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SECTION 095756 – LEAK BARRIER CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes products and execution for the installation of Leak Barrier Ceiling Systems within **[an existing [and] [or] [a] new suspension ceiling system [specified in section 09xxxx]** in order to provide selective coverage of critical equipment or areas from an overhead leak. Installation of the Leak Barrier Ceiling shall be into the following ceilings:
1. Existing Suspension System Ceilings:
 - a. 15/16" intermediate duty suspended t-grid ceiling system with 2x4 panels.
 - b. Heavy Duty Data Center Ceiling with 2x4 panels (2'-1/2" x 4'-1/2" actual grid spacing)
 - c. **[Describe the existing ceiling suspension system].**
 2. New Suspension System Ceilings:
 - a. 15/16" intermediate duty suspended t-grid ceiling system with 2x4 panels.
 - b. Heavy Duty Data Center Ceiling with 2x4 panels (2'-1/2" x 4'-1/2" actual grid spacing)
 - c. **[Describe the new ceiling suspension system].**

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include preparation requirements and installation instructions.
- B. Reflected Ceiling Plan - Shop Drawing: For each area of leak protection provide a layout of the leak trays in relation to the grid and the protected equipment or area.
- C. Samples: 6" square (minimum) sample of the plastic sheet material used to form the drainage trays, flat panels and t-grid boots to show actual color and in the case of the interior exposed product, surface texture.

1.3 QUALITY ASSURANCE

- A. Mock-ups: For each type of ceiling grid system provide an inverted floor level mock-up of at least two drainage trays and a flat panel tray (if used) along with interconnecting bulkhead fittings and drainage tubing (with clamps). Set the mock-up leak barrier ceiling products into an inverted mock-up of the existing or new t-grid to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects of the entire system.

1.4 REFERENCE STANDARDS

- A. The current edition of the following reference standards apply to the materials and installation of the Leak Barrier Ceiling System.
 - 1. American Society for Testing and Materials (ASTM)
 - a. C635 - Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - b. C636 - Standard Recommended Practice for Installation of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - c. E 84 - Test Method for Surface Burning Characteristics of Building Materials.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store the ceiling panels in a dry, interior location and keep in cartons prior to installation to avoid damage.
- B. Exercise care in moving and opening cartons to prevent damage to the panel face or flanges.
- C. Inspect materials upon delivery and notify manufacturer immediately if damaged in shipping.

1.6 WARRANTY

- A. Leak Barrier Ceiling System: Submit a written warranty executed by the manufacturer, agreeing to repair or replace components that fail within the warranty period.
- B. Warranty Period:
 - a. Leak Barrier Ceiling System Components: One (1) years from date of purchase.
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide product by AquaTray LLC unless otherwise indicated.

2.2 DRAINAGE TRAY

- A. Description: Main element of the Leak Barrier Ceiling System - 2x4 panel about 4" deep with perimeter drainage troughs and drainage sumps located in the trough at the (4) faces of the panel.

- B. Material: Fire Rated Thermoformable PVC – ASTM E84 Class 1A. (Fire <25 / Smoke <450)
- C. Color: Polar White.
- D. Texture: Haircell H1 one side.

2.3 FLAT PANEL

- A. Description: Optional element of the Leak Barrier Ceiling System - 2x4 flat panel about 0.090” thick used for aesthetically similar panels to be placed outside the area of coverage or as an access panel.
- B. Material: Fire Rated Thermoformable PVC – ASTM E84 Class 1A. (Fire <25 / Smoke <450)
- C. Color: Polar White.
- D. Texture: Haircell H1 one side.

2.4 RAISED FLAT COMPOSITE PANEL

- A. Description: Optional element of the Leak Barrier Ceiling System - 2x4 generic flat panel about 1/8” thick (top panel) with textured Flat Panel 0.090” thick (bottom panel) and an intermediate foam spacer field cut and glued used for cut panels or panels containing ceiling elements to be placed within the area of coverage. Note: Raised flat panel develops minimal weight if flooded.
 - 1. Generic Flat Panel
 - a. Material – Fire Rated Thermoformable PVC – ASTM E84 Class 1A. (Fire <25 / Smoke <450)
 - b. Color: White.
 - c. Texture: smooth both sides
 - 2. Flat Panel
 - a. Material – Fire Rated Thermoformable PVC – ASTM E84 Class 1A. (Fire <25 / Smoke <450)
 - b. Color: Polar White.
 - c. Texture: Haircell H1 one side
 - 3. Foam Spacer
 - a. Material – Expanded Polystyrene Foam, 3/4" thick.
 - 4. Spray Glue
 - a. Material – 3M Polystyrene Foam #78 Spray Adhesive - high strength, industrial grade spray adhesive that is typically used for bonding most types of insulation specifically expanded polystyrene foam, and extruded polystyrene foam.

2.5 BULKHEAD FITTING – STANDARD DRAIN

- A. Description: Three piece white injection molded assembly with (1) exterior fitting (male threaded) one interior fitting (female threaded nut) and an intermediate rubberized gasket. When installed into the sump location of a drainage tray it provides the means to drain the tray and to connect the drainage path from tray to tray.

