



**Arch 1240 Methods of Construction in Architecture**  
**Professor Jason Montgomery**

# Cladding with Metal and Glass

(Chapters 21)





# Aluminum Extrusions

THERMAL BREAKS

FINISH OPTIONS

## Framing Systems

STOREFRONTS

CURTAIN WALLS

## Modes of Assembly

STICK SYSTEMS

UNIT SYSTEMS

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# Modes of Assembly

OUTSIDE GLAZED CURTAIN  
WALL SYSTEM

INSIDE GLAZED CURTAIN  
WALL SYSTEM

Components of a  
Typical Curtain Wall  
Mullion

structure

glazing pocket

thermal break

pressure plate

shear block

glazing gaskets

snap on cover







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Curtain wall  
Frame  
Materials:

Steel  
Bronze  
wood

Aluminum



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Aluminum  
properties:

strong

light weight

conducts heat  
rapidly

some corrosion,  
requires finishing  
to avoid spotting



Aluminum  
Finishes:

anodized

Baked on Finishes  
organic  
enamel

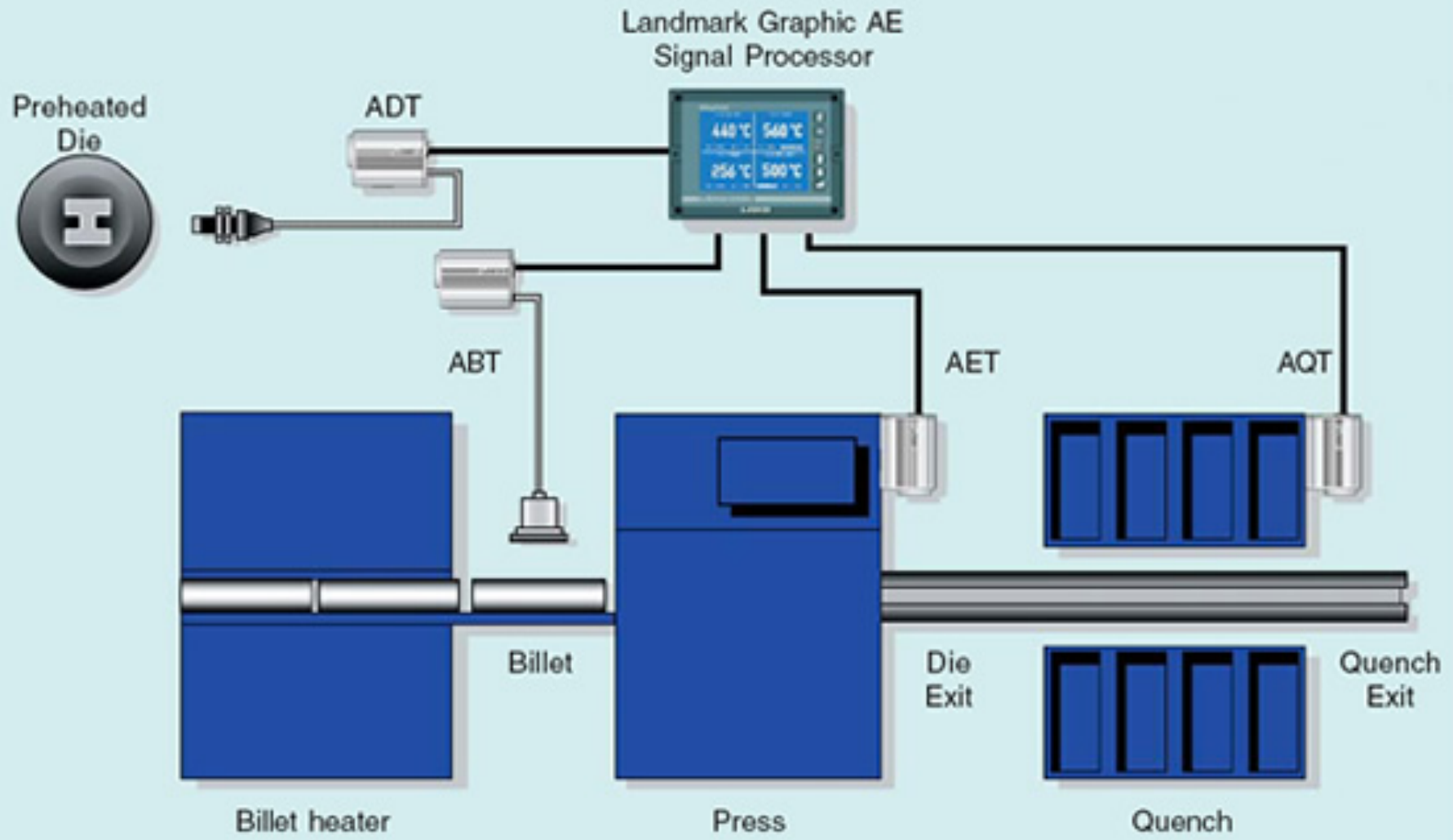
Powder Coats







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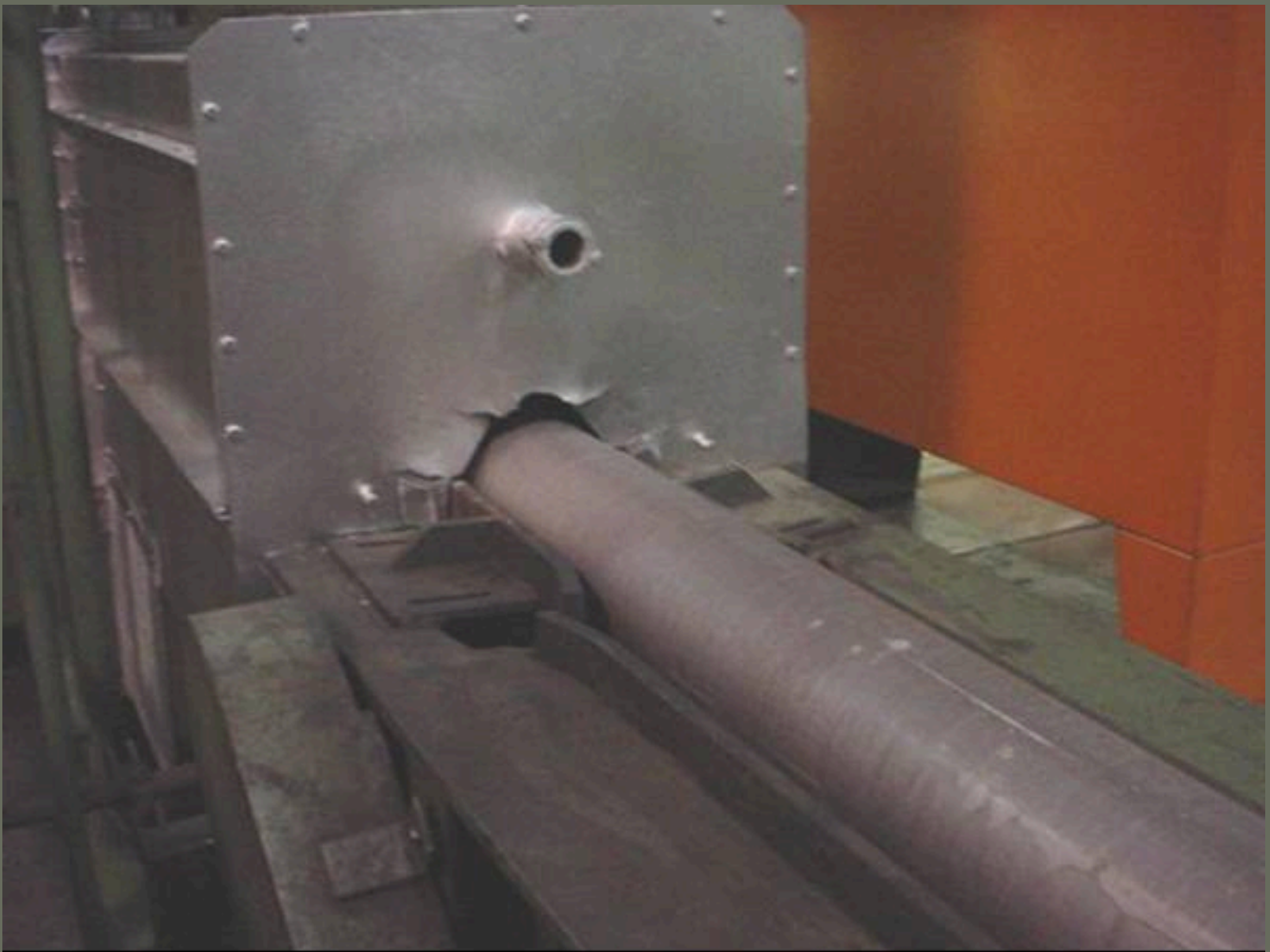
# ALUMINUM EXTRUSION PROCESS





BILLETS OF ALUMINUM

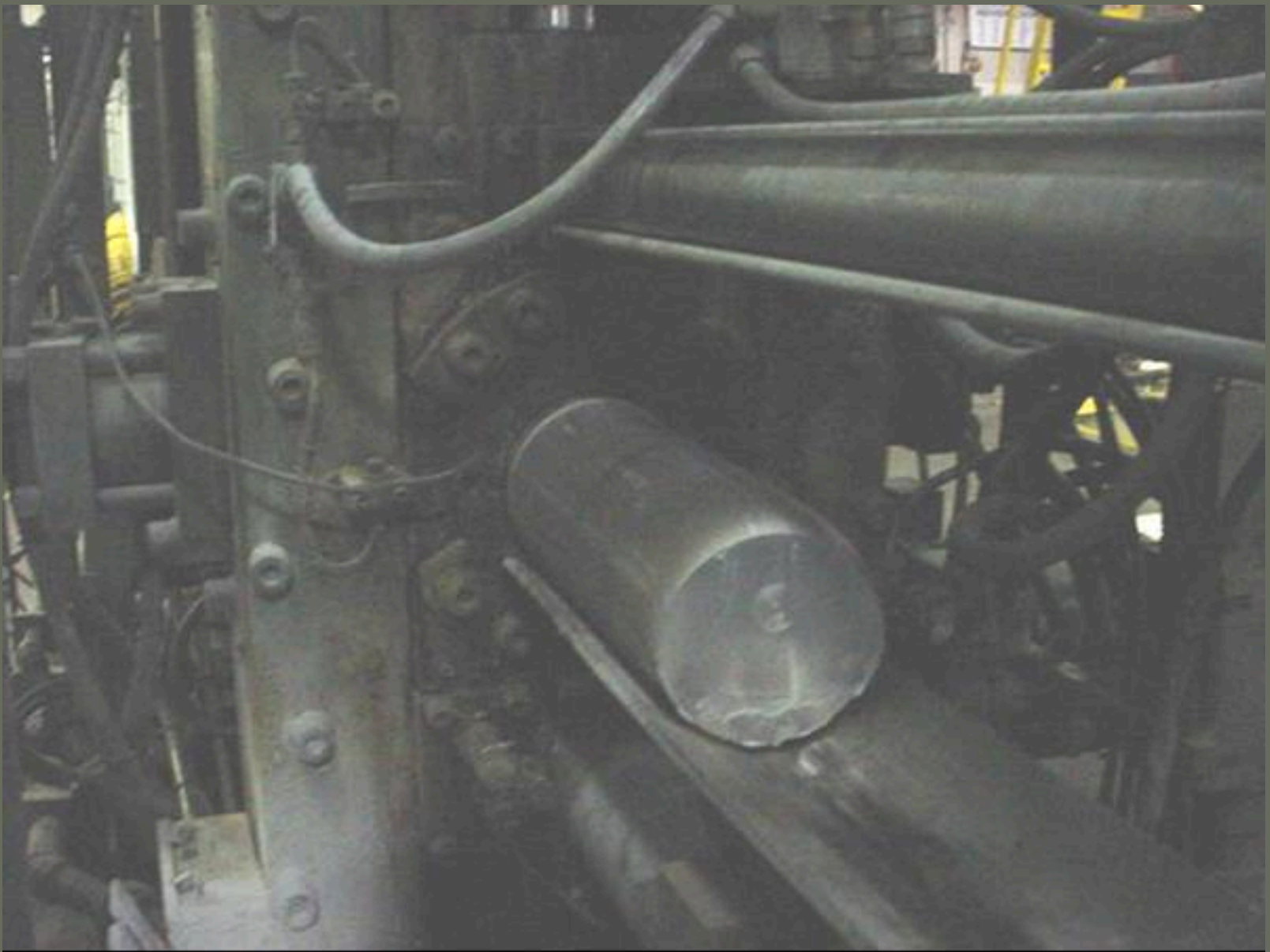
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ALUMINUM EXTRUSION PROCESS

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ALUMINUM EXTRUSION PROCESS

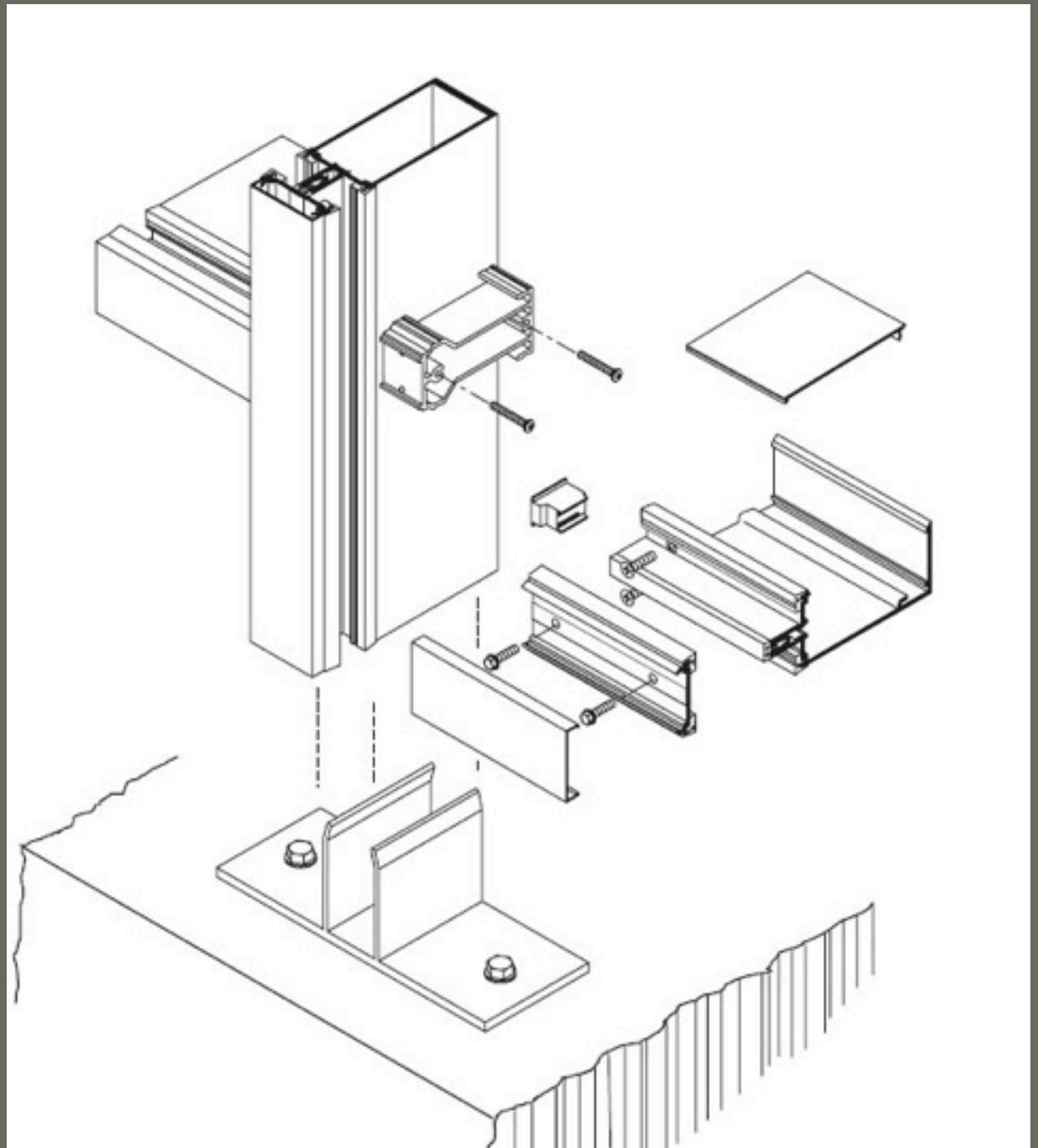
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