

Master Format™, MASTERSPEC, CSI, CSC Specification Recommendations for Constructing and Sealing Access Floor Plenums for Under Floor Air Delivery UFAD

The consequences of Air Leakage in Under Floor Air Delivery (UFAD) applications are significant and constructing an airtight plenum for air delivery requires strict coordination of many sub trades. In consideration Camino has prepared the following guide for subcontractor specifications related to constructing and sealing an Access Floor Plenum.

Access Floor Plenum Air Leakage Basics

Category 1: General Construction Leakage – from plenum into other building cavities – air is wasted or short circuited into return air – leakage occurs to the outside of the intended occupied zone through the slab, wall penetrations, under walls etc.

Category 2: Product Leakage - plenum supply air that leaks into the occupied zone through spaces other than the designed air distribution devices - access panel seams, electrical boxes, edge conditions, etc.

General: All walls passing through the access floor must have gypsum board extending completely to the slab and be sealed at the slab line. All penetrations into cavity walls and slabs for air ducts, plumbing pipes, electrical conduit and voice/data cabling must be completely sealed. All seams and/or holes that have been created for or resulting from the work performed by a specific trade must be properly sealed by that trade and whenever possible performed prior to the installation of the access floor.

Quality Assurance: Special inspections must be conducted by an independent quality auditor or commissioning agent to ensure that plenum sealing work is performed by all subcontractors in compliance with specifications and drawings. Inspections shall occur as work progresses and whenever possible in the presence of a representative from the general contractor. Reports of inspections are to be submitted to the general contractor.

Mock-Up & Testing: All subcontractors responsible for constructing or penetrating the underfloor plenum must participate in the construction of an on-site plenum mockup consisting of all planned plenum components, penetrations, seams and openings. The mock-up plenum is to be inspected and tested by an independent commissioning agent for air leakage to verify that it was constructed and sealed in accordance with specifications and drawings including meeting the air leakage requirements.

Building Plenum Inspections and Tests: The constructed plenum is to be inspected and tested by an independent commissioning agent for air leakage to verify that it was constructed and sealed in accordance with specifications and drawings including meeting the air leakage requirements.

UFAD Plenum Air Leakage Requirements: Total air leakage from the plenum to be no more than 15% of the design airflow for category 1 leakage, and 15% of the design airflow for category 2 leakage.

Successful Application of Under Floor Air Delivery via Access Floor Plenum

The successful application of UFAD requires an integrated approach between Architects, Engineers, Construction managers and Trades such as: Concrete, Masonry, Drywall, Millwork, Sealant and joint specialists, Carpenters, Sheet metal, Plumbing, Communications, Etc.

The following specification paragraph applies to **ALL** Construction activities specified in Master Format™, CSI, CSC and similar organized construction specifications that impact the integrity of the access floor plenum space used for Under Floor Air Delivery:

The _____ contractor is aware that the space beneath the access floor will be used as an air delivery plenum and as such will take the necessary precautions when installing their work so as not to impact the integrity of the plenum space specific to air leakage and cleanliness. Any penetrations or holes in the underfloor plenum resulting from the work performed by the division __ contractors are required to be properly sealed to prevent air leakage and any debris created in the sealing process is to be thoroughly cleaned and removed.

DIVISION 01 - GENERAL REQUIREMENT SPECIFICATIONS

Pre-Bid & Pre-Construction Meetings: All sub-contractors intending to bid on or awarded work that impacts the integrity of the UFAD access floor project are required to attend pre-bid and pre-construction meetings respectively. The purpose of these meetings is to review all air plenum specifications and details including but not limited to pre-construction mock-ups and plenum sealing requirements.

DIVISION 02 - EXISTING CONDITIONS SPECIFICATION

DIVISION 03 - CONCRETE SPECIFICATION – CAST IN PLACE CONCRETE

DIVISION 04 - MASONRY SPECIFICATION

DIVISION 05 - METALS - STAIRS SPECIFICATION

DIVISION 06 - WOOD, PLASTIC, COMPOSITES SPECIFICATION

DIVISION 07 - THERMAL AND MOISTURE PROTECTION SPECIFICATION

DIVISION 08 - OPENINGS SPECIFICATION

DIVISION 09 - FINISHES (WALLS) SPECIFICATION

DIVISION 09 - FINISHES (ACCESS FLOORING) SPECIFICATION

DIVISION 09 - FINISHES (TILE CARPETING) SPECIFICATION

DIVISION 10 - SPECIALTIES SPECIFICATION

DIVISION 11 - EQUIPMENT SPECIFICATION

DIVISION 12 - FURNISHINGS SPECIFICATION

DIVISION 13 - SPECIAL CONSTRUCTION SPECIFICATION

DIVISION 14 - CONVEYING EQUIPMENT SPECIFICATION

DIVISION 21 - FIRE SUPPRESSION

DIVISION 22 - PLUMBING SPECIFICATION

DIVISION 23 - HEATING VENTILATION AND AIR CONDITIONING SPECIFICATION

DIVISION 25 - INTEGRATED AUTOMATION SPECIFICATION

DIVISION 26 - ELECTRICAL SPECIFICATION

DIVISION 27 - COMMUNICATIONS SPECIFICATION

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

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The following section to be added as applicable to Access Floor specifications for Under Floor Air Delivery (UFAD) projects:

3.2 Air Plenum Sealing

3.2.1 Access Floor System

Access floor system contractor shall sufficiently seal the access floor system as required at following locations to maintain air tightness:

- A. Access floor perimeter at wall junctions.
- B. Columns and fire-rated wall assemblies.
- C. Fascia edge constructions.
- D. Access Floor to curb connections.
- E. Penetrations for utilities cut into access floor panels by access floor contractor shall be sufficiently sealed by access floor contractor.
- F. All cable and wire openings shall be sealed with manufacture's standard removable cable cutout or grommets.
- G. Air leakage into user space from access floor without accessories shall not exceed 0.15 CFM per sq. ft. at 0.05 in. wg. once carpet and base are glued in place.

3.2.2 General Contractor

General Contractor/Construction Manager shall ensure subtrade responsibility for meeting following air tightness requirements:

- A. Before start of access floor system installation, all slab to slab walls in areas to receive access floors shall be sufficiently sealed at the junction of walls and slabs.
- B. All ductwork, conduit, cabling and piping penetrations through walls, plenum dividers, and slabs shall be sufficiently sealed.
- C. All utility penetrations cut into access floor cavity by other trades during and after completion of installation of access floor system shall be sufficiently sealed by trade responsible for cutting the penetration.
- D. Sequence construction and schedule trades to ensure:
 - i. Curtain wall is complete and building is sealed against weather and temperature issues before commencement of access floor installation.
 - ii. Environmental conditions for installation are maintained at 55° to 85°F and 20% to 70% per access floor product specification during installation to ensure expansion and contraction issues of the floor system are kept to a minimum.