SECTION 09 54 26 – suspended wood ceilings

1. General
   1. Summary
      1. This Section includes requirements for supply and installation of acoustical wood panel systems into a suspended ceiling grid for interior installations.
   2. Reference Standards
      1. American National Standards Institute (ANSI):
         1. ANSI A208.2‑1994, Medium Density Fiberboard for Interior Use.
      2. American Society for Testing and Materials (ASTM):
         1. ASTM C423‑06, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
         2. ASTM C635‑04, Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustic Tile and Lay‑in Panel Ceilings.
         3. ASTM C636‑06, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustic Tile and Lay‑In Panels.
         4. ASTM E580/E580M‑06, Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay‑in Panels in Areas Requiring Seismic Restraint.
      3. Canadian Hardwood Plywood Association (CHPA):
         1. CHPA Official Grading Rules for Canadian Hardwood Plywood (1993).
         2. CHPA Official Grading Rules for Rotary Cut Birch, Oak and Maple Veneers (June 1986).
      4. Ceilings & Interior Systems Construction Association (CISCA):
         1. CISCA Ceiling Systems Handbook.
      5. Hardwood Plywood and Veneer Association (HPVA):
         1. Hardwood Plywood Reference Guide and Sales Handbook.
      6. Underwriters Laboratories Canada (ULC):
         1. CAN/ULC S102‑03, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
   3. Administrative Requirements
      1. Coordination: Coordinate layout and installation of acoustic wood ceiling and suspension system with other construction that penetrates ceilings or is supported by them including but not limited to, light fixtures, HVAC equipment, fire suppression system, and partition assemblies, and as follows:
         1. Schedule and coordinate installation of ceiling to occur after completion of overhead mechanical and electrical work.
         2. Schedule and coordinate ceiling installation with mechanical and electrical trades building in components into ceiling finish panels.
      2. Pre‑Installation Conference: Conduct conference at Project site in accordance with requirements of Section 01 31 19 – Project Meetings, to discuss coordination issues with Contractor, Subcontractor and Consultant present.
   4. Submittals
      1. Provide required information in accordance with Section 01 33 00 – Submittal Procedures.
      2. Action Submittals: Provide the following submittals before starting any work of this Section:
         1. Product Data: Submit product data for each system specified for review by consultant including product test reports indicating compliance with specified acoustical performance requirements and meeting fire resistance requirements listed in this Section.
         2. Samples: Submit two (2) sets of samples to Consultant for verification of materials supplied to the project in sets for each colour, texture, and pattern specified, showing full range of expected variations expected as follows:
            1. Full size samples of each wood panel type, pattern, and colour.
            2. Set of 300 mm long samples of exposed suspension system members, including mouldings, for each colour and system type required.
      3. Informational Submittals: Provide the following submittals during the course of the work:
         1. Coordination Drawings: Submit coordination drawings including reflected ceiling plans drawn to scale and coordinating penetrations and ceiling mounted items indicating the following:
            1. Ceiling suspension system members.
            2. Method of attaching suspension system hangers to building structure.
            3. Ceiling mounted items including light fixtures; air outlets and inlets; speakers; sprinklers; and special mouldings at walls, column penetrations, and other junctures of acoustic ceilings with adjoining construction.
            4. Minimum Drawing Scale: 1 to 100
         2. Source Quality Control Testing: Submit fastener test results indicating that fasteners and anchors used to suspend the ceiling system have a minimum capacity of 890 N in tension and that anchors used to attach bracing wires have a minimum capacity of 1960 N in tension.
         3. Certificates: Submit written certification after completion of project for each product specified indicating compliance with acoustical and fire performance requirements signed by the panel manufacturer, and that materials supplied as components meet or exceed the specified requirements.
   5. Project Closeout Submissions
      1. Provide operations and maintenance information in accordance with Section 01 33 00 – Submittal Procedures.
         1. Submit specific maintenance practices indicating any materials that may damage or disfigure the finished Work.
   6. Quality Assurance
      1. Regulatory Requirements: Provide acoustical wood ceilings meeting flame spread and smoke developed requirements in accordance with ULC S102.
      2. Qualifications: Provide proof of qualifications when requested by Consultant:
