A. Space Enclosure:
Building areas to receive ceilings shall be free of construction dust and debris. Products may be installed where temperatures are between 32$_o$F (0°C) and 120°F (49°C) and in spaces before the building is enclosed, where HVAC systems are cycled or not operating. Such installations shall not be exposed to abnormal conditions, namely: chemical fumes, presence of standing water, or contact with moisture, as could result from condensations or building leaks. The Connections system only may be used in exterior applications.

1.8 WARRANTY

A. Ceiling System: 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:
1. Rust and manufacturing defects.

B. Warranty Period:
1. Ceiling System: One (1) year from date of installation.

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.

1.9 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. Ceiling Units: Furnish quantity of full-size units equal to 2.0 percent of amount installed.
2. Suspension System Components: Furnish quantity of each exposed suspension component equal to 1.0 percent of amount installed.

B. Deliver extra stock to Owner's representative.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Ceiling System:
1. Armstrong World Industries, Inc.

2.2 MATERIAL SPECIFICATION:

MetalWorks Linear:
A. Material: Electrogalvanized steel.
B. Finish: Post-production, powder-coat painted.
C. Thickness: 0.028 inch.
D. Size: Standard 4 inch, 8 inch, and 12 inch wide nominal panels including 1-1/4" reveal, 5/8 inch high x 8 feet long.
E. Edge Details: Square with extended flange.
F. Color: (White) (Gun Metal Grey) (Silver Grey) (Effects Maple) (Effects Cherry) (Effects Walnut) (Custom RAL colors)
G. Perforation Option: (Microperforated) (Unperforated)
H. Fire Rating: Class A, per IBC.
I. Acceptable Product: MetalWorks Linear (Connections) (Contrasts) System, as manufactured by Armstrong World Industries.

Accessories:
A. Item #5494: 1-1/4 inch wide black plastic filler strip to cover flange and create Contrasts look
B. Item #8200100: Fiberglass Infill Pad, 2 feet x 2 feet x 1 inch

2.3 SUSPENSION SYSTEMS

C. Carrier: Provide Item 5497 Standard Carrier or Item 5498 Flex Carrier, with Item 5499 Carrier Splices as needed for installation.
D. Hanger Wire: Minimum 12 gauge pre-stretched galvanized steel wire.
E. Hanger Clip: Provide item 5580 carrier steel clip to connect carriers to hanger wires.

2.4 ACCESSORIES

A. Panel Splices: For connecting 4 inch (item 5495); 8 inch (item 5496) or speed clips for 12 inch panels.
B. Panel End Caps: To close open end of panel on exposed installations: 4 inch (item 5581 _ _ _ _); 8 inch (item 5582 _ _ _ _); 12 inch for cut panels only (item 5583 _ _ _ _).
C. Trim Molding – Molding for Standard Carriers (item 5572 _ _ _ _) or Flex Carriers (item 5574 _ _ _ _).
D. Pressure Spring – item 5576 to use with trim molding.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Installer must inspect the area where the ceiling system is to be installed for conditions that may affect the work and notify the Contractor in writing of any unsatisfactory conditions before proceeding.
B. All work above the ceiling system is to be satisfactorily completed prior to start of the ceiling installation.
C. All unsatisfactory conditions potentially affecting the ceiling system are to be corrected prior to the start of ceiling installation.
D. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out.

3.2 PREPARATION

A. Verify and confirm ceiling layouts by actual field measurements to balance borders and minimize out-of-square conditions. Coordinate all work that penetrates the ceiling.
B. Ceiling systems shall be properly laid out per the manufacturer’s installation instructions or as shown on the approved shop drawings.
C. Cutouts for lights, speakers, sprinklers or other items can be done on site.

3.3 INSTALLATION

Install the suspended ceiling system in accordance with the manufacturer’s printed installation instructions, LA-297437; applicable industry standards; and local regulations and requirements in effect.

3.4 ADJUSTING AND CLEANING

Adjust ceiling components to provide a consistent finish and appearance in conformity with preestablished
tolerances and requirements. All panels showing signs of damage, either in finish or in
form are to be replaced. All exposed surfaces are to be cleaned of any dirt, grease, fingerprints
and marks or other imperfections with cleaning materials recommended by the manufacturer

END OF SECTION

EXTERIOR LINEAR CEILING SPECIFICATION ON NEXT PAGE

SECTION 09 51 33

EXTERIOR METAL LINEAR 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. Metal Linear ceiling panels.
   2. Grid suspension system, and Standard Carrier
   3. Wire hangers, fasteners, main runners, cross tees, wall angle moldings and accessories.

