



## SECTION 09 54 23 – Beam and Baffle 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 and non-perforated metal ceiling baffles and beams
  - 2. Acoustical infill
  - 3. Suspension systems
  - 4. 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.
  - 5. 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
  - 2. Sections 09 20 00 – Plaster and Gypsum Board
  - 3. Sections 09 50 00 – Acoustical Ceilings
  - 4. Sections 09 90 00 – Paintings and Coatings
  - 5. Division 23 – Heating, Ventilating and Air Conditioning
  - 6. Division 26 – Electrical
- C. This section covers the general requirements only for Acoustical Metal Ceilings as shown on the drawings. The supplying and installation of additional accessory features and other items not specifically mentioned herein, but which are necessary to make a complete installation, shall also be included or clarified accordingly.
- D. Qualification Data:
  - 1. Test Reports: Certified reports from independent agency substantiating structural compliance to governing requirements.
  - 2. Certificates:
    - a. Data substantiating manufacturer and installer qualifications.
    - b. Certified data attesting fire rated materials comply with specifications.
  - 3. Manufacturer's Instructions: Detailed installation instructions and maintenance data.

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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"
- B. LEED-CI 2009: Applicable LEED Environmental Categories and Credits and performance requirements as indicated in LEED for Commercial Interiors 2009:
1. Material and Resources (MR)
    - a. MRc4 – Recycled Content
    - b. MRc5 – Regional Materials
    - c. MRc7 – Certified Wood
  2. Indoor Environmental Quality (IEQ)
    - a. IEQc4.1 – Low-Emitting Materials – Adhesives & Sealants
    - b. IEQc4.2 – Low-Emitting Materials – Paints & Coatings
    - c. IEQc4.4 – Low-Emitting Materials – Composite Wood & Agrifiber
    - d. IEQpc24 – Acoustics
- C. LEED v4 ID+C: Applicable LEED v.4 Environmental Categories and Credits and performance requirements as indicated in LEED v4 for Interior Design + Coordination:
1. MR Credit: Building Product Disclosure & Optimization – EPD
  2. EQ Credit: Low-Emitting Materials
  3. EQ Credit: Indoor Air Quality Assessment
  4. EQ Credit: Acoustic Performance

## 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.

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- C. Shop Drawings: Layout and details of acoustical ceilings show locations of items that are to be coordinated with or supported by the ceilings.
  - 1. Reflected Ceiling Plan(s): Indicating metal ceiling layout, ceiling mounted items and penetrations.
  - 2. Suspension System, Carrier and Component Layout.
  - 3. Details of system assembly and connections to building components.
  
- 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. 11" square metal panel units.
  - 2. 11" long samples of each exposed molding or trim.
  - 3. 11" long samples of each suspension component.

## 1.5 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. Mock-Up: Prior to beginning installation erect a mock-up section, where directed, using all system components.
  
- D. Pre-installation Conference: Conduct a conference, prior to start of installation, to review system requirements, shop drawings, and all coordination needs.

## 1.6 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.

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## 1.7 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.

## 1.8 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.

## 1.9 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. Acoustical Metal Ceiling Beams: 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.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Agilis™ Beam and Baffle ceiling system manufactured by Maxxit Ceilings & Walls: 200 Admiral Blvd. Mississauga, ON L5T 2N6. Phone 905-206-9349.
- B. Substitutions not permitted.

### 2.2 SYSTEM MATERIALS

- A. Agilis™ Beam & Baffle ceiling system for interior installations providing Hang Wire suspension systems. Material thickness per manufacturer's recommendations.
- B. Baffle & Beam Profiles – Aluminum sheet, mechanically formed
- C. Dimensions
  - 1. Standard:

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- a. 1-1/2" x (4"-6"-8"-10")
  - b. 2" x (4"-6"-8"-10")
  - c. Up to 12' long
  2. Custom:
    - a. Baffles & Beams
    - b. Lengths up to 12' long
    - c. Depths up to 15"
    - d. Widths up to 24"
  3. Spacing between beams determined by design
- D. Ceiling Beams & Baffles
1. Ceiling Beams and Baffles Type – Agilis Open Cell
  2. Color: 'Standard', 'Color Matched'
  3. Size: Beam - Width, Depth, Length
  4. Perforation Option: Standard, Custom
  5. Noise Reduction Coefficient (NRC):
  6. Flame Spread: ASTM E 1264; Class A (HPVA).
  7. Recycle Content: Post-Consumer – 24.3% Pre-Consumer – 51.8%
  8. Acceptable Product: Agilis Open Cell manufactured by Maxxit
- E. Suspension:
1. Hangers:
    - a. Hanger Wire: 12 gauge galvanized carbon steel hanger wire.
    - b. Threaded Rod
    - c. Aircraft Cable
- F. Perforations available on painted finish options only:
1. Non-Perforated
  2. Perforation Patterns: .063" to .125" diameter standard;
- G. Baffle & Beam Finish:
1. Paint; color to be selected by architect
    - a. Applied Polyester
    - b. Powder Coat
    - c. Decorated Wood-Look Powder Coat
  2. Vinyl Film
  3. Stainless Steel

## 2.3 ACCESSORY MATERIALS

- A. End Caps: End caps to match beam finish
- B. Hanger Brackets: Splice/hanger bracket connector
- C. Acoustic material options include: Polyester Felt, Non-woven black fabric, Non-woven black fabric w/ 1" thick glass fiber, 1 1/2 pcf density, poly wrapped, 1" thick glass fiber, 1 1/2 pcf density poly wrapped.
  1. Apparent NRC Rating: .60 - 1.00 range - material dependent

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## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and structural framing to which acoustical metal beams 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 baffle & beam installation.

### 3.3 INSTALLATION

- A. General: Install metal baffle & beam 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.

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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.

## 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

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 23**