         1. Installers: Use installers having proven experience in completing acoustical wood ceilings having similar material, design, and complexity as that required for this project and having a record of successful in‑service performance for the previous two (2) years.
         2. Manufacturers: Obtain materials from one source with resources to provide products from the same production run for each contiguous area of consistent quality in appearance and physical properties.
   7. Mock‑Ups
      1. Provide required Mock‑Ups in accordance with Section 01 45 00 – Quality Control.
      2. Construct mock‑ups for each type of ceiling and finish specified to demonstrate aesthetic effects and qualities of materials, and confirm installation requirements as follows:
         1. Locate mock‑ups in location and size as directed by Consultant.
         2. Notify Consultant seven (7) days in advance of dates when mock‑ups will be constructed.
         3. Mock‑up is intended to demonstrate the proposed range of aesthetic effects and workmanship.
         4. Obtain Consultant's acceptance of mock‑ups before starting construction of acoustical wood ceilings; make modifications to installation as directed by the Consultant.
         5. Maintain mock‑ups during construction in an undisturbed condition as a standard for judging the completed Work.
         6. Acceptable mock‑ups in an undisturbed condition at the time of Substantial Performance may become part of the completed Work.
   8. Delivery, Storage, and Handling
      1. Delivery and Acceptance Requirements: Deliver acoustical wood ceiling components to site in original, unopened packages and store in fully enclosed space, protected against damage from moisture, direct sunlight, surface contamination, and other causes, and when temperature and humidity of installation and storage areas approximate conditions that will exist when building is occupied.
      2. Storage and Handling Requirements: Allow acoustic wood ceiling components to reach room temperature and stabilized moisture content before installing; handle acoustic wood ceiling components to avoid chipping edges or damaging units in any way; replace damaged units when directed by Consultant.
   9. Site Conditions
      1. Site Measurements: Verify dimensions by site measurements before fabrication and indicate measurements on shop drawings where acoustical wood ceilings are indicated to fit between walls and other construction; coordinate fabrication schedule with construction progress to avoid delaying the Work.
      2. Established Dimensions: Establish dimensions and proceed with fabricating acoustical wood ceilings without site measurements where site measurements cannot be made without delaying the Work; coordinate construction to ensure that actual dimensions correspond to established dimensions; allow for trimming and fitting.
      3. Environmental Requirements: Perform installation when heating and cooling systems are operational, and temperature and humidity closely approximate the interior operating conditions required for the final construction; allow wood materials to acclimate and stabilize to site conditions and minimum of seventy-two (72) hours before installation when site is free of wet and dusty work, and above ceiling work is complete.
2. Products
   1. manufacturer
      1. Basis-of-Design Manufacturers: Manufacturers named in this Section were approved to provide work specified in this Section. Additional manufacturers offering similar products may be incorporated into the work of this Section provided they meet the performance requirements indicated and provided requests for substitution are provided a minimum of five (5) days in advance of Bid Closing.
      2. Approved manufacturers:
         1. Rulon International.
   2. Performance Requirements
      1. Determine the superimposed loads that will be applied to suspension systems by components of the building other than the ceiling and ensure that adequate hangers are installed to support the additional loads (light fixtures, mechanical ducts and similar items) as well as loads of the ceiling system itself to limit deflection to 1/360th of the span in accordance with ASTM C635.
      2. Manufacture and install components to provide minimum Noise Reduction Coefficient (NRC) listed for specified products; test in accordance with ASTM C423.
      3. Limit flame spread rating of materials supplied to the project and that are used in exits to 25 or less, with smoke developed at 450 or less when tested in accordance with CAN/ULC S102.
      4. Mechanical, electrical, and other utility services above the ceiling plane shall be completed. No materials should rest against, or wrap around, the ceiling suspension components or connecting hangers.
      5. Install only when the temperature and humidity closely approximate the interior conditions that will exist when the building is occupied. Heating and cooling systems shall be operating before, during, and after installation, with the humidity of the interior spaces maintained between 25 and 55 percent, and a temperature between 15 deg C and   
         30 deg C.
   3. Materials

