



SECTION 09 54 16 – Luminous Ceiling System

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Perforated metal ceiling panels
 - 2. Suspension systems
 - 3. Accessories: provide other necessary items including devices for attachment overhead construction, secondary members, splines, splices, connecting clips, and other devices required for a complete installation.
 - 4. Supplemental support framing: Provide fully engineered secondary framing as required to meet code, conforming to layout shown in drawings, to support direct-hung metal ceilings suspension system.
- B. Related Sections:
 - 1. Sections 05 40 00 – Cold-Formed Metal Framing
 - 1. Section 12 11 13 – Edge-Illuminated [_____]: Wall-mounted units
 - 2. Sections 09 90 00 – Paintings and Coatings
 - 3. Division 23 – Heating, Ventilating and Air Conditioning
 - 4. Division 26 – Electrical [_____]: Power connections and installation of lamps [and power converters for LED lamps].
- C. Alternatives
 - 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; Component design, size, composition, color, and finish; Suspension system component profiles and sizes; Compliance with the referenced standards.

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1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. E 84 – "Standard Test Method for Surface Burning Characteristics of Building Materials"
 - 2. E 488 – "Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements"
 - 3. B 209 – "Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate"
 - 4. C 423 – "Sound Absorption and Sound Absorption Coefficients by Reverberation Room Method"
 - 5. E 580 – "Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Moderate Seismic Restraint"
 - 6. C 635 – "Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings"
 - 7. C 636 – "Recommended Practice for Installation of Metal Ceiling Suspensions Systems for Acoustical and Lay-in Panels"
 - 8. A 641 – "Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire"
 - 9. A 653 – "Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip process"
 - 10. E 1264 – "Classification for Acoustical Ceiling Products"
 - 11. E 1477 – "Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by use of Integrating-Sphere Reflectometers"
 - 12. D 1044 – "Practice for Abrasion Resistance"
 - 13. D 1002 – "Practice for Adhesion Resistance"
 - 14. System Description:
 - a. Wall to Wall Configurations

1.4 SUBMITTALS

- A. Product Data: Manufacturer's published literature, including specifications.
- B. Product Certification: Manufacturer's certifications that products comply with specified requirements and governing codes including product data, laboratory test reports and research reports showing compliance with specified standards.
- 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. Samples for Verification: Full-size units (or as specified below) of each type of ceiling assembly indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics. Submit samples for each type specified.
 - 1. 12" x 12" metal panel
 - 2. 6" long samples of each suspension component.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Lighting fixtures.

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2. Air outlets and inlets.
3. Speakers.
4. Sprinklers.

B. Field quality-control reports.

1.1 INFORMATIONAL SUBMITTALS

A. Embodied Carbon Submittals:

1. Completed Environmental Product Declaration Reporting Form for each principal product type in this Section.
2. For products with completed Environmental Product Declaration Reporting Forms claiming availability of an applicable EPD, provide the Product-Specific or Industry-Wide Type III Environmental Product Declaration (EPD) in compliance with ISO 14025.
3. The Contractor is advised that the submission of the embodied carbon EPD materials to the USGBC is not required.

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1.6 QUALITY ASSURANCE

- A. Manufacturer/Installer Qualifications:
 - 1. Provide metal ceiling system components produced by a single manufacturer with experience in actual production of specified products and with resources to provide consistent quality in appearance and physical properties, without delaying the work.
 - 2. Provide suspension system components produced by a single manufacturer to provide compatible components for a complete metal ceiling system installation.
 - 3. Perform installations using a firm with installers having no less than 3 years of successful experience on projects of similar size and requirements.
- B. Regulatory Requirements:
 - 1. Fire Rating Performance Characteristics: Install system to provide a flame spread of 0 - 25, complying with certified testing to ASTM E 84.
 - 2. Structural Criteria: Install and certify system to comply with structural and wind load requirements of governing codes.
 - 3. Installation Standard for Suspension System: Comply with ASTM C 636.
- C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Build mockup of typical ceiling area as shown on Drawings.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- D. Pre-installation Conference: Conduct a conference, prior to start of installation, to review system requirements, shop drawings, and all coordination needs.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver system components in manufacturer's original unopened packages, clearly labeled.
- B. Store components in fully enclosed dry space. Carefully place on skids, to prevent damage from moisture and other construction activities.
- C. Handle components to prevent damage to surfaces and edges, and to prevent distortion and other physical damage.