- B. Size: 3/4" FNPT with smooth outer diameter 1.25"
- C. Material: PVC and Synthetic Rubber
- D. Color: Off White.

2.6 BULKHEAD FITTING – EMERGENCY DRAIN

- A. Description: Three piece injection molded assembly with (1) exterior fitting (male threaded) one interior fitting (female threaded nut) and an intermediate rubberized gasket. When installed into the raised flay panel (at the top generic panel) it provides the means to drain the entire ceiling if the main drainage path becomes blocked
- B. Size: 3" MNPT threaded below and female socket above
- C. Material: CPVC and Synthetic Rubber - McMaster Carr model number 36895K836-3" or approved equal.
- D. Color: Grey.

2.7 DRAINAGE TUBING

- A. Description: Single piece clear extruded tube to connect drainage trays below the ceiling plane. Clear color provides a visual indication of the presence of any leak fluid.
- B. Material: Clear flexible PVC tubing 1.25" ID x 1.50" OD x 8.5" long (standard Intermediate duty ceiling grid) or x 9.0" long (for Heavy duty Data Center ceiling grid). ID to match OD (with interference fit) of bulkhead fitting.
- C. Color: Clear.

2.8 TUBING CLAMPS

- A. Description: Single piece formed polymer clamp with toothed engagement feature to secure drainage tubing to exterior of bulkhead fitting.
- B. Material: Lightweight, corrosion resistant hose clamp manufactured from high performance, thermoplastic polyacetal (POM) material. A quick, ratchet closure provides for reduced assembly time and allows for application after connection of the hose. Release is achieved by initiating opposed lateral movement of the ratchet ends. Size to match OD of drainage tubing.
- C. Color: White.

2.9 T-GRID BOOTS

- A. Description: Single piece thermoformed polymer boot to be cut to the proper configuration (cross, tee or corner) then placed over the t-grid intersections for a standard intermediate duty grid in order to ease the installation of flashing tape at the corners.

- B. Material: Fire Rated Thermo-formable PVC – ASTM E84 Class 1A. (Fire <25 / Smoke <450)
- C. Color: Polar White.
- D. Texture: Smooth both sides or Haircell H1 on the underside and smooth on the top...

2.10 FLASHING TAPE

- A. Manufacturer: 3M or approved equivalent.
- B. Description: 6” wide or 4” wide waterproof flashing tape to apply up and over the t-grid then affixed to the top surface of the drainage tray or flat panel to provide a leak tight installation.
- C. Material: 3M™ All Weather Flashing Tape #8067. Self-adhered, waterproof flashing membrane for sealing around openings and penetrations. Acrylic pressure sensitive adhesive that aggressively sticks and stays adhered. The proprietary backing seals around driven nails and staples to prevent moisture intrusion. The split paper release liner provides fast application with easy and accurate positioning of the tape.
- D. Color: Clear with brand labeling and dimensional markings.

2.11 MISCELLANEOUS MATERIALS

- A. Wall Angle
 - 1. Description: Used to make 6” long corner brackets for the integral support of the corners of each drainage tray panel along with supports for the adjacent t-grid.
 - 2. Wall angle cut to a length of 6” long with specification as indicated in Suspension System [09xxxx] [below].
- B. Pop Rivets
 - 1. Description: Used to attach the wall angle corner brackets to the upturned flange of the drainage tray panel.
 - 2. 1/8” x 1/2” long standard pop rivet used for commercial ceiling installations.
- C. Hangar Wire
 - 1. Description: Used for the corner supports of each drainage tray panel
 - 2. See suspension system section [09xxxx] [below].

2.12 SUSPENSION SYSTEMS

- A. T-Grid Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized steel as per ASTM A653. Main beams and cross tees are double-web steel construction with (15/16 inch – minimum) type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.

1. Structural Classification: ASTM C635 Intermediate or Heavy Duty.
 2. Color: White or match the actual color of the selected panel, unless noted otherwise.
- B. Attachment Devices: Size for five times design load indicated in ASTM C635, Table 1, Direct Hung unless otherwise indicated.
- C. Hanger Wire and Ties: ASTM A641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least three times design load, but not less than 12 gauge.
- D. Wall Angle: Metal of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations. Provide moldings with exposed flange of the same width as exposed runner.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine project conditions, with Installed present, for compliance with shop drawing layout the existing grid system (is present) and other conditions affecting performance of the Work.
1. UV Light Exposure: Do not install where the top side of the leak barrier ceiling is exposed to direct sunlight. This may affect the long term integrity of the flashing tape. If this condition exists (i.e. presence of skylights) provide UV light masking to the light emitting surface.
- B. Verify suitability of the building support structure, including surface conditions and compatibility with the provisions of additional hanger supports for the ceiling system.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
1. Start of installation constitutes Contractor's acceptance of building support structure and UV lighting conditions.

3.2 PREPARATION AND COORDINATION

- A. Installing Contractor shall become trained in and comply with manufacturer's written instructions and recommendations in the document entitled "Installation Instructions".
- B. Coordinate fully with other Trade Contractors for the installation or relocation of ceiling elements (sprinklers, room lights, exit lights, speakers, smoke detectors etc.) out of the area of coverage for the Leak Barrier Ceiling System. For installation of these elements within the area of coverage coordinate with the other Trade Contractors so that they install suitable products which are leak sealed from above and provide a suitable surface to apply flashing tape.
- C. Coordinate fully with other Trade Contractors (Plumbing Contractor and Leak Detection System Contractor) for the installation of the final drain piping and the leak detection system (if provided) as needed for the integrated installation of the Leak Barrier Ceiling System.

3.3 INSTALLATION

- A. All work must be in strict accordance with the manufacturer's written instructions. Make adjustments or enhancements as needed to suit field conditions.
- B. Layout grid and drainage tray arrangement in accordance with approved shop drawings.
- C. Install suspension system and panels in compliance with ASTM C636, with the authorities having jurisdiction, and in accordance with the manufacturer's installation instructions or in the case of new suspension system in accordance with the separate Project specification section [09xxxx].
- D. **FOR INSTALLATION IN STANDARD INTERMEDIATE DUTY CEILINGS**
 - 1. Provide supports at the (4) corners of each drainage tray for added support to that of the grid alone. Cut wall angle into 6" brackets (4) per drainage tray section. Pop rivet in place to the upturned flange of the drainage tray in the (4) corners with at least (2) pop rivets placed symmetrically about the bracket centerline and at least 4 inches apart.
 - 2. Pre-drill the openings for bulkhead fittings into the appropriate locations of each drainage tray then pre-install the bulkhead fittings. Place the gasket on the outside surface of the panel so it does not come in contact with the nut. Tighten nut snugly.
 - 3. Progressively place the drainage trays into the ceiling and apply t-grid boots over the top of grid intersections and cut to the proper configuration (cross, tee or corner) then apply flashing tape from panel to panel up and over the t-grid and then wire hangers. Temporary supports for the t-grid may be needed to properly install the flashing tape.
 - 4. **NOTICE:** Special attention is needed when applying the flashing tape to insure a leak barrier. Make sure that tape is not stretched before or during application and that it is firmly affixed to the substrate with no wrinkles. Apply added tape at the corners and at wire hangers and for any penetrations or ceiling elements.
- E. **FOR INSTALLATION IN HEAVY DUTY DATA CENTER CEILINGS**
 - 1. Confirm that the ceiling has a published rating in excess of 25 pounds per square foot (PSF) and that the ceiling is installed in accordance with grid manufacturer's recommendations. In this case individual supports at the (4) corners are not needed.
 - 2. Pre-drill the openings for bulkhead fittings into the appropriate locations of each drainage tray then pre-install the bulkhead fittings. Place the gasket on the outside surface of the panel so it does not come in contact with the nut. Tighten nut snugly.
 - 3. Install hold down clips provided by the grid manufacturer at the (4) sides of the drainage panel. Place at the center of each of the (4) sides.
 - 4. Progressively place the drainage trays into the ceiling then apply flashing tape from panel to panel up and over the t-grid.
 - 5. **NOTICE:** Special attention is needed when applying the flashing tape to insure a leak barrier. Make sure that tape is not stretched before or during application and that it is firmly affixed to the substrate with no wrinkles. Apply added tape at the corners and at hanger rods and for any penetrations or ceiling elements.
- F. In areas where cut panels or penetrations for pipes, wires, conduit or other ceiling elements are needed use a Raised Flat Composite Panel in lieu of the 2x4 drainage tray. If the cut panel is not "land locked" or completely surrounded by drainage trays then install bulkhead fittings vertically through the flat panel, drill through the top panel for connection of piping or tubing to the bottom side (outlet) of the fitting. Raised Flat Composite Panels shall be used only after layout changes are considered to eliminate cut panels or to consolidate ceiling elements as they

limit the drainage capacity of the system. No supports or hold down clips needed as the raised panel develops minimal weight if flooded. Apply the flashing tape to form a pipe boot or dam at cable conduit or pipe penetrations. NOTICE: Special attention is needed when applying the flashing tape to insure a leak barrier. Make sure that tape is not stretched before or during application and that it is firmly affixed to the substrate with no wrinkles. Apply added tape at the corners and at hangers and for any penetrations or ceiling elements.

- G. For installations where the entire room is provided with a leak barrier ceiling system install 3” emergency drain bulkhead fittings through a Raised Flat Composite Panel. Place the gasket above the top panel so it does not come in contact with the nut. Tighten nut snugly. Quantity and location as indicated on the coordination drawings with a minimum of (2) for the ceiling.
- H. When ceiling installation is complete install drainage tubing between trays at the bulkhead locations with the installation of tubing clamps.
- I. Where indicated coordinate prior to installation and leave bulkhead fittings for the installation of the final drainage pipe. Coordinate with the Plumbing Contractor for proper drain line installation.
- J. Where indicated coordinate prior to installation and leave access for the installation of a leak detection system sensors and wires. Coordinate with the Leak Detection Contractor for proper leak detection system installation.

3.4 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from ceiling installation operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.

END OF SECTION 095756