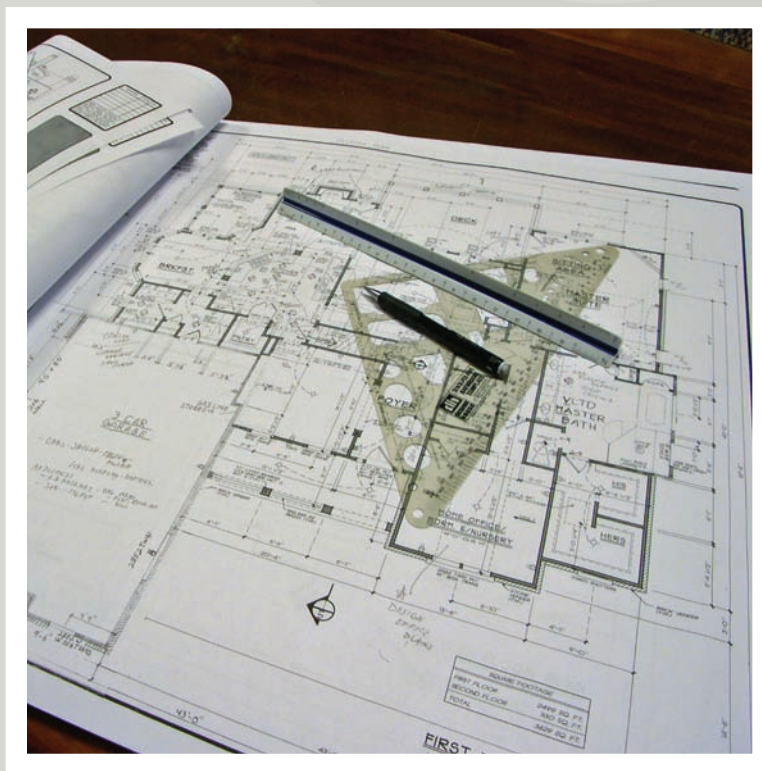


# Architect's Guide for Detailing & Specifying Access Floor Air Plenums



“ Access floor air plenum integrity begins with proper design and specification. ”

# Architect's Guide for Detailing & Specifying Access Floor Air Plenums

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](http://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 subcontractors. All of the specifications can be downloaded on-line at [www.tateaccessfloors.com/products/architectural\\_details.aspx](http://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 26 communications contractors are required to be properly sealed to prevent air leakage.

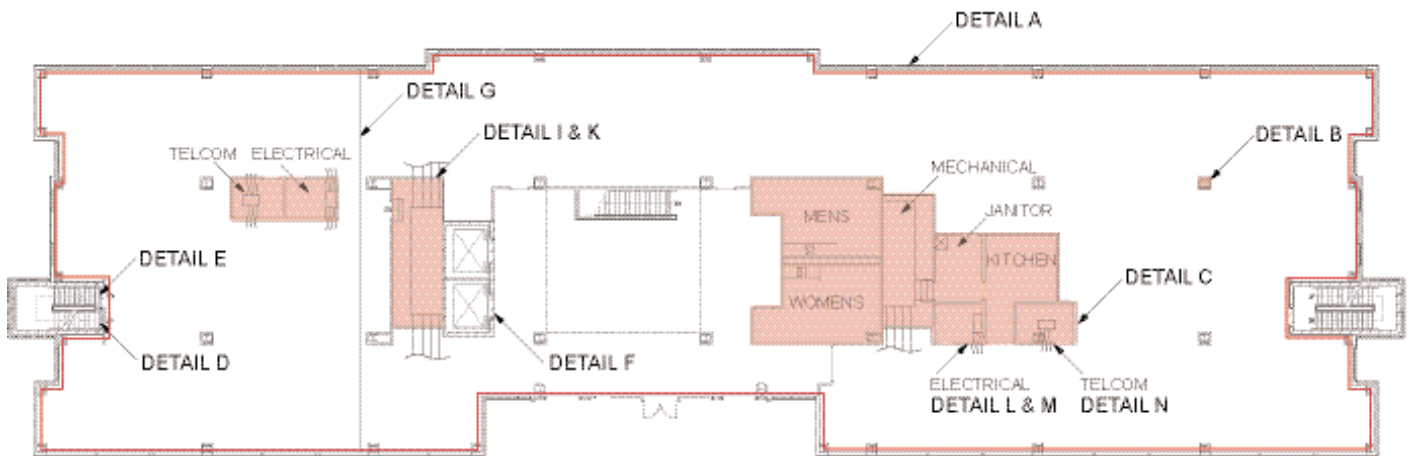
The logo for Tate, featuring the word "Tate" in a bold, blue, sans-serif font with a registered trademark symbol (®) to the upper right.

# 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](http://www.tateaccessfloors.com/products/architectural_details.aspx)

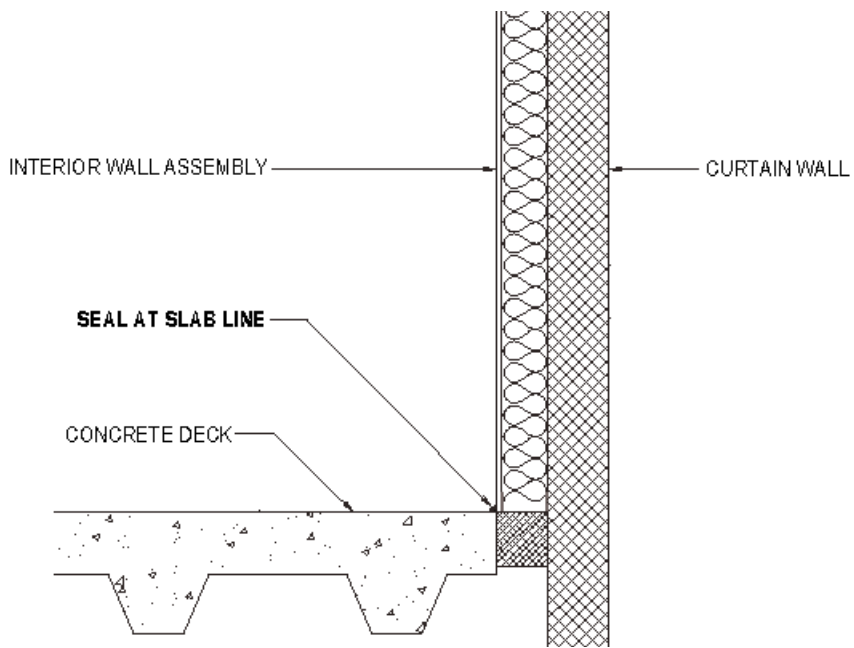
## Underfloor Air Sealing Locations

PLAN VIEW WITHOUT ACCESS FLOOR

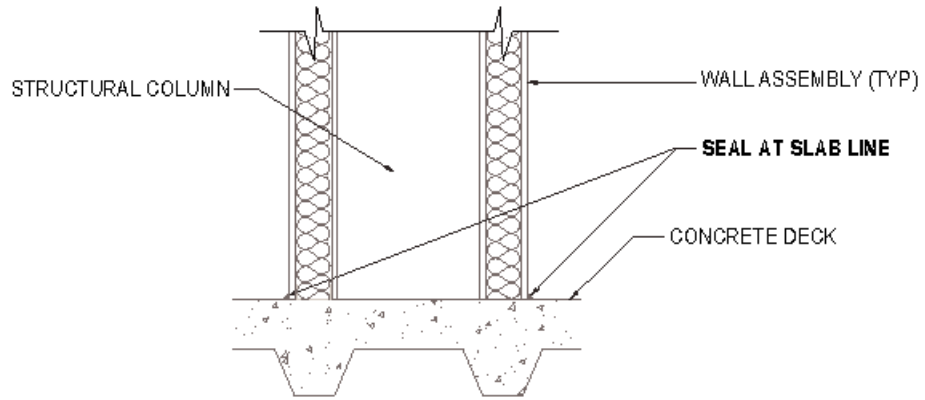


## Base Building Core & Shell Sealing Details

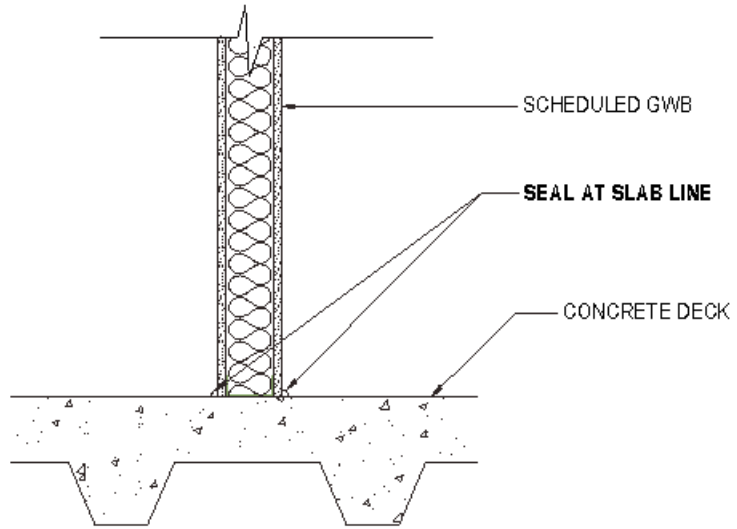
A) PERIMETER SEAM ALONG SLAB AND EXTERIOR WALL



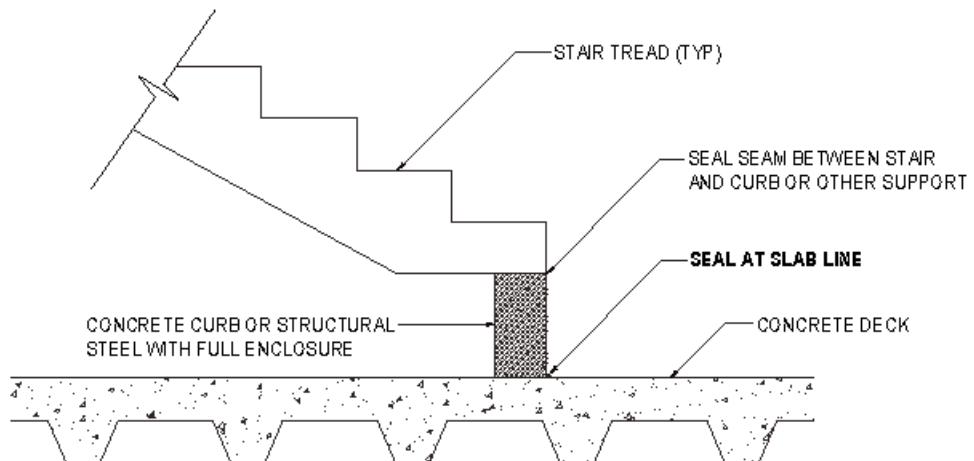
**B) ENCLOSED COLUMN SEAM AT SLAB LINE**



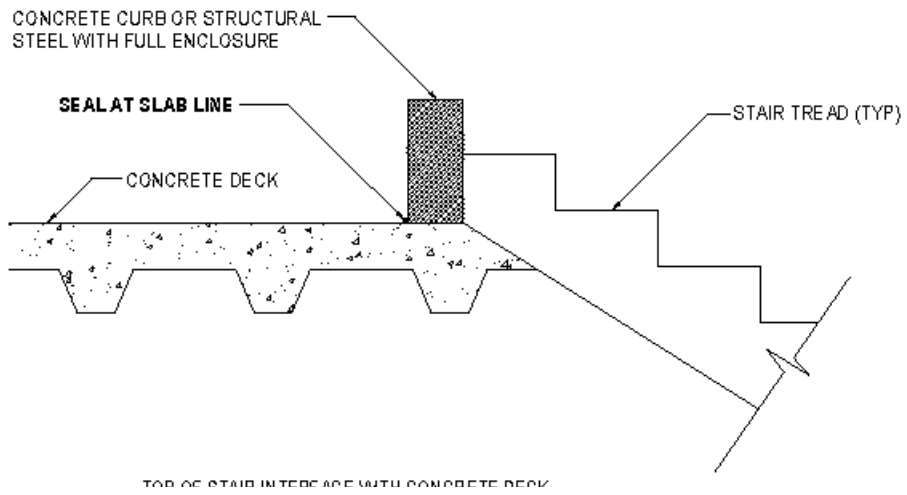
**C) DRYWALL PARTITION CONDITION**



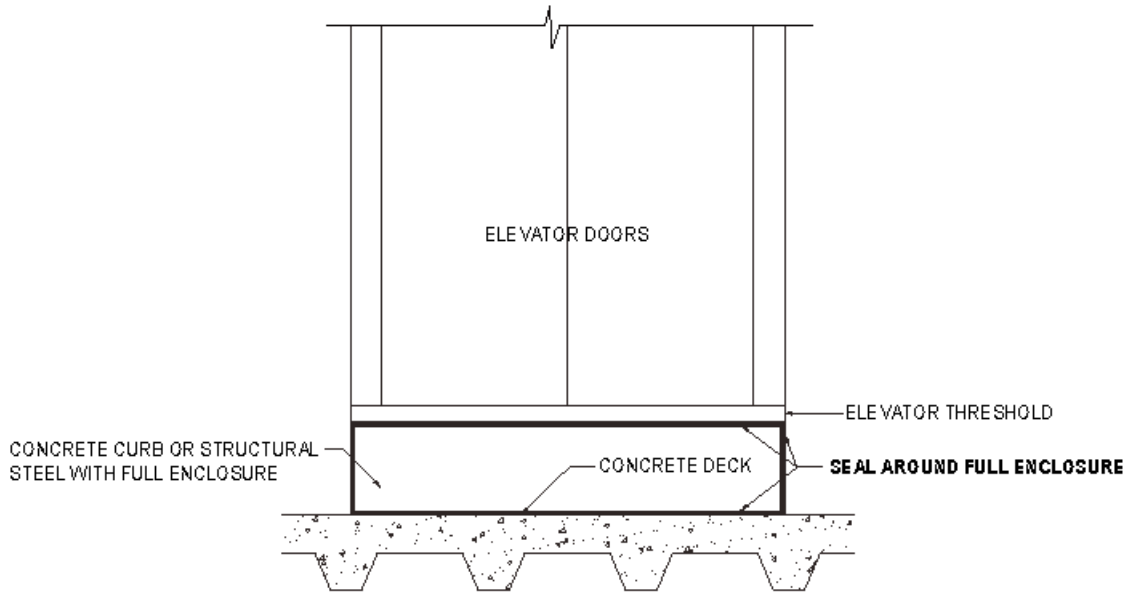
**D) BASE OF STAIRS ON BUILDING SLAB**



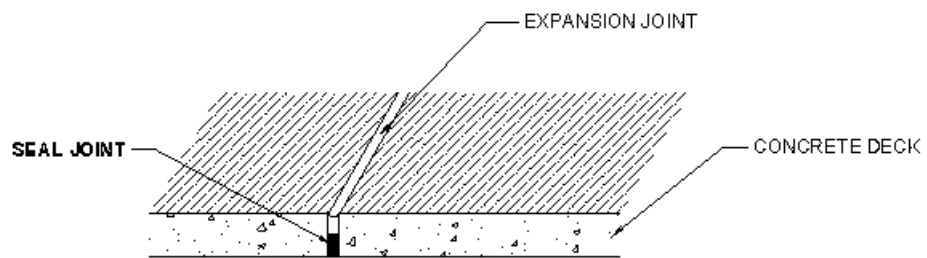
**E) TOP OF STAIR INTERFACE WITH CONCRETE DECK**



**F) ELEVATOR SHAFT BELOW ACCESS FLOOR LINE**

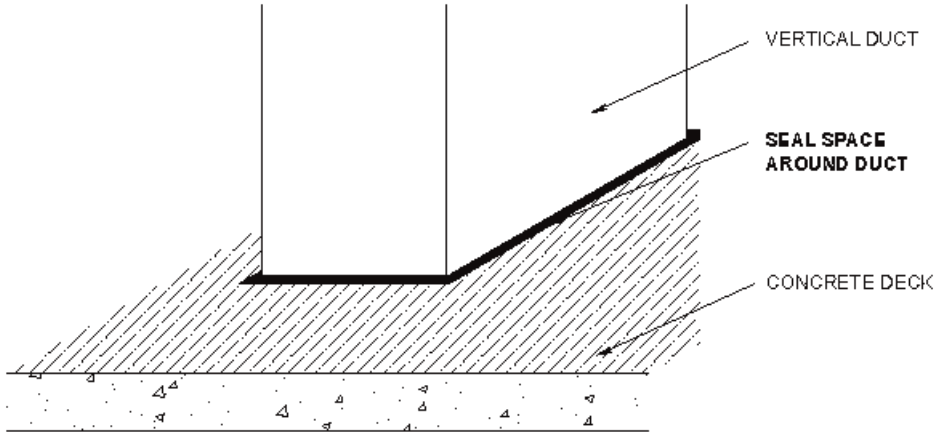


**G) EXPANSION JOINT IN CONCRETE DECK**

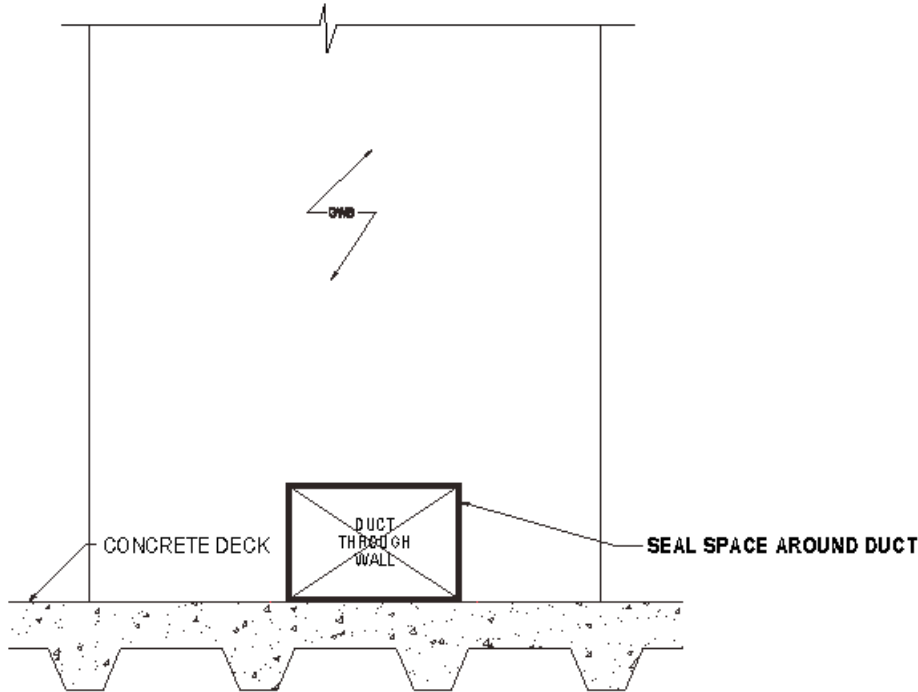


# HVAC System Sealing Details

## H) OPENING IN SLAB FOR VERTICAL DUCTS

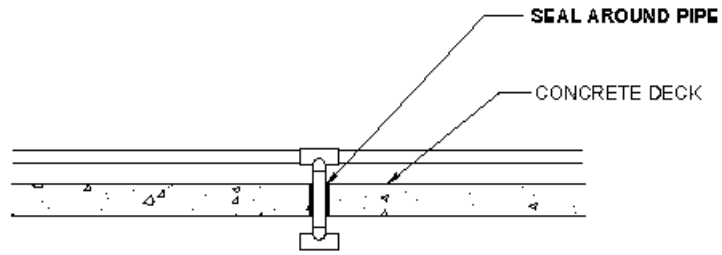


## I) OPENING IN PLENUM WALLS FOR DUCTS

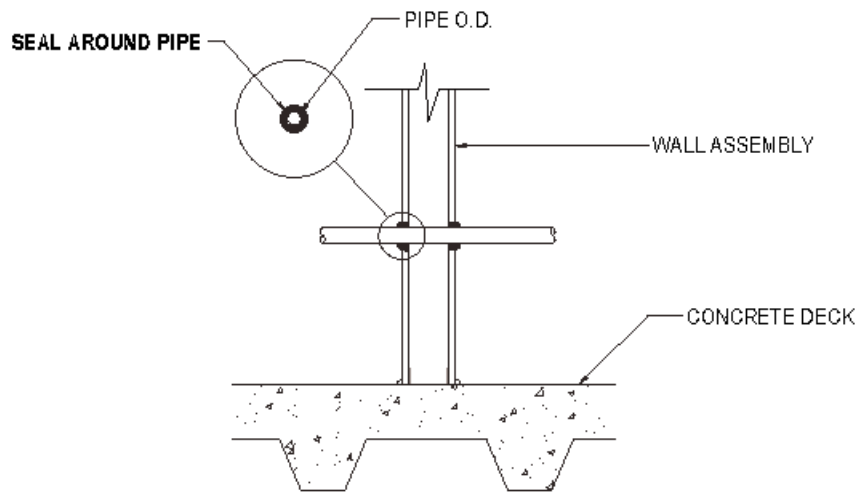


# Plumbing Sealing Details

## J) PIPE PENETRATION THROUGH CONCRETE DECK

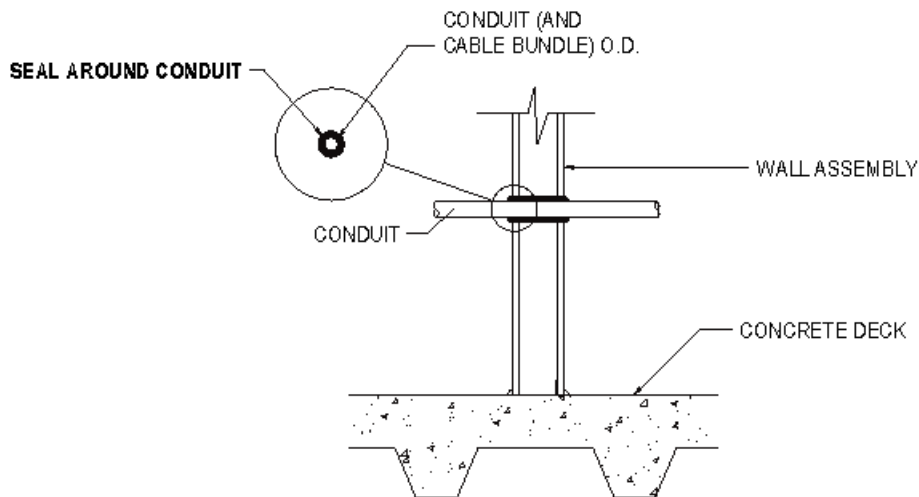


## K) PIPE PENETRATION THROUGH PLENUM WALLS

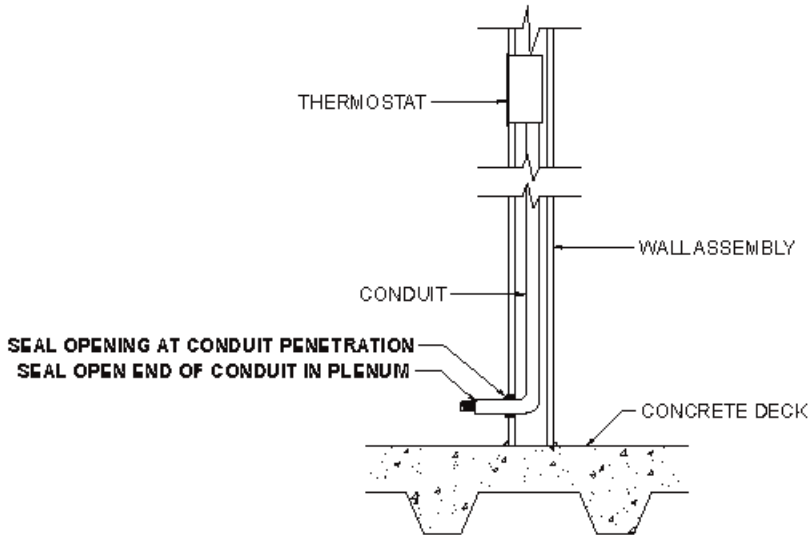
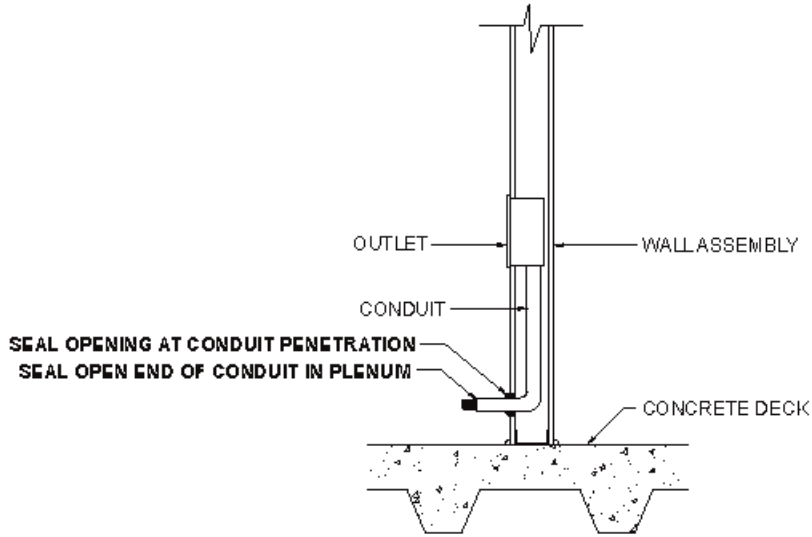


# Electrical System Sealing Details

## I) CONDUIT THROUGH PLENUM WALLS

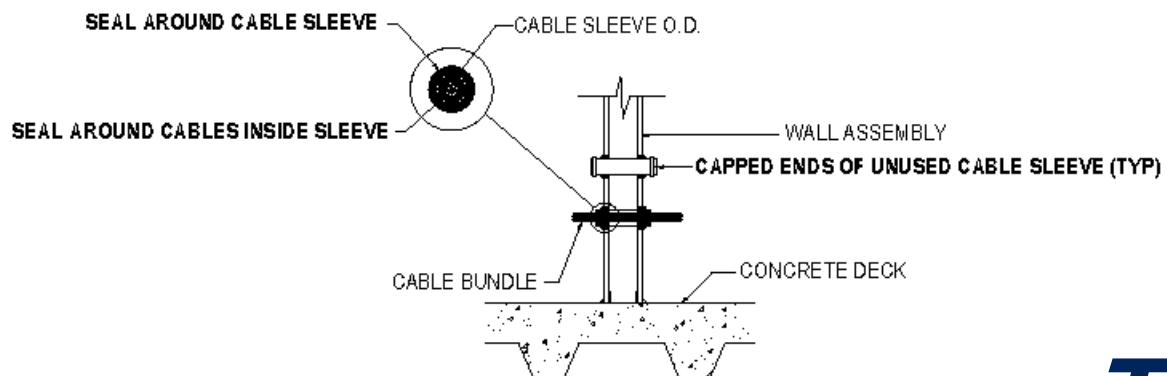


M) OPEN ENDS OF CONDUIT IN THE PLENUM SPACE



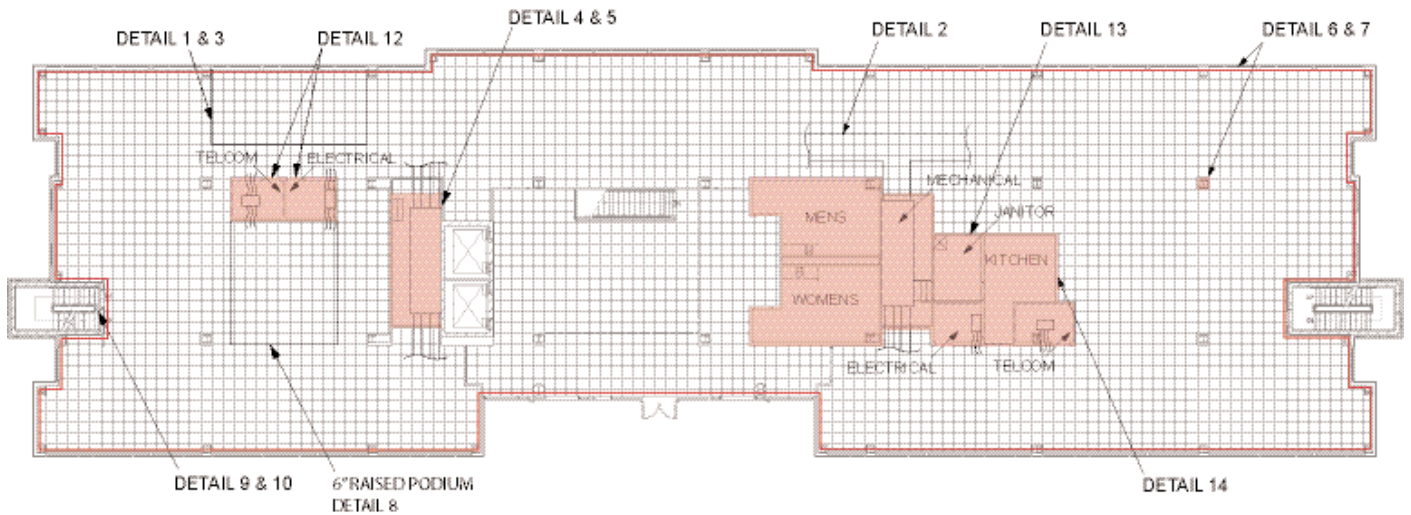
## Voice/Data System Sealing Details

N) CABLE PENETRATIONS THROUGH PLENUM WALL WITH CABLE SLEEVE



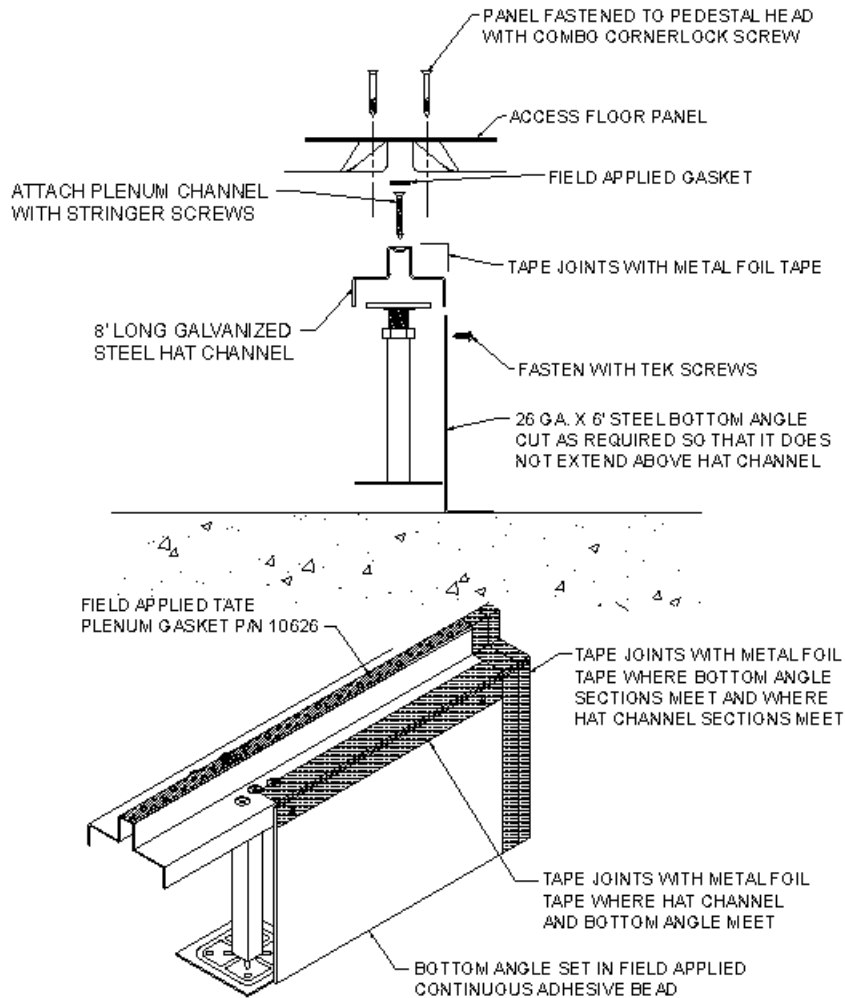
# Access Floor Air Sealing Locations

PLAN VIEW WITH ACCESS FLOOR INSTALLED



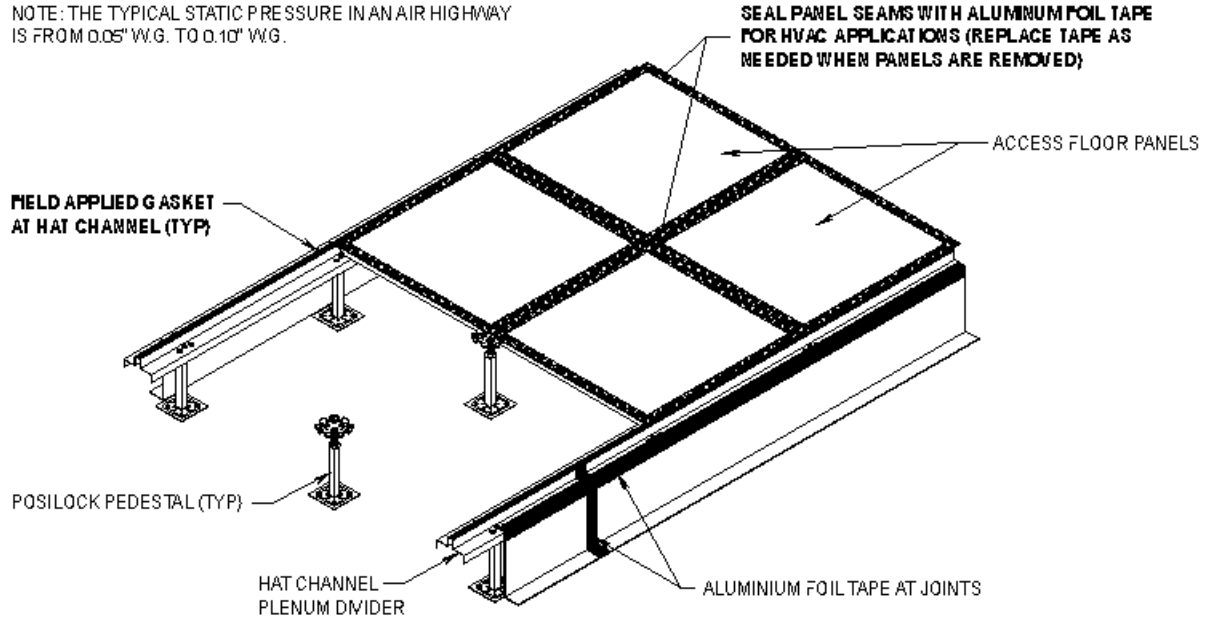
## Access Floor Sealing Details

### 1) PLENUM DIVIDERS

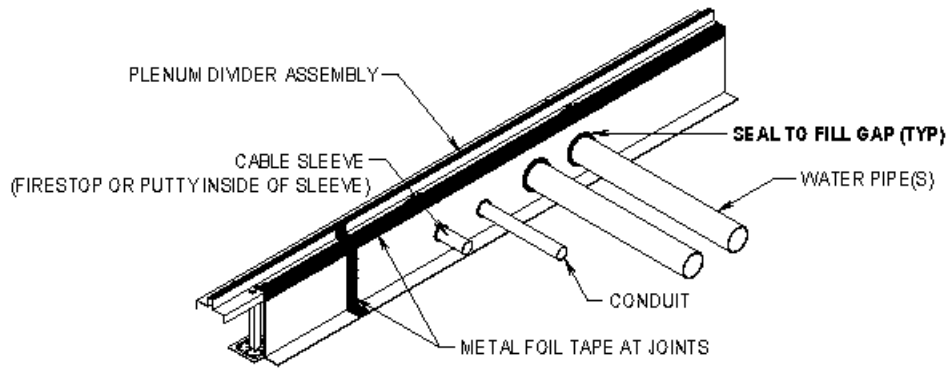


**2) AIR HIGHWAYS**

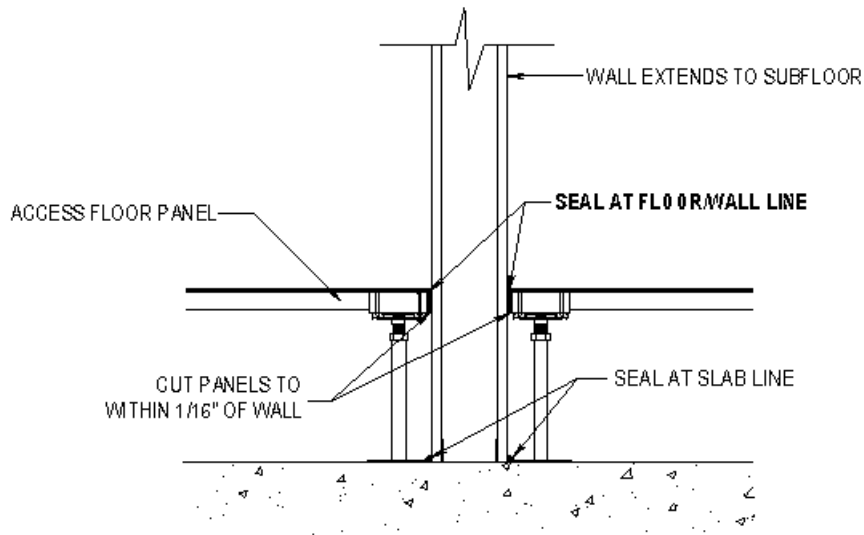
NOTE: THE TYPICAL STATIC PRESSURE IN AN AIR HIGHWAY IS FROM 0.05" W.G. TO 0.10" W.G.



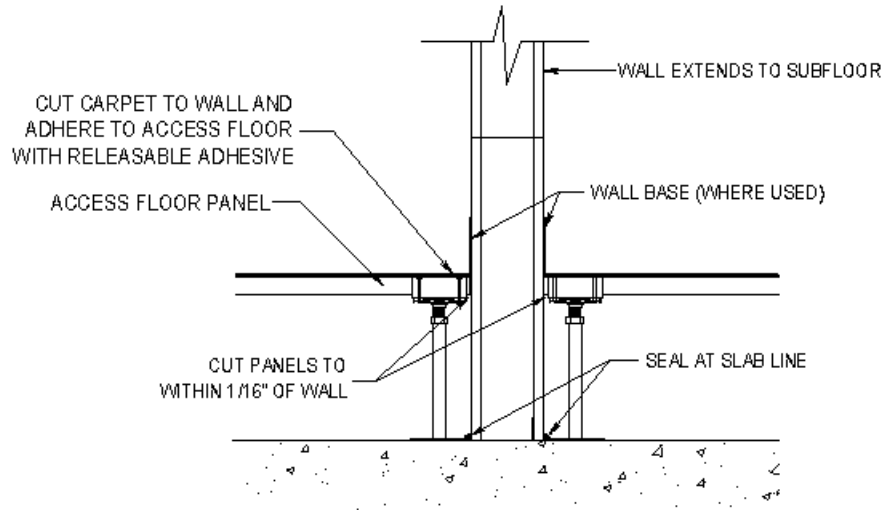
**3) PENETRATIONS THROUGH PLENUM DIVIDERS**



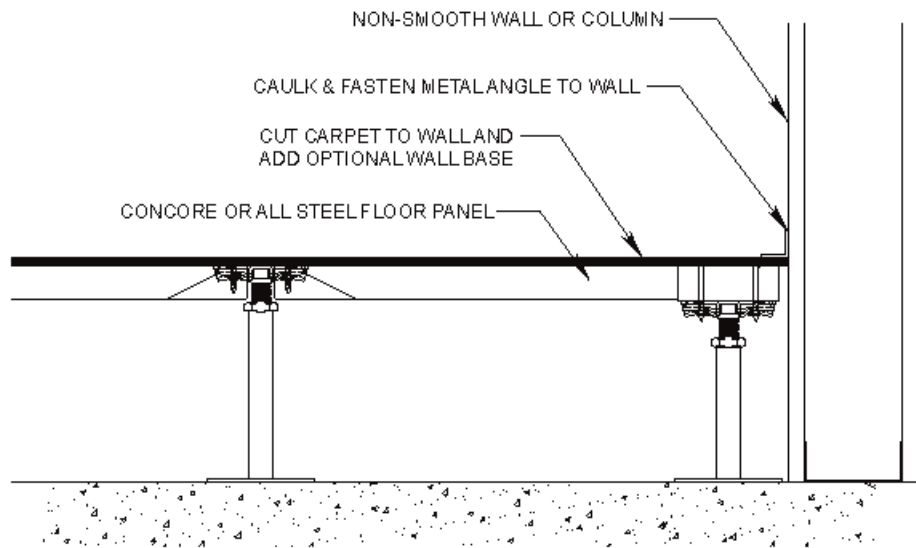
**4) PERIMETER SEAM WITHOUT WALL BASE**



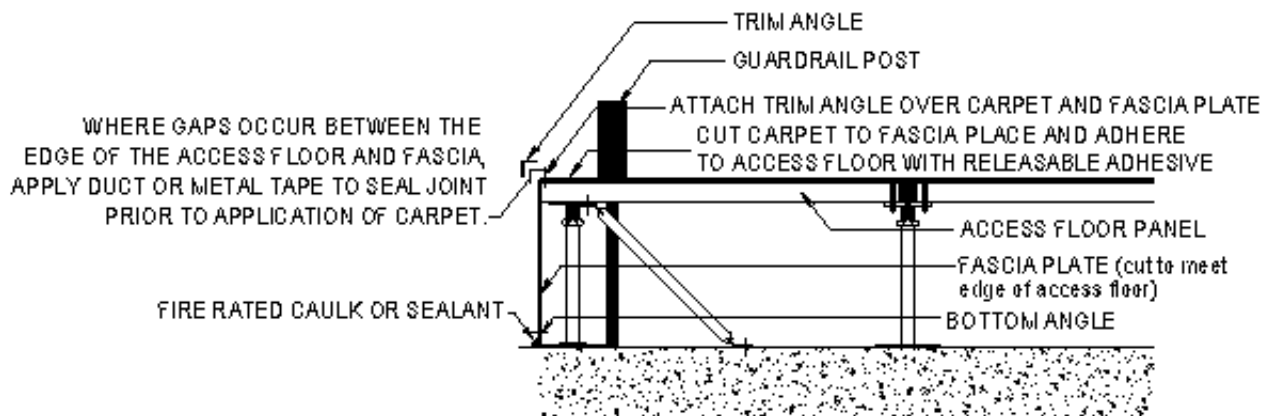
5) PERIMETER SEAM WITH WALL BASE



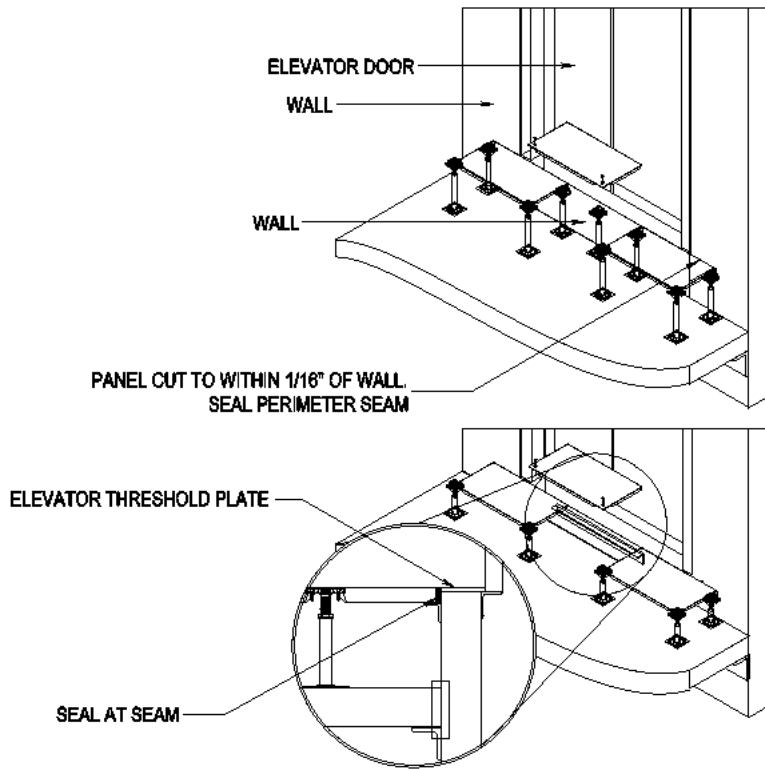
6) PERIMETER SEAM AT NON-SMOOTH WALLS & COLUMNS



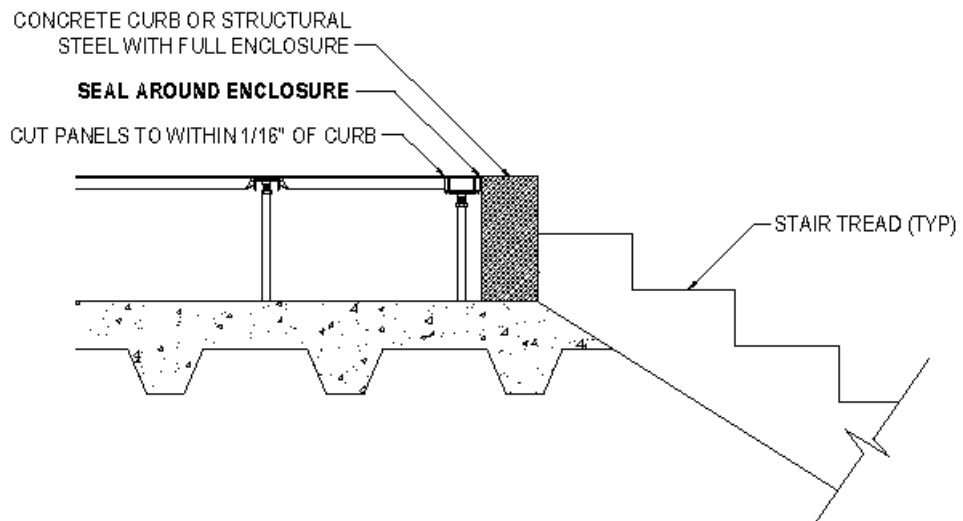
7) ACCESS FLOOR SEAL AT FASCIA / EXPOSED EDGE



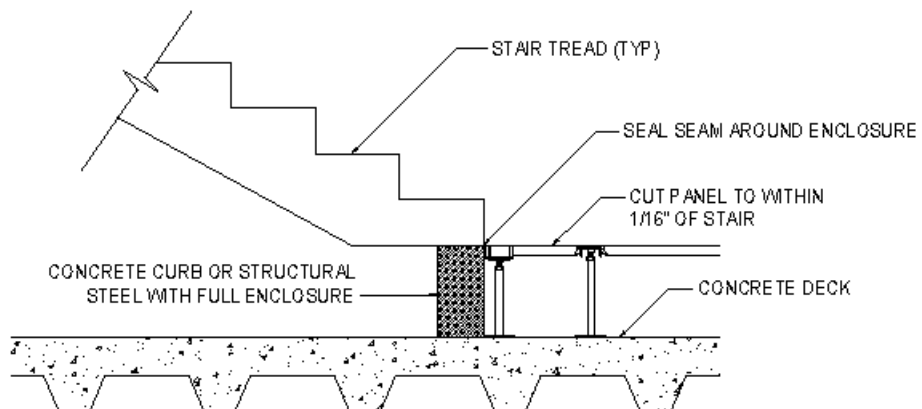
8) ACCESS FLOOR SEAL AT FASCIA / EXPOSED EDGE



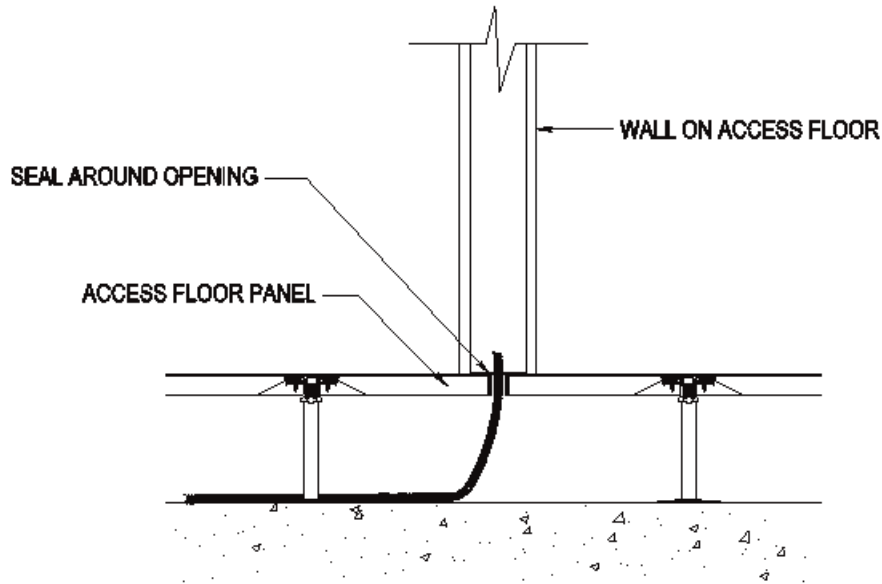
9) PERIMETER SEAM AT TOP OF STAIR LANDING



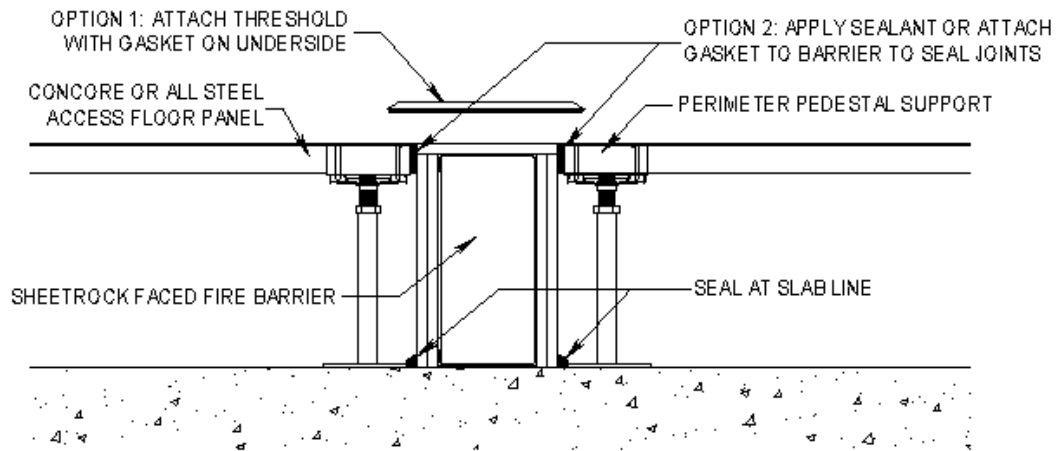
10) PERIMETER SEAM AT BASE OF STAIR LANDING



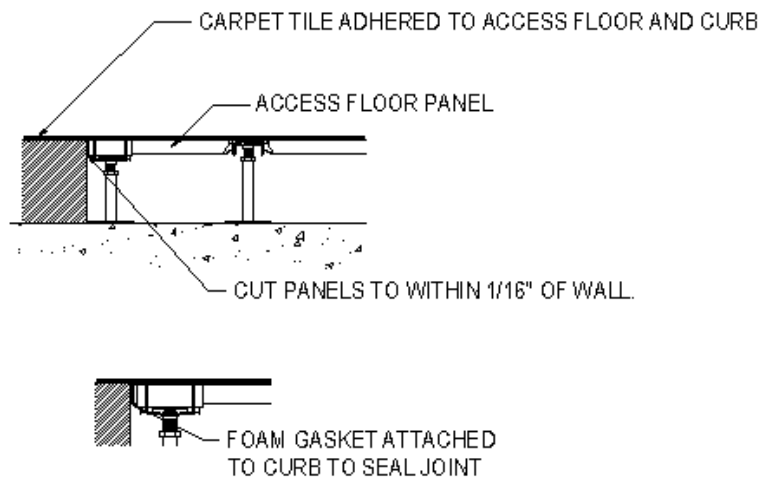
11) PENETRATION IN WALL THROUGH ACCESS FLOOR



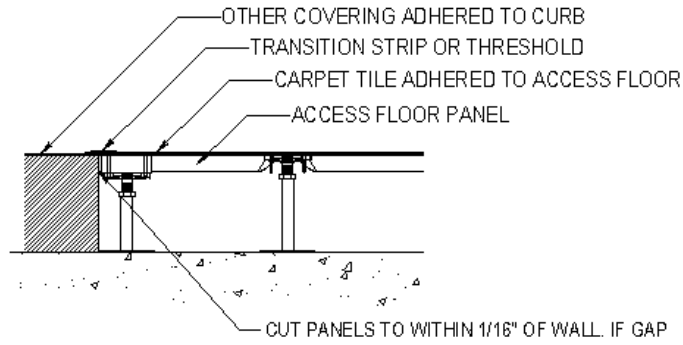
12) PERIMETER SEAM AT FIRE BARRIER BELOW DOOR THRESHOLD



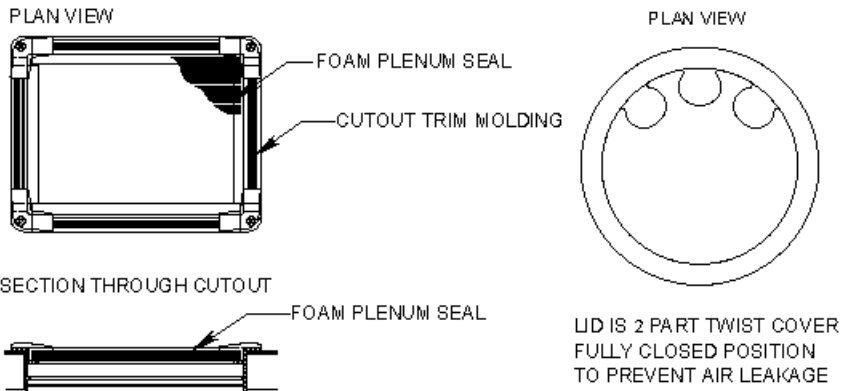
13) PERIMETER SEAM AT CURB WHERE FLOOR COVERING IS CONTINUOUS



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

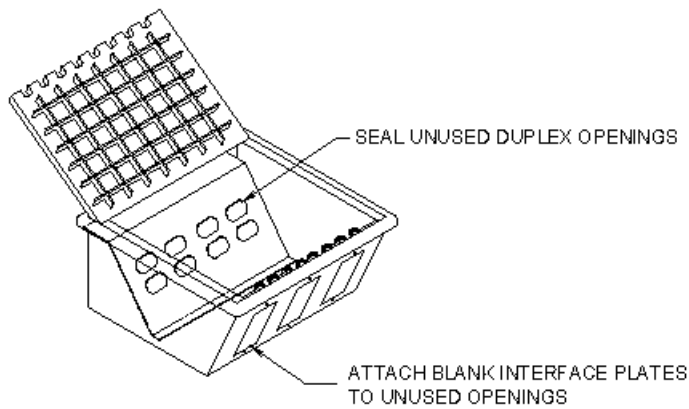


15) CABLE CUTOUTS & GROMMETS

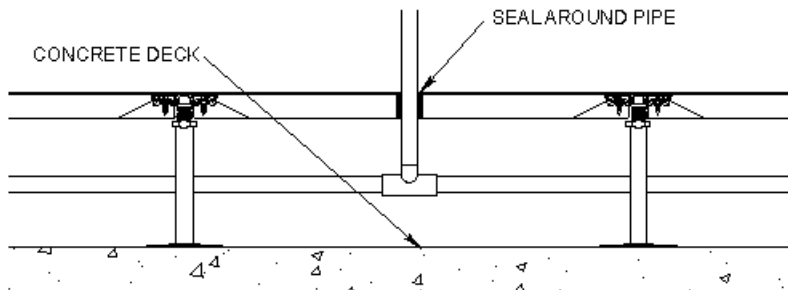


FOAM PLENUM SEALS:  
THESE ARE PROVIDED BY THE  
ACCESS FLOOR MANUFACTURER AND  
ARE RECOMMENDED TO SEAL  
CABLE OPENINGS

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



17) PIPE PENETRATION THROUGH ACCESS FLOOR



# Tate®



## Tate Access Floors, Inc.

### Corporate Headquarters:

7510 Montevideo Road, Jessup, MD 20794  
Tate Hotline: 1-800-231-7788  
Tel: 410-799-4200 Fax: 410-799-4207

### Production Facilities:

7510 Montevideo Road, Jessup, MD 20794  
52 Springvale Road, Red Lion, PA 17356

### International Sales & Support Office:

169 Jalan Jurong Kechil  
#7-011, Sherwood  
Singapore 598669  
Tel: 65-6468-1332 Fax: 65-6468-6681

[tateglobal.com](http://tateglobal.com)  
[kingspan.com](http://kingspan.com)

[tateaccessfloors.com](http://tateaccessfloors.com)  
[kingspan.com](http://kingspan.com)



Tate Access Floors, Inc.  
components are proudly  
made in the U.S.A.



## Tate ASP Access Floors, Inc.

### Canadian Office & Production Facilities:

880 Equestrian Court, Oakville, ON L6L 6L7 Canada  
Tate Hotline: 1-800-231-7788  
Tel: 905+847-0138 Fax: 905+847-0141

[tateasp.com](http://tateasp.com)  
[kingspan.com](http://kingspan.com)

A member of



Tate Building Technology Platform®, ConCore®, GrateAire®, PosiLock®, PosiTile®, PVD Servicer®, Floating Floors®, Integral Trim®, SustainAbility® and AirArrest® are registered trademarks of Tate Access Floors, Inc. DirectAire™, SmartAire™ and PowerAire™ are trademarks of Tate Access Floors, Inc. © 2007 Tate Access Floors, Inc. Revised 2010