1.8 PROJECT CONDITIONS

- A. Begin system installations only after spaces are enclosed and weather-tight, and after all wet work and overhead work have been completed.
- B. Prior to starting installations, allow materials to reach ambient room temperature and humidity intended to be maintained for occupancy.

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1.9 WARRANTY

- A. Provide specified manufacturer's warranty against defects in workmanship, discoloration, or other defect considered undesirable by the Architect or Employer.
- B. This warranty shall remain in effect for a minimum period of one (1) year from date of initial acceptance.

1.10 MAINTENANCE & EXTRA MATERIALS

- A. Maintenance Instructions: Provide manufacturer's standard maintenance and cleaning instructions for finishes provided.
- B. Extra Materials: Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents. Only typical system components are included with attic stock.
 - 1. Metal Ceiling Panels: Full-size units equal to two percent (2%) of amount installed.
 - 2. Ceiling Suspension System Components: Quantity of each grid and exposed component equal to two percent (2%) of amount installed.

1.11 LEED

- A. Maxxit Metal Ceilings qualify for the following credits:
 - 1. Category - Material & Resources
 - a. MR Credit 2.1, 2.2 - Construction Waste Management Divert 50% or 75% from disposal
 - b. MR Credit 4.1, 4.2 - Recycled Content
 - c. MR Credit 5.1, 5.2 - Regional Materials (dependent on location)
 - 2. LEED NC - 10% Extracted, Processed & Manufactured Regionally
 - 3. LEED CI - 20% Manufactured Regionally
 - a. Category - Indoor Environmental Quality
 - 1) EQ Credit 4.1 to 4.6 - Low-Emitting Materials

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Agilis™ Back-lit ceiling panel system manufactured by Maxxit Ceilings & Walls: 1000 Martin Grove Rd, Toronto, ON M9W 4V8 Phone 905-206-9349.
- B. Substitutions not permitted.

2.2 SYSTEM MATERIALS

- A. Agilis™ Back-lit ceiling system for interior installations providing 15"/16" HD grid

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Material thickness per manufacturer's recommendations.

- B. Panel Profiles – Aluminum sheet, mechanically formed
- C. Dimensions
 - 1. Standard:
 - a. 24” x 24”, 24” x 48”
 - 2. Custom:
 - a. Panels
 - b. Lengths up to 72’ long
 - c. Widths up to 36”
- D. Ceiling Panels
 - 1. Ceiling Panel Type – Agilis Back-lit Panels
 - 2. Color: ‘Standard’, ‘Color Matched’
 - 3. Size: panel - Width, Depth, Length
 - 4. Perforation Option: Standard, Custom
 - 5. Flame Spread: ASTM E 1264; Class A (HPVA).
 - 6. Recycle Content: Post-Consumer - 24.3% Pre-Consumer – 51.8%
 - 7. Acceptable Product: Agilis Back-lit Panels manufactured by Maxxit
- E. Suspension:
 - 1. Panels can be suspended from standard Heavy Duty 15/16” Grid
 - a. HD grid features a 15/16” face width and surface painted cap that is widely used in interior designs today. Contains G30 galvanized steel with load carrying capacity of heavy duty and intermediate duty per ASTM C635.
 - b. Finish: (Black)(White)(Other: _____)
 - c. Torsion spring connector positively locks panel in place and releases it to allow for plenum access.
- F. Static White lighting
 - a. Lumens: 2000-2200 lm/panel
 - b. Color Temperature: 3200K-7100K
 - c. Beam angle: 175°
 - d. Operating Temperature: -40 °C (-40 °F) ~ +60 °C (+140 °F)
 - e. Input Voltage: 24V DC
 - f. Power consumption: 16 watts/panel
 - g. CRI: up to 84
 - h. Efficacy: 157 lm/w
- G. RGBW lighting
 - a. Lumens: 1800 lm/panel
 - b. Color Temperature: up to 6500K (white), Red, Green, Blue
 - c. Beam angle: 117°
 - d. Operating Temperature: -20 °C (-4 °F) ~ +60 °C (+140 °F)
 - e. Input Voltage: 24V DC
 - f. Power consumption: 72 watts/panel
 - g. CRI: 80+
- H. Perforations available:
 - 1. Perforation Patterns: design dependent

