Part 1 General

1.01 RELATED SECTIONS

.1 Section 09 21 16 - Gypsum Board Assemblies.

.2 Section 09 51 13 - Acoustical Ceiling Panels.

1.02 REFERENCES

.1 American Society for Testing and Materials (ASTM International).

.1 ASTM A641/A641M-09a(2014). Standard Specification for Zinc–Coated (Galvanized) Carbon Steel Wire.

.2 ASTM A653/A653M-15e1. Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.3 ASTM C635/C635M-13a. Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

.4 ASTM C636/C636M-13. Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.

.5 ASTM E580/E580M-16. Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.

1.03 DESIGN REQUIREMENTS

.1 Maximum deflection: 1/360th of span to ASTM C635 deflection test.

.2 Load capacity. In addition to its own weight, ensure that suspension system is capable of supporting weight of all ancillary and related components of the ceiling assembly including components likely to impose loads on the assembly or its various parts at any point.

.3 Seismic: comply with ASTM E580 and NBC requirements related to seismic forces. Provide lateral restraint to ensure system does not experience lateral displacement during an event in accordance with NBC.

1.04 SUBMITTALS

.1 Provide Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit technical data sheets for each product used.

.3 Shop Drawings: Submit reflected ceiling plans. Indicate layout, insert and hanger spacing and fastening details, splicing method for main and cross runners, location of access splines, change in level details, access door dimensions, and locations and acoustical unit support at ceiling fixture. Clearly indicate and provide detail layout variations. Indicate lateral bracing and accessories.

.4 Indicate locations of all mechanical, electrical and equipment on ceiling. Respect indications on drawings and symmetry and alignment rules.

.5 Provide technical data indicating traction and compression forces of the main ‘T’ splices and of the secondary ‘T’ connections, and of special components for expansion. Provide test reports from independent testing laboratories confirming this data.

.6 Provide independent seismic certification from a Professional Engineer registered in Province of Ontario. Certify that the design of the ceiling systems conform to ASTM E580 and NBC requirements related to seismic forces.

.7 Submit samples. Submit one representative model of each type of ceiling suspension system. System to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

.8 Provide manufacturer's written certification that products submitted meet or exceed all specified requirements.

1.05 MOCK-UP

.1 Construct Mock-Ups in accordance with Section 01 45 00 - Quality Control.

.2 Construct Mock-Up of one completed ceiling. Mock-Up to demonstrate typical installation of ceiling suspension components including ceiling panels, trim and accessories. Minimum size: 10 square meters minimum.

.3 Construct Mock-Ups where directed by Consultant. Allow for inspection of Mock-Up by Consultant before proceeding with additional ceiling work. When accepted, Mock-Up will demonstrate minimum standard for this work. Approved Mock-Up may remain as part of the finished work.

1.06 DELIVERY, STORAGE AND HANDLING

.1 Delivery of ceiling products will be in the original unopened packages with the manufacturer's label intact

.2 Handling and storage should be in accordance with the manufacturer's Material Safety Data Sheets (MSDS).

1.07 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction / Demolition Waste Management.

Part 2 Products

2.01 MATERIALS

.1 Ceiling suspension systems to be provided by same manufacturer of Acoustical Panels as specified in Section 09 51 13 - Acoustical Ceiling Panels.

.2 **TYPE 1**: seismic rated suspension system: to ASTM C635. Non fire rated, two directional exposed tee bar. Structural Classification: Heavy Duty. 24 x 48 inch grid. Components die cut. Maximum hanger spacing: 48 inches.

.1 Materials: commercial quality, hot-dipped galvanized steel to ASTM A653. Exposed surfaces chemically cleansed and prefinished with baked polyester paint.

.2 Main beams and cross tees: double web steel construction with exposed flange design. Fabricate main beams and cross tees with rotary stitching.

.3 Colour: white. (WH). Colour to match the colour of the specified ceiling panels as specified in Section 09 51 13 - Acoustical Ceiling Panels.

.4 Face profile: 9/16 inches. Web height: 1- 11/16 inches.

.5 Acceptable Materials: SUPRAFINE XL. High Recycled Content by Armstrong.

.3 Wall Moulding: matching reveal type moulding to create shadow at perimeter of ceiling. Hemmed with prefinished exposed flanges. Seismic rated.

.4 Attachment devices: size for five times design load indicated in ASTM C635, Table 1. Direct hung.

.5 Hanger wire: to ASTM A641. Soft annealed wire with a yield stress load of a minimum of three times the design load. Minimum 12 gauge. Class 1 zinc coating.

.6 Carrying channels: 38 x 65 mm channel, of 1.6 mm thick galvanized steel.

.7 Accessories: splices, clips, wire ties, retainers and wall moulding corners, to complement suspension system components, as recommended by system manufacturer.

Part 3 Execution

3.01 INSTALLATION

.1 Install ceiling suspension system in accordance with ASTM C636 except where specified otherwise.

.2 Install ceiling suspension system in accordance with ASTM E580 except where specified otherwise.

.3 Install ceiling suspension system in accordance with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and datasheet.

.4 Do not erect ceiling suspension system until work above ceiling has been inspected by Consultant, or until any and all unacceptable conditions have been rectified.

.5 Secure hangers to overhead structure using attachment methods acceptable to Consultant.

.6 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.

.7 Lay out system in accordance with reflected ceiling plan. Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter, with border units not less than 50% of standard unit width.

.8 Ensure suspension system is co-ordinated with location of related components.

.9 Install wall moulding to provide correct ceiling height.

.10 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles and speakers.

.11 Support at light fixtures and diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

.12 Interlock cross member to main runner to provide rigid assembly.

.13 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.

.14 Finished ceiling system to be square with adjoining walls and level within 1:1000.

.15 Expansion joints. Erect two main runners parallel, 25 mm apart, on building expansion joint line. Lay in strip of acoustic panel, painted black, 25 % narrower than space between 2 'T' bars.

3.02 CLEANING AND MAINTENANCE

.1 Touch up scratches, abrasions, voids and other defects in painted surfaces.

.2 Clean any and all exposed surfaces in accordance with manufacturer's printed instructions.

.3 Replace any and all damaged ceiling system components.

3.03 SCHEDULE

.1 TYPE 1: Use with Acoustical Ceiling Panels ACT.

END OF SECTION