B. Related Sections:
   1. Section 09 51 00 (09510) - Acoustical Ceilings
   2. Section 09 20 00 (09250) - Plaster and Gypsum Board
   3. Divisions 23 (15) - HVAC
   4. Division 26 (16) Sections - Electrical Work

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 which have not been approved by Addenda, the specified products shall be provided without additional compensation.
   2. Submittals which 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 neccessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); Factory Mutual 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 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
   2. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
   3. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
   4. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
   5. UL580 Tests for Uplift Resistance of Roof Assemblies

B. International Code Council Evaluation Services

AC156- Acceptance Criteria for Seismic Qualification Testing of Non-Structural Components

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical data for each type of ceiling unit and suspension system required.
B. Installation Instructions: Submit manufacturer's installation instructions as referenced in Part 3, Installation.
C. 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.
D. Shop Drawings: Layout and details of ceilings. Show locations of items which are to be coordinated with, or supported by the ceilings.
E. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.

1.5 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide ceiling panel units and grid components by a single manufacturer.
B. Fire Performance Characteristics: Identify ceiling components with appropriate markings of applicable testing and inspecting organization.
    1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
        a. Flame Spread: 25 or less
        b. Smoke Developed: 50 or less
C. Coordination of Work: Coordinate ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.
D. Seismic Performance: System Seismic performance verified through full scale testin in accordance with ICC-ES-AC156 Acceptance Criteria for seismic Qualification Testing of Non Structural Compnents.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver 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. Handle ceiling units carefully to avoid damaging units in any way.

1.7 PROJECT CONDITIONS

A. MetalWorks Linear, Items #5490M1 (nonperforated) and #5491M1 (nonperforated) are recommended for exterior applications except in geographical areas with high concentrations of acid rain. They are not recommended for use in indoor pool applications.

1.8 WARRANTY

A. Armstrong MetalWorks Linear Ceiling Panels and Exterior Applications Suspension Systems when installed together as a system for exterior use are warranted to be free from defects in materials or factory workmanship, and against the occurrence of 50% red dust as defined by ASTM B 117 test procedures for one (1) year from the date of installation.

1.9 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. 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.

2.1 MANUFACTURERS

A. Ceiling Panels:
    1. Armstrong World Industries, Inc.
B. Suspension Systems:
    1. Armstrong World Industries, Inc.

2.2.0 METAL CEILINGS PANELS

A. Ceiling Panels Type ACT-1:

1. Surface Texture: Smooth
2. Composition: Electorgalvanized Steel
3. Color: WH, SG,MY, FXMP, FXCH, FXDC – Post Production, Powder-coat painted both sides
4. Size: 4” x 96” 8” x 96” Nominal panels including 1-1/4” reveal x 5/8”H
5. Edge Profile: Square with Extended Flange
6. Noise Reduction Coefficient (NRC) N/A
7. Ceiling Attenuation Class (CAC) N/A
8. Articulation Class (AC) N/A.
9. Fire Rating- Class A per IBC
10. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.77.
11. Dimensional Stability: Standard
12. Acceptable Product: MetalWorks Linear for Exterior Applications, (5490_____), (5491_____), (5492_____), (5493_____) as manufactured by Armstrong World Industries.

2.2.1 SUSPENSION SYSTEMS

A. Components: Provide Carrier Item 5497 Standard Carrier with item 5499 Splices as needed for installation.
B. Main beams and cross tees, base metal and end detail, fabricated from commercial quality hot dipped galvanized steel (G90) complying with ASTM A 653. Main beams and cross tees are double-web steel construction with 1-1/2” inch type flange design.
    1. Structural Classification: ASTM C 635 Heavy Duty and severe environmental performance.
C. Exterior Application:
    1. HD8906G90 DGS Main Beam 144” X 1-1/2” X 1-11/16”
    2. XL8926G90 DGS Cross Tee, 24”X1-1/2”X1-1/2”
    3. 1-5/8” 20 gauge Track
    4. 5495 Linear Splice (4”) 5496 Linear Splice (8”)
    5. 5497 Standard Carrier
    6. 5572 Standard Carrier Molding
    7. 5576 Linear Pressure Spring

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.

3.3 INSTALLATION

A. Install suspension system and panels in accordance with UL580, installation instructions, LA297437 for MetalWorks Linear for exterior applications, ASTM C636, and in compliance with the authorities having jurisdiction.

3.4 ADJUSTING AND CLEANING

A. Replace damaged and broken panels.
B. Clean exposed surfaces of ceilings panels, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION