

**SECTION 09 51 00
ACOUSTICAL CEILINGS**

SPEC WRITER NOTE:

1. Delete text between // _____ // not applicable to project. Edit remaining text to suit project.
2. Coordinate with Section 09 06 00, SCHEDULE FOR FINISHES, to define texture, patterns, and colors other than white with locations in the room finish schedule and reflective ceiling plans.
3. Fire rated assemblies: Do not use except with special authorization. Limit use to existing structures where other means to achieve desired fire rating are not practical. This section does not include fire rated assemblies, include applicable UL systems and specify when permitted.
4. Section does not include acoustical plaster, spray or trowel applications and special panels or tile units such as "Structural cement-fiber Units" See UL listings; Units have flame spread of 20 and smoke developed of 0.
5. Verify the reflective ceiling plans show panel sizes and layouts with unusual conditions and tile ceilings.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Acoustical units.
 2. Metal ceiling suspension system for acoustical ceilings.
 3. Adhesive application.

1.2 RELATED REQUIREMENTS

SPEC WRITER NOTE: Update and retain references only when specified elsewhere in this section.

- A. Adhesive VOC Limits: Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS.
- B. Color, pattern, and location of each type of acoustical unit: Section 09 06 00, SCHEDULE FOR FINISHES.
- C. // Linear Metal Ceilings: Section 09 54 23, LINEAR METAL CEILINGS. //
- D. // Access doors in adhesive applied tile: Section 08 31 13, ACCESS DOORS AND FRAMES. //

- E. // Ceiling Suspension System: Section 09 22 16, NON-STRUCTURAL METAL FRAMING. //
- F. // Lay in gypsum board ceiling panels: Section 09 29 00, GYPSUM BOARD. //

SPEC WRITER NOTE: Make material requirements agree with applicable requirements specified in the referenced Applicable Publications. Update and specify only that which applies to the project.

1.3 APPLICABLE PUBLICATIONS

- A. Comply with references to extent specified in this section.
- B. ASTM International (ASTM):
 - 1. A641/A641M-09a(2014) - Zinc-coated (Galvanized) Carbon Steel Wire.
 - 2. A653/A653M-15e1 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-coated (Galvannealed) by the Hot-Dip Process.
 - 3. C423-09a - Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - 4. C634-13 - Terminology Relating to Environmental Acoustics.
 - 5. C635/C635M-13a - Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
 - 6. C636/C636M-13 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
 - 7. D1779-98(2011) - Adhesive for Acoustical Materials.
 - 8. E84-15b - Surface Burning Characteristics of Building Materials.
 - 9. E119-16 - Fire Tests of Building Construction and Materials.
 - 10. E413-16 - Classification for Rating Sound Insulation.
 - 11. E580/E580M-14 - Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
 - 12. E1264-14 - Classification for Acoustical Ceiling Products.
- C. International Organization for Standardization (ISO):
 - 1. ISO 14644-1 - Classification of Air Cleanliness.

1.4 PREINSTALLATION MEETINGS

- A. Conduct preinstallation meeting // at project site // minimum 30 days before beginning Work of this section.

SPEC WRITER NOTE: Edit participant list to ensure entities influencing outcome attend.

1. Required Participants:
 - a. Contracting Officer's Representative.
 - b. // Architect/Engineer. // and Interior Designer. //
 - c. // VA Interior Designer. //
 - d. // Inspection and Testing Agency. //
 - e. Contractor.
 - f. Installer.
 - g. // Manufacturer's field representative. //
 - h. Other installers responsible for adjacent and intersecting work, including // sprinkler // HVAC // and // lighting // installers.

SPEC WRITER NOTE: Edit meeting agenda to incorporate project specific topics.

2. Meeting Agenda: Distribute agenda to participants minimum 3 days before meeting.
 - a. Installation schedule.
 - b. Installation sequence.
 - c. Preparatory work.
 - d. Protection before, during, and after installation.
 - e. Installation.
 - f. Terminations.
 - g. Transitions and connections to other work.
 - h. Inspecting and testing.
 - i. Other items affecting successful completion.
3. Document and distribute meeting minutes to participants to record decisions affecting installation.

1.5 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submittal Drawings:
 1. Show size, configuration, and fabrication and installation details.
- C. Manufacturer's Literature and Data:
 1. Description of each product.
 2. Ceiling suspension system indicating manufacturer recommendation for each application.

3. Installation instructions.
 4. Warranty.
- D. Samples:
1. Acoustical units, 150 mm (6 inches) in size, each type, // including units specified to match existing. //
 - a. Submit quantity required to show full color // and texture // range.
 2. Suspension system, trim and molding, 300 mm (12 inches) long.
 3. Colored markers for access service.
 4. Approved samples may be incorporated into work.
- E. Sustainable Construction Submittals:

SPEC WRITER NOTE: Retain sustainable construction submittals appropriate to product.

1. Recycled Content: Identify post-consumer and pre-consumer recycled content percentage by weight.
 2. Biobased Content:
 - a. Show type and quantity for each product.
 - b. Show volatile organic compound types and quantities.
- F. Certificates: Certify // each product complies // products comply // with specifications.
1. Acoustical units, each type.
- G. Qualifications: Substantiate qualifications comply with specifications.
1. Manufacturer // with project experience list //.
- H. Operation and Maintenance Data:
1. Care instructions for each exposed finish product.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
1. Regularly manufactures specified products.
 2. Manufactured specified products with satisfactory service on five similar installations for minimum five years.
 - a. // Project Experience List: Provide contact names and addresses for completed projects. //

1.7 DELIVERY

- A. Deliver products in manufacturer's original sealed packaging.
- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, // color, // production run number, and manufacture date.

- C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.8 STORAGE AND HANDLING

- A. Store products indoors in dry, weathertight // conditioned // facility.
- B. Protect products from damage during handling and construction operations.

1.9 FIELD CONDITIONS

- A. Environment:
 - 1. Product Temperature: Minimum 21 degrees C (70 degrees F) for minimum 48 hours before installation.
 - 2. Work Area Ambient Conditions: HVAC systems are complete, operational, and maintaining facility design operating conditions continuously, beginning 48 hours before installation until Government occupancy.
 - 3. Install products when building is permanently enclosed and when wet construction is completed, dried, and cured.

1.10 WARRANTY

SPEC WRITER NOTE: Always retain construction warranty. FAR includes Contractor's one year labor and material warranty.

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Ceiling System: Acoustical ceilings units on // exposed // concealed // grid suspension systems.

2.2 SYSTEM PERFORMANCE

- A. Design product complying with specified performance:
 - 1. Maximum Deflection: 1/360of span, maximum.
- B. Fire Resistance: ASTM E119; as component of // 1 // 2 // hour rated // floor-ceiling // roof-ceiling assembly.
- C. Surface Burning Characteristics: When tested according to ASTM E84.

SPEC WRITER NOTE: Select flame spread rating to suit occupancy type, location within project, and sprinkler coverage.

1. Flame Spread Rating: // 25 // 75 // 200 // maximum.
2. Smoke Developed Rating: 450 maximum.

2.3 PRODUCTS - GENERAL

- A. Basis of Design: Section 09 06 00, SCHEDULE FOR FINISHES.
- B. Provide acoustical units from one manufacturer.
 1. Provide each product exposed to view from one production run.
- C. Provide suspension system from same manufacturer.
- D. Sustainable Construction Requirements:
 1. Mineral Base Recycled Content: // 65 // _____ // percent, // post-consumer // total // recycled content, minimum. // Select products with recycled content to achieve overall Project recycled content requirement. //

SPEC WRITER NOTE: Steel recycled content depends upon furnace type. AISC reports industry wide 32 percent for basic oxygen furnace and 93 percent for electric arc furnace.

2. Steel Recycled Content: 30 percent total recycled content, minimum.

SPEC WRITER NOTE: Aluminum Association (AA) reports 2008 industry average 85 percent recycled content for aluminum in building construction industry. Retain 50 percent when specifying anodized aluminum.

3. Aluminum Recycled Content: // 80 // 50 // percent total recycled content, minimum.
4. Biobased Content: 37 percent by weight biobased material, minimum.

SPEC WRITER NOTE:

1. Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS includes comprehensive product list setting VOC limits for low-emitting materials.
2. Retain subparagraphs applicable to products specified in this section.

5. Low Pollutant-Emitting Materials: Comply with VOC limits specified in Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS for the following products:

- a. Non-flooring adhesives and sealants.

2.4 ACOUSTICAL UNITS

A. General:

1. Ceiling Panel and Tile: ASTM E1264, bio-based content according to USDA Bio-Preferred Product requirements.
 - a. Mineral Fiber: 3.6 kg/sq. m (3/4 psf) weight, minimum.
 - b. // Integrally colored units. //
2. Classification: Provide type and form as follows:
 - a. Type III Units - Mineral base with water-based painted finish maximum 10 g/l VOC; Form 2 - Water felted, minimum 16 mm (5/8 inch) thick.
 - b. Type IV Units - Mineral base with membrane-faced overlay, Form 2 - Water felted, minimum 16 mm (5/8 inch) thick. Apply poly (vinyl) chloride over paint coat.
 - c. Type V Units - Perforated steel facing (pan) with mineral or glass fiber base backing.
 - 1) Steel: Galvanized steel, ASTM A653, with G30 coating. minimum 0.38 mm (0.015 inch) thick.
 - 2) Bonderize both sides. Apply two coats of baked-on enamel finish on surfaces exposed to view and one coat on concealed surfaces.
 - d. Type VI Units - Perforated stainless steel facing (pan) with mineral or glass fiber base backing.
 - e. Type VII Units - Perforated aluminum facing (pan) with mineral or glass fiber base backing.
 - 1) Aluminum sheets, minimum 0.635 mm (0.025 inch) thick.
 - 2) Apply two coats of baked-on enamel finish, free from gloss or sheen, on face and flanges.
 - f. NRC (Noise Reduction Coefficient): ASTM C423, minimum 0.55 unless specified otherwise.
 - g. CAC (Ceiling Attenuation Class): ASTM E413, 40-44 range unless specified otherwise.
 - h. LR (Light Reflectance): Minimum 0.75.

SPEC WRITER NOTE:

1. Acoustical tile or panel layouts and sizes on reflective ceiling plans are required with penetrations shown.
2. In a small project without sufficient penetrations to require a reflective

ceiling plan specify tile size for lay-in panels.

3. Lay-in panels: Sizes as indicated on Drawings, with // square edges // reveal edges //.
 - a. Sizes:
 - 1) Concealed Grid Upward Access System: // 300 by 300 (12 by 12) // // 300 by 600 mm (12 by 24 inch) //.
 - 2) Cross Score: 300 by 600 mm (12 by 24 inch) tile to simulate 300 by 300 mm (12 by 12 inch) tile edges.
 - 3) Edge and Joint Detail: // Beveled // Square // edges and joints as required to suit suspension and access system.
4. Perforated Metal Facing (Pan):
 - a. Tiles Size: // 300 by 300 (12 by 12) // 300 by 600 (12 by 24) // 300 by 900(12 by 36) // and // 300 by 1200 mm (12 by 48 inches) //.
 - 1) Cross Score Units: Larger than 300 by 300 mm (12 by 12 inches) to simulate 300 by 300 mm (12 by 12 inch) units.
 - 2) Edge and Joint Detail: Beveled edge, joints for snap-in attachment to suspension system.
 - b. Panels: Sizes as indicated on Drawings with // recessed reveal edges // flat panel with square edges to finish flush with exposed grid suspension system. //
 - c. Sound Absorbent Element: Non-sifting mineral wool or glass fiber (formaldehyde-free). Density and thickness to provide specified noise reduction coefficient. Enclose sound absorbent elements within plastic envelopes.
 - d. Support sound absorbent elements on wire spacer nominal 6 mm (1/4 inch) high. Fit sound absorbent element and the spacer into the unit.
5. Adhesive Applied Tile:
 - a. Size: 300 by 300 mm (12 by 12 inch) size.
 - b. Edges: // Beveled // Square //.

SPEC WRITER NOTE: Include Special Faced Acoustical Tile units AT (SP) for surgery/clean areas, kitchen, SPD, and wet areas. See PG-18-14, Room Finishes, Door & Hardware Schedule.

- B. SPECIAL FACED ACOUSTICAL TILE UNITS AT(SP): Anti-microbial coated surfaces suitable for use in Class 5 Clean Rooms per ISO 14644-1. Special faced acoustical tile units shall meet all general requirements stated in this specification.

SPEC WRITER NOTE:

1. When special type acoustical tile is required, include following subparagraphs and provide a detailed description of type of acoustical tile required.
2. Use special units in areas having high humidity conditions such as kitchens and hydrotherapy areas (swimming pools). Consider perforated aluminum facing units or ceramic units.
3. Use special IIIA units in open office spaces with higher NRC range, minimum of 0.75. Do not use glass fiber units. Combination units of glass fiber and mineral board acceptable.

1. Type XX-A Units - Perforated Ceramic Units for Wet Service.
 - a. Mineral wool material, fired in kiln to produce a stable panel, totally unaffected by moisture when submerged in water.
 - b. No damage when subjected to 10 cycles of steam at 135 degrees C (275 degrees F) and cooling to 10 degrees C (50 degrees F).
 - c. Minimum of 16 mm (5/8 inch) thick.
 - d. Not affected when immersed in five percent chlorine solution, except for paint finish.
2. Type III-A Units - Mineral base with painted finish.
 - a. Form 1, modular, cast or molded.
 - b. NRC: 0.75 minimum.
 - c. Thickness: 19 mm (3/4 inch) minimum.
 - d. Weight, 4.9 kg/sq. m (one pound per square foot).
3. Type XX-B Units - Combination mineral base and glass fiber with fabric finish.
 - a. Back Half of Panel: Perforated water felted mineral fiber.
 - b. Face Half of Panel: Glass fiber with glass cloth face.
 - c. NRC: 0.75 minimum.
 - d. Thickness: 28 mm (1 1/8 inches) minimum.

SPEC WRITER NOTE:

1. Make material requirements agree with applicable requirements specified in the referenced Applicable Publications.

2. Exposed grid for 600 mm X 1200 mm (2 by 4 feet) lay-in panels is preferred system for economy.
3. Do not use narrow exposed grid face suspension system for lay-in mineral base acoustical units. Minimum width is 22 mm (7/8) inch with 8 mm (5/16 inch) minimum bearing area for panel edge. No exceptions.

2.5 METAL SUSPENSION SYSTEM

- A. General: ASTM C635, // intermediate-duty // heavy-duty system, except as otherwise specified.
 1. Suspension System: Provide the following:
 - a. // Galvanized cold-rolled steel, bonderized. //

SPEC WRITER NOTE:

 1. Include aluminum for kitchen.
 2. Include aluminum or fire resistant plastic in toilets adjacent to shower areas, hydrotherapy and swimming pool.
 - b. // Extruded aluminum. //
 - c. // Fire resistant plastic (glass fiber). //
 2. Main and Cross Runner: Use same construction Do not use lighter-duty sections for cross runners.
- B. Exposed Grid Suspension System: Support of lay-in panels.
 1. Grid Width: 22 mm (7/8 inch) minimum with 8 mm (5/16 inch) minimum panel bearing surface.
 2. Molding: Fabricate from the same material with same exposed width and finish.
 3. Finish: Baked-on enamel flat texture finish.
 - a. Color: To match adjacent acoustical units unless specified otherwise in Section 09 06 00, SCHEDULE FOR FINISHES.
- C. Concealed Grid Suspension System: Mineral base acoustical tile support.
 1. Concealed grid upward access suspension system initial opening, 300 mm by 600 mm (12 by 24 inches).
 2. Flange Width: 22 mm (7/8 inch) minimum except:
 - a. Access Hook and Angle: 11 mm (7/16 inch) minimum.
- D. Suspension System Support of Metal Type V, VI, and VII Tiles: Concealed grid type with runners for snap-in attachment of metal tile (pans).
- E. Carrying Channels Secondary Framing: Cold-rolled or hot-rolled steel, black asphaltic paint finish, rust free.
 1. Weight per 300 m (per thousand linear feet), minimum:

Size		Cold-rolled		Hot-rolled	
mm	inches	kg	pound	kg	pound
38	1-1/2	215.4	475	508	1120
50	2	267.6	590	571.5	1260

- F. Anchors and Inserts: Provide anchors or inserts to support twice the loads imposed by hangers.
1. Hanger Inserts: Steel, zinc-coated (galvanized after fabrication).
 - a. Nailing type option for wood forms:
 - 1) Upper portion designed for anchorage in concrete and positioning lower portion below surface of concrete approximately 25 mm (one inch).
 - 2) Lower portion provided with minimum 8 mm (5/16 inch) hole to permit attachment of hangers.
 - b. Flush ceiling insert type:
 - 1) Designed to provide a shell covered opening over a wire loop to permit attachment of hangers and keep concrete out of insert recess.
 - 2) Insert opening inside shell approximately 16 mm (5/8 inch) wide by 9 mm (3/8 inch) high over top of wire.
 - 3) Wire 5 mm (3/16 inch) diameter with length to provide positive hooked anchorage in concrete.
- G. Clips: Galvanized steel, designed to secure framing member in place.
- H. Tile Splines: ASTM C635.
- I. Wire: ASTM A641.
1. Size:
 - a. Wire Hangers: Minimum diameter 2.68 mm (0.1055 inch).
 - b. Bracing Wires: Minimum diameter 3.43 mm (0.1350 inch).

