

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 05 50 00 - Metal Fabrications.
- .2 Section 06 10 00 - Rough Carpentry.
- .3 Section 07 21 16 - Blanket Insulation.
- .4 Section 07 84 00 - Firestopping.
- .5 Section 07 92 00 - Joint Sealing.
- .6 Section 09 21 16 - Gypsum Board Assemblies.
- .7 Section 09 22 16 – Non-structural Metal Framing.
- .8 Section 09 91 23 - Interior Re-painting

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C635/C635M-13a, Standard Specifications for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - .2 ASTM C636/C636M-13a, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
 - .3 ASTM C645 - 14e1, Standard Specification for Nonstructural Steel Framing Members.
 - .4 ASTM A653 / A653M - 15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .5 ASTM E580/E580M–14, Practice for Application of Ceiling Suspension Systems for Acoustic Tile and Lay-in Panels in Areas Requiring Seismic Restraint
 - .6 ASTM E1264-14, Standard Classification for Acoustical Ceiling Products
- .2 CSA Group
 - .1 CSA B111-74 (R2003), Wire Nails, Spikes and Staples.Ceiling Systems Installation Handbook (CISCA)
- .3 American National Standard Institute (ANSI)/Illuminating Engineering Society of North America (IESNA)
 - .1 ANSI/IESNA RP-1-12, American National Standard Practice for Office Lighting.
- .4 CISCA Ceilings & Interior Systems Construction Association::
 - .1 Ceiling systems handbook
 - .2 Guidelines for seismic restraint for direct-hung suspended ceiling assemblies
 - .3 Recommendations for direct-hung acoustical tile and lay-in panel ceilings

1.3 CALCULATION CRITERIA

- .1 Maximum flexion: deflection of 1/360 of scope, determined by flexion tests prescribed in ASTM C 635 and ASTM E580.
- .2 Contractor is responsible of reassembling the ceilings to its original state, once the envelope repair work are completed.

1.4 REQUIREMENTS OF REGULATORY BODIES

- .1 Floor/ceiling and roof/ceiling assemblies with fire resistance ratings: certified by a Canadian certification body accredited by Standards Council of Canada.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for ceiling assemblies and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit samples of integrated ceiling components as follows:
 - .1 Duplicate full size samples of each type of acoustical units.
 - .2 One representative model of each type of ceiling suspension system

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect ceiling assembly materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.7 SITE CONDITIONS

- .1 Dry materials that give off moisture before starting work
- .2 Maintain temperature between 15 ° and 30 ° C and a relative humidity between 20 and 40% where the materials will be installed, before and during work.
- .3 Store materials where materials will be installed for 48 hours prior to installation.
- .4 In order to avoid mold, maintain relative humidity at no less than 70%.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

Part 2 Products**2.1 DESCRIPTION**

- .1 Suspended ceiling system incorporating acoustical, lighting, air distribution, sprinkler and fire protection rating as integral part of system.
- .2 Tiles and suspension must come from a single manufacturer.

2.2 MATERIALS

- .1 Tiles and suspension must come from a single manufacturer.
- .2 Metal suspension: intermediate duty system to ASTM C635, cold-rolled steel, commercial grade.
- .3 The integrated ceiling assemblies are to be dismantled, preserved, and reassembled once the envelope repair works are completed. The contractor will replace every damaged element (suspension or acoustical tiles) during construction.
 - .1 Suspension system for acoustical tiles:
 - .1 T suspension, exposed 24 mm, medium resistance, to ASTM C 635.
 - .2 Height: 38 mm.
 - .3 Material: hot-dipped galvanized steel, commercial grade.
 - .4 Finish: polyester paint, baked, white colour.
 - .5 Main tee for tiles: double-thick core, medium load, to ASTM C635.
 - .6 Secondary tee: double-thick core, bearing capacity of 18.6 kg/ml, medium.
 - .7 Perimeter trim, minimum dimension 24 mm x 24 mm, to meet vertical surface.
 - .8 Colour: white.
 - .2 Acoustic tiles :
 - .1 TA1 tiles: (Dune)
 - .2 Material: hydroformed mineral fibre, finished in acrylic latex paint, factory-applied, 610 mm x 1220 mm x 16 mm, square edges, white, to ASTM E-1264.
 - .3 Type: III
 - .4 Shape: 2.
 - .5 Texture: medium.
 - .6 Pattern: C E
 - .7 Noise reduction coefficient (NRC): 0.50.
 - .8 Ceiling transmission loss index (CAC): 33.

- .9 Light reflection (LR) index: 0.83.
- .10 Resistant to sagging in damp conditions.
- .11 Treated against mould and bacteria.
- .12 Resistant to shocks and scratches.

2.3 ACCESSORIES

- .1 Staples, nails and screws: to CSA B111, anti-corrosion finish, based on recommendations from manufacturer of acoustic items.
- .2 Assembly clips: specially designed to secure tiles to suspension frame. May be used in an installation with a fire resistance rating.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for ceiling assemblies installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
 - .4 Start installation of suspensions and acoustic tiles after inspecting installations to be concealed by ceiling and after receiving written approval from Departmental Representative.

3.2 INSTALLATION

- .1 Contractor is responsible of reassembling the ceilings to its original state, once the envelope repair work is completed.
- .2 Install integrated ceiling suspension system to ASTM C636 and E580 with hangers supported from building structural members at indicated heights.
- .3 Install suspension frames in accordance with manufacturer's instructions and calculation criteria tested by certification bodies.
- .4 Do not erect ceiling suspension system until anchors, blocking, sound or fire barriers, electrical and mechanical work above ceiling are inspected and approved by Departmental Representative
- .5 Fix the suspension to the upper frame using the mounting methods consistent with indications.
- .6 Ensure suspended system is co-ordinated with location of related components.
- .7 Install suspension assembly to upper frame using mounting methods consistent with UL indications.

- .8 Install electrical light fixtures and air diffusers to manufacturer's instructions. Provide stabilizing reinforcement at 150 mm at most from each angle, and at every 600 mm at most all around device.
- .9 Install acoustic units, detectors, speakers, light fixtures, in suspension system as per details.
- .10 Ensure ceiling is free of finger marks and, for the new tiles, touch-up scratched surfaces with field painting to match, supplied by manufacturer.
- .11 Install removable sections in sufficient quantity to ensure access to ceiling space on a surface equal to 50% of surface of suspended ceiling.
- .12 Ridges of finished ceiling must be square along walls, and must not have flatness deviation greater than 1:1000.
- .13 Produce expansion seals as indicated.
- .14 Installation in accordance with recommendations of CISCA and National Building Code for areas subject to light to moderate seismic activity (zones 0 to 2).
 - .1 Lattice must not be attached to wall trim.
 - .2 There must be 10 mm play on all sides.
 - .3 Lattice must overlap wall trim by 10 mm.
 - .4 Ends of girders and crossed tees must be tied together to keep them from separating.
 - .5 No suspension wire may be installed at perimeter.
 - .6 Suspension wire must be twisted at least three (3) turns on themselves, at both ends of their mooring.

3.3 INSTALLATION OF ITEMS ON SUSPENSION FRAME

- .1 Place panels and acoustic tiles on suspension frame.
- .2 Place fibrous absorbent material on entire hidden side of suspension frame.
- .3 For ceilings with fire resistance rating, attach panels on visible frame using assembly clips. On ceiling mounts, diffusers, return air grilles and other devices, protect them in accordance with requirements of certification bodies.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by ceiling assemblies installation.

END OF SECTION