Architect’s Guide for Detailing & Specifying Access Floor Air Plenums
Access floor air plenum integrity begins with proper design and specification.
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Plenum Integrity is one of the most important aspects of designing, constructing and maintaining an underfloor air delivery (UFAD) system. It is vital that the entire design and construction team does their part to ensure the underfloor plenum is sealed properly. This process starts with the architect. As the architect designing a building with a UFAD system you have the responsibility of providing specifications and details for constructing a plenum with proper sealing and integrity. Every contractor working in the plenum space needs to be aware of their responsibilities and should be equipped with the information they need to successfully complete their work while maintaining plenum integrity.

Tate Access Floors is providing the following plenum seal integrity guidelines for consideration. The recommendations contained within this guideline are based on lessons learned through working on a wide range of UFAD projects. To that end, Tate believes a holistic approach to design and construction should be used and recommends regular consultation be held with key individuals on the construction team throughout the entire design process.

There are six primary recommendations. An overview and explanation of each recommendations is provided below followed by proposed specification language and construction details.

**Design:** Specifications and performance requirements that create awareness and responsibility for plenum sealing integrity should be included in all divisions of the CSI specifications. Drawings detailing the construction requirements for the underfloor air delivery plenum should also be provided.

**Pre-Bid Meeting:** The requirement for pre-bid meetings to inform all subcontractors of the plenum sealing and mock-up construction requirements should be specified.

**Pre-Construction:** Pre-construction meetings should also be specified to reaffirm the plenum sealing requirements to each sub-contractor division.

**Mock-up:** Specify the construction and testing of a mock-up that includes all actual building conditions relative to the UFAD system.

**Quality Inspections:** Specify the use of a commissioning agent to audit the construction process, perform air leakage testing on the mock-up and final installation, and provide detailed reporting to the GC that ensures the construction of the UFAD system follows the specified requirements.

### Downloadable Specifications & Details

Visit Tate’s website to download the sealing details and recommended specification language in this guide. The details are available in AutoCAD dwg and PDF file formats. In addition a Microsoft word version of the specifications in this guide can be found in the architectural details under the Product & Spec section of the website or by entering the following address into a web browser: www.tateaccessfloors.com/products/architectural_details.aspx
CSI Specifications for Consideration

The following is Tate’s recommended access floor air plenum sealing specification language to insert into the CSI specifications for subcontrac-
tors. All of the specifications can be downloaded on-line at www.tateaccessfloors.com/products/architectural_details.aspx

DIVISION 01 - GENERAL REQUIREMENT SPECIFICATIONS

Pre-Bid & Pre-Construction Meetings: All sub-contractors intending to bid on or awarded work on the 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.

Quality Control: 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 should be properly sealed by that trade and whenever possible performed prior to the installation of the access floor.

Quality Control: 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 will be submitted to the general contractor.

Plenum 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.

Air Leakage Requirements: Total air leakage from the plenum should be no more than 10% of the design airflow for category 1 leakage, and 10% of the design airflow for category 2 leakage when tested at the typical static pressure range of .05 -.10” w.g. max.

Note: There are two basic categories of UFAD air leakage. Category 1 leakage occurs outside of the intended occupied zone. Category 2 leakage is plenum air that leaks into the occupied zone through spaces other than the designed air distribution devices such as diffusers. Category 2 leakage is unique to UFAD systems because all of this leakage goes into the occupied space whereas in a traditional ducted overhead system, all leakage and short-circuited air enters the return plenum and will not reach the intended zone.

*The allowable Category 1 leakage number used to commission UFAD systems is higher than overhead distribution. This higher number is used because the entire HVAC system from supply point to diffuser is being tested in a UFAD system. By comparison overhead systems typically only test the trunk or high and medium pressure ducts. The test being performed on a UFAD system would be the equivalent to using the following equation on an overhead system: Leakage = supply duct + VAV box + low pressure duct + flex duct + diffuser & flex connection.

DIVISION 03 - CONCRETE SPECIFICATION - Cast in Place Concrete

The concrete 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 3 contractors not intended for service utility distribution are required to be properly sealed to prevent air leakage.

DIVISION 05 - METAL STAIRS SPECIFICATION

The metal stair 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 created for or resulting from the work performed by the division 5 contractors are required to be properly sealed to prevent air leakage.
DIVISION 09 - FINISHES (WALLS) SPECIFICATION

The wall 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 created for or resulting from the work performed by the wall contractors are required to be properly sealed to prevent air leakage.

DIVISION 09 - FINISHES (ACCESS FLOORING) SPECIFICATION

The access floor 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 created for or resulting from the work performed by the access flooring contractors are required to be properly sealed to prevent air leakage.

DIVISION 09 - FINISHES (TILE CARPETING) SPECIFICATION

The carpeting 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 created for or resulting from the work performed by the carpeting contractors are required to be properly sealed to prevent air leakage.

DIVISION 14 - CONVEYING EQUIPMENT SPECIFICATION

The conveying equipment 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 created for or resulting from the work performed by the division 14 contractors are required to be properly sealed to prevent air leakage.

DIVISION 22 - PLUMBING SPECIFICATION

The plumbing 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 created for or resulting from the work performed by the division 22 plumbing contractors are required to be properly sealed to prevent air leakage.

DIVISION 23 - HEATING VENTILATION AND AIR CONDITIONING SPECIFICATION

The HVAC 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 created for or resulting from the work performed by the division 23 HVAC contractors are required to be properly sealed to prevent air leakage.

DIVISION 26 - ELECTRICAL SPECIFICATION

The electrical 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 created for or resulting from the work performed by the division 26 electrical contractors are required to be properly sealed to prevent air leakage.

DIVISION 27 - COMMUNICATIONS SPECIFICATION

The communications 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 created for or resulting from the work performed by the division 27 communications contractors are required to be properly sealed to prevent air leakage.
Construction Details for Consideration

The following are typical sealing details that should be considered to ensure UFAD plenum integrity. All of the details can be downloaded on-line at:  www.tateaccessfloors.com/products/architectural_details.aspx

Underfloor Air Sealing Locations

PLAN VIEW WITHOUT ACCESS FLOOR

Base Building Core & Shell Sealing Details

A) PERIMETER SEAM ALONG SLAB AND EXTERIOR WALL
B) ENCLOSED COLUMN SEAM AT SLAB LINE

C) DRYWALL PARTITION CONDITION

D) BASE OF STAIRS ON BUILDING SLAB
E) TOP OF STAIR INTERFACE WITH CONCRETE DECK

F) ELEVATOR SHAFT BELOW ACCESS FLOOR LINE

G) EXPANSION JOINT IN CONCRETE DECK
HVAC System Sealing Details

H) OPENING IN SLAB FOR VERTICAL DUCTS

I) OPENING IN PLENUM WALLS FOR DUCTS
Plumbing Sealing Details

J) PIPE PENETRATION THROUGH CONCRETE DECK

K) PIPE PENETRATION THROUGH PLENUM WALLS

Electrical System Sealing Details

I) CONDUIT THROUGH PLENUM WALLS
M) OPEN ENDS OF CONDUIT IN THE PLENUM SPACE

N) CABLE PENETRATIONS THROUGH PLENUM WALL WITH CABLE SLEEVE

Voice/Data System Sealing Details
Access Floor Air Sealing Locations

PLAN VIEW WITH ACCESS FLOOR INSTALLED

Access Floor Sealing Details

1) PLENUM DIVIDERS

- Panel fastened to plenum head with combo cornerlock screw
- Attach plenum channel with stringer screws
- Field applied gasket
- Tape joints with metal foil tape
- 8’ long galvanized steel hat channel
- Fasten with tek screws
- 25 ga, x 8’ steel bottom angle not as required so that it does not extend above hat channel
- Field applied tate plenum gasket pn 10626
- Tape joints with metal foil tape where bottom angle sections meet and where hat channel sections meet
- Bottom angle set in field applied continuous adhesive bead
2) AIR HIGHWAYS

Note: The typical static pressure in an air highway is from 0.05" W.G. to 0.15" W.G.

3) PENETRATIONS THROUGH PLENUM DIVIDERS

MELD APPLIED GASKET AT HAT CHANNEL (TYP)

POSILock PEDESTAL (TYP)

Hat Channel PleNUM Divider

Aluminum foil tape at joints

PleNUM Divider Assembly

Cable sleeve (firestop or putty inside of sleeve)

Seal to fill gap (TYP)

WATER Pipe(s)

Conduit

Metal foil tape at joints

4) PERIMETER SEAM WITHOUT WALL BASE

WALL extends to subfloor

Access floor panel

Seal at FL0 or wall line

Cut panels to within 1/4 of wall

Seal at slab line

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5) PERIMETER SEAM WITH WALL BASE

6) PERIMETER SEAM AT NON-SMOOTH WALLS & COLUMNS

7) ACCESS FLOOR SEAL AT FASCIA / EXPOSED EDGE
8) ACCESS FLOOR SEAL AT FASCIA / EXPOSED EDGE

9) PERIMETER SEAM AT TOP OF STAIR LANDING

10) PERIMETER SEAM AT BASE OF STAIR LANDING
11) PENETRATION IN WALL THROUGH ACCESS FLOOR

12) PERIMETER SEAM AT FIRE BARRIER BELOW DOOR THRESHOLD

13) PERIMETER SEAM AT CURB WHERE FLOOR COVERING IS CONTINUOUS
14) PERIMETER SEAM AT CURB WHERE FLOOR COVERING IS NOT CONTINUOUS

15) CABLE CUTOUTS & GROMMETS

16) POWER, VOICE/DATA DISTRIBUTION BOXES IN ACCESS FLOOR PANELS

17) PIPE PENETRATION THROUGH ACCESS FLOOR