2.6 ACCESSORIES

- A. Adhesives: Low pollutant-emitting, water based type recommended by adhered product manufacturer for each application.

SPEC WRITER NOTE: Perimeter Seals are required in clean rooms and where sound insulation is required between different spaces

- B. Perimeter Seal: Vinyl, polyethylene or polyurethane open cell sponge material, density of 1.3 plus or minus 10 percent, compression set less than 10 percent with pressure sensitive adhesive coating on one side.

1. Thickness: As required to fill voids between back of wall molding and finish wall.
 2. Size: Minimum 9 mm (3/8 inch) wide strip.
- C. Access Identification Markers: Colored markers with pressure sensitive adhesive on one side, paper or plastic, 6 to 9 mm (1/4 to 3/8 inch) diameter.
1. Color Code: Provide the following color markers for service identification:

Color	Service
Red	Sprinkler System: Valves and Controls
Green	Domestic Water: Valves and Controls
Yellow	Chilled Water and Heating Water
Orange	Ductwork: Fire Dampers
Blue	Ductwork: Dampers and Controls
Black	Gas: Laboratory, Medical, Air and Vacuum

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine and verify substrate suitability for product installation.
- B. Protect existing construction and completed work from damage.
- C. Remove existing // acoustical panels // suspension system // to permit new installation.
 1. Retain existing // acoustical panels // suspension system // for reuse.
 2. Dispose of // other // removed materials.

3.2 INSTALLATION - GENERAL

- A. Install products according to manufacturer's instructions // and approved submittal drawings //.
 1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.

3.3 ACOUSTICAL UNIT INSTALLATION

- A. Applications:
 1. Cut acoustic units for perimeter borders and penetrations to fit tight against penetration for joint not concealed by molding.

- B. Layout acoustical unit // symmetrically, // with minimum number of joints.
- C. Installation:
 - 1. Install acoustic tiles after wet finishes have been installed and solvents have cured.
 - 2. Install lay-in acoustic panels in exposed grid with minimum 6 mm (1/4 inch) bearing at edges on supports.
 - a. Install tile to lay level and in full contact with exposed grid.
 - b. Replace cracked, broken, stained, dirty, or tile.
 - 3. Tile in concealed grid upward access suspension system:
 - a. Install acoustical tile with joints close, straight and true to line, and with exposed surfaces level and flush at joints.
 - b. Make corners and arises full, and without worn or broken places.
 - c. Locate acoustical units providing access to service systems.
 - 4. Adhesive applied tile:
 - a. Condition of surface according to ASTM D1779, Note 1, Cleanliness of Surface, and Note 4, Rigidity of Base Surface.
 - b. Size or seal surface as recommended by manufacturer of adhesive and allow to dry before installing units.
 - 5. Markers:
 - a. Install color coded markers to identify the various concealed piping, mechanical, and plumbing systems.
 - b. Attach colored markers to exposed grid on opposite sides of the units providing access.
 - c. Attach marker on exposed ceiling surface of upward access acoustical unit.
- D. Touch up damaged factory finishes.
 - 1. Repair painted surfaces with touch up primer.

SPEC WRITER NOTE: Include existing ceiling when required.

3.4 CEILING SUSPENSION SYSTEM INSTALLATION

- A. General: Install according to ASTM C636.
 - 1. Use direct or indirect hung suspension system or combination of both.
 - 2. Support a maximum area of 1.48 sq. m (16 sq. ft.) of ceiling per hanger.

3. Prevent deflection in excess of $1/360$ of span of cross runner and main runner.
 4. Provide additional hangers located at each corner of support components.
 5. Provide minimum 100 mm (4 inch) clearance from the exposed face of the acoustical units to the underside of ducts, pipe, conduit, secondary suspension channels, concrete beams or joists; and steel beam or bar joist unless furred system is shown.
 6. Provide main runners minimum 1200 mm (48 inches) in length.
 7. Install hanger wires vertically. Angled wires are not acceptable except for seismic restraint bracing wires.
- B. Direct Hung Suspension System: ASTM C635.
1. Support main runners by hanger wires attached directly to the structure overhead.
 2. Maximum spacing of hangers, 1200 mm (4 feet) on centers unless interference occurs by mechanical systems. Use indirect hung suspension system where not possible to maintain hanger spacing.
- C. Anchorage to Structure:
1. Concrete:
 - a. Install hanger inserts and wire loops required for support of hanger // and bracing // wire. Install hanger wires with looped ends through steel deck when steel deck does not have attachment device.
 - b. Use eye pins or threaded studs with screw-on eyes in existing or already placed concrete structures to support hanger // and bracing // wire. Install in sides of concrete beams or joists at mid height.
 2. Steel:
 - a. Install carrying channels for attachment of hanger wires.
 - 1) Size and space carrying channels to support load within performance limit.
 - 2) Attach hangers to steel carrying channels, spaced four feet on center, unless area supported or deflection exceeds the amount specified.
 - b. Attach carrying channels to the bottom flange of steel beams spaced not 1200 mm (4 feet) on center before fireproofing is installed. Weld or use steel clips for beam attachment.

- c. Attach hangers to bottom chord of bar joists or to carrying channels installed between the bar joists when hanger spacing prevents anchorage to joist. Rest carrying channels on top of the bottom chord of the bar joists, and securely wire tie or clip to joist.

D. Indirect Hung Suspension System: ASTM C635.

- 1. Space carrying channels for indirect hung suspension system maximum 1200 mm (4 feet) on center. Space hangers for carrying channels maximum 2400 mm (8 feet) on center or for carrying channels less than 1200 mm (4 feet) on center so as to insure that specified requirements are not exceeded.
- 2. Support main runners by specially designed clips attached to carrying channels.

SPEC WRITER NOTE: Ceiling Bracing System is to be used only in structure located in seismic zones. Check drawings for details and verify with Architectural and Structural Engineer. See ASTM E580 for details required.

E. Seismic Ceiling Bracing System:

- 1. Install according to ASTM E580.
- 2. Connect bracing wires to structure above as specified for anchorage to structure and to main runner // or carrying channels // of suspended ceiling at bottom.

3.5 CEILING TREATMENT

A. Moldings:

- 1. Install metal wall molding at perimeter of room, column, or edge at vertical surfaces.
- 2. Install special shaped molding at changes in ceiling heights and at other breaks in ceiling construction to support acoustical units and to conceal their edges.

B. Perimeter Seal:

- 1. Install perimeter seal between vertical leg of wall molding and finish wall, partition, and other vertical surfaces.
- 2. Install perimeter seal to finish flush with exposed faces of horizontal legs of wall molding.

C. Existing ceiling:

- 1. Where extension of existing ceilings occurs, match existing.

2. Where acoustical units are salvaged and reinstalled or joined, use salvaged units within a space. Do not mix new and salvaged units within a space which results in contrast between old and new acoustic units.
3. Comply with specifications for new acoustical units for new units required to match appearance of existing units.

D. Fire-Rated System:

SPEC WRITE NOTE:

1. Fire-rated ceilings are generally required under bar-joists and other lightweight structural steel framing and under thin concrete rib-slab construction. Check regarding requirements for hourly fire rating of ceiling system including protection for mechanical and electrical fixtures.
2. Do not use fire rated systems in new construction. Use only in existing structures to obtain floor ceiling or roof ceiling fire rating when structural members cannot receive sprayed on fire proofing.

1. Total assembly, consisting of the ceiling suspension system, acoustical units, penetrations, structural components and floor or roof construction above, shall have a // 1 hour // 2 hour // 3 hour // fire rating based on tests conducted in conformance with ASTM E119.
2. Provide concealed fire protection around penetrations in ceilings for electric and mechanical work, and other penetrations as required to maintain the integrity of the fire-rated assembly.
3. Install fire rated ceiling systems to conform to tested assembly.

3.6 CLEANING

- A. Remove excess adhesive before adhesive sets.
- B. Clean exposed surfaces. Remove contaminants and stains.

- - - E N D - - -