SPEC NOTE: Edit the following CL# and product characteristics to reflect the materials that are identified in the Product and Finish Schedule.

* + 1. Acoustical Wood Ceiling Panel (CL-#):
       1. Grille Size: 305mm wide x 610mm to 3048mm long x 25mm thick.
       2. Wood strips are fabricated without finger-joints and fastened together with black dowels.
       3. Dowels are positioned 140 mm from the ends and 305 mm on center, with interconnecting male-to-female dowel attachment.
       4. Panel Design Description:
          1. Grilles consist of individual wood strips assembled in 305mm widths in lengths up to 3048mm. Wood strips are drilled 305mm on center, beginning 139mm from each end.
          2. Dowels are positioned perpendicular to the wood strips.
          3. Dowels are generally furnished black to be hidden from view. Dowel clips are used to snap the Panel Grilles into place.
       5. Blade Design: (B) Bullnose Blade.
       6. Trim and Border Treatment: Provide end caps or junction trims as indicated on the Drawings in the same species and finish as the Panel Grille.
       7. Wood Species: White Oak
       8. Finish: Custom stain as indicated in Section 09 06 05 – Product and Finish Schedule.
  1. Accessories
     1. C-Hangers: Suspension hangers that are direct-screwed to the panel and hang over the heavy duty-grid. Hangers are made of spring-steel with phosphate pre-treatment and corrosion-resistant coating.
     2. Torsion Springs and Saddle Clips: Two parts of a suspension system in which the torsion spring is direct-screwed to the panel and compressed to attach to the saddle clip that is fitted over the heavy duty-grid. Springs and clips are made of spring-steel with phosphate pre-treatment and corrosion-resistant coating.
     3. Dowel Clips: Clips are spring-steel with phosphate pre-treatment and corrosion-resistant coating and are attached by fitting around the dowel and attaching to the grid system.
     4. Z-Clips: Male/female aluminum attachment clips, used to hang wood wall panels on furring strips.
  2. suspension system

SPEC NOTE: If Section 09 51 13 – Acoustical Panel Ceilings is not required on the Project, please consult with the Spec Leader to provide information regarding the suspension system for this Section.

* + 1. Main Tees: Standard heavy duty 24mm (15/16”) tee bar grid face, as specified in   
       Section 09 51 13 – Acoustical Panel Ceilings.
    2. Hangers: shall be Suspend ceiling panels from T-rail using torsion springs, C-hangers, or direct screw attachment, as recommended by the manufacturer.

1. Execution
   1. EXAMINATION
      1. Examine substrates and structural framing for compliance with requirements specified in this and other Sections that affect ceiling installation, anchorage, and other conditions affecting performance of acoustical wood ceilings.
      2. Installation of ceiling system indicates acceptance of conditions.
   2. Preparation
      1. Measure each ceiling area and establish layout of wood panels to balance border widths at opposite edges of each ceiling:
         1. Install wood ceilings in accordance with layout indicated on reflected ceiling plans.
         2. Avoid using panels less than ½ width at borders.
   3. Installation
      1. Install acoustical wood ceilings in accordance with manufacturers written instructions and as follows:
         1. Install ceiling suspension system in accordance with ASTM C636.
      2. Suspend ceiling hangers from building's structural members, 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 means that prevents creating kinks in the suspension wires.
         3. Install supplemental suspension members and hangers, trapezes, or similar devices where width of ducts and other construction within ceiling plenum produces hanger spacing that interferes with location of hangers at required spacing to support manufacturer’s suspension system; size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
         4. Secure wire hangers to ceiling suspension members and to supports above using a minimum of three tight turns.
         5. Connect hangers directly to structure or to flat, angle, channel or rods securely fastened to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are:
            1. Secure.
            2. Appropriate for substrate.
            3. Will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
         6. Attach hangers to structural members or intermediate supports:
            1. Do not support ceilings directly from permanent metal forms or floor deck.
            2. Do not attach hangers to steel deck tabs.
            3. Do not attach hangers to steel roof deck.
         7. Space hangers at 1220 mm maximum along each member supported directly from hangers and provide hangers not more than 200 mm from ends of each member.
         8. Provide additional hangers where there are lay‑in electrical or mechanical fixtures, one at each corner and if required, stabilizer bars to prevent overloading or rotation of suspension members.
         9. Level ceilings by adjusting length of suspension wires; do not level ceilings by putting kinks in the suspension wires.
      3. Install edge mouldings and trim of type indicated at perimeter of acoustic ceiling area and where necessary to conceal edges of wood panels, and as follows:
         1. Mitre corners accurately and connect securely.
         2. Do not use exposed fasteners, including pop rivets, on mouldings and trim, unless specifically allowed by the Consultant.
      4. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
      5. Accurately fit and install wood panels into suspension system runners and edge mouldings:
         1. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
         2. Damaged panels will not be acceptable and shall be replaced.
   4. Cleaning
      1. Clean exposed surfaces of suspended unit ceilings, including trim, edge mouldings, and suspension system members.
      2. Comply with manufacturer's written instructions for cleaning and touch‑up of minor finish damage.
      3. Remove and replace ceiling components that cannot be successfully cleaned and repaired.

END OF SECTION