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- I. Panel Finish:
 - 1. Paint; color to be selected by architect
 - a. Powder Coat
 - b. Decorated Wood-Look Powder Coat
 - c. Laminated Film
 - 2. Stainless Steel

2.3 ACCESSORY MATERIALS

- A. Torsion spring fasteners
- B. POWER ADAPTORS OPTIONS -Hardwire, 5 in 1 Driver
- C. CONTROLLER OPTIONS- DMX decoder, power repeater

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and structural framing to which metal panels attach or abut, with installer present, for compliance with requirements specified in this and other Sections that affect installation and anchorage, and other conditions affecting performance of metal panel ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordination: Furnish layouts for cast-in-place anchors, clips, and other ceiling anchors whose installation is specified in other Sections.
- B. Survey substrate for wall attachment to assure squareness and proper elevation for panel installation.

3.3 INSTALLATION

- A. General: Install metal panel ceilings, per manufacturers shop drawings provided, per manufacturer's written instructions and to comply with publications referenced below.
 - 1. CISCA "Ceiling Systems Handbook"
 - 2. Standard for Ceiling Suspension System Installations - ASTM C 636
 - 3. Standard for Ceiling Suspension Systems Requiring Seismic Restraint - ASTM E 580
 - 4. IBC (International Building Code) Standard for Seismic Zone for local area

- B. Suspend ceiling hangers from building's approved structural substrates and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counter-splaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produce hanger spacings that interfere with location of hangers at spacing required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Utilize supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 - 4. Where used secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure; that are appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 5. Space hangers not more than 48" on-center, along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 12" from ends of each member. Supply supporting calculations from licensed Structural Engineer verifying hanger spacing meets all requirements, when spacing exceeds those recommended.
 - 6. Level grid to 1/8" in 10' from specified elevation(s), square and true.
 - 7. Adjust suspension system runners so they are square (within .5 degree from 90 degrees) and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

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C. WIRING

1. Determine your system components, including a 24 V Class 2 power adapter, as well as optional dimmer and controller. **WIRING WITH PLUG-IN POWER ADAPTERS:** • Use a plug-in adapter to connect the light to your power source. **WIRING WITH HARDWIRE POWER ADAPTERS:** 1. Turn off power to your system at the main breaker; 2. Install your system components. Refer to wiring guidelines for each component to build your system; 3. Check connections and turn on power at the main breaker.

3.4 ADJUST AND CLEAN

- A. Adjust components to provide uniform tolerances.
- B. Replace all ceiling components that are scratched, dented or otherwise damaged.
- C. Clean exposed surfaces with non-solvent, non-abrasive commercial type cleaner.

3.5 CLEANING

- A. Clean exposed surfaces of suspended decorative grids, including trim and edge moldings, after removing strippable, temporary protective covering if any. Comply with manufacturer's written instructions for stripping of temporary protective covering, cleaning, and touchup of minor finish damage. Remove and replace grid components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented and deformed grids.

END OF SECTION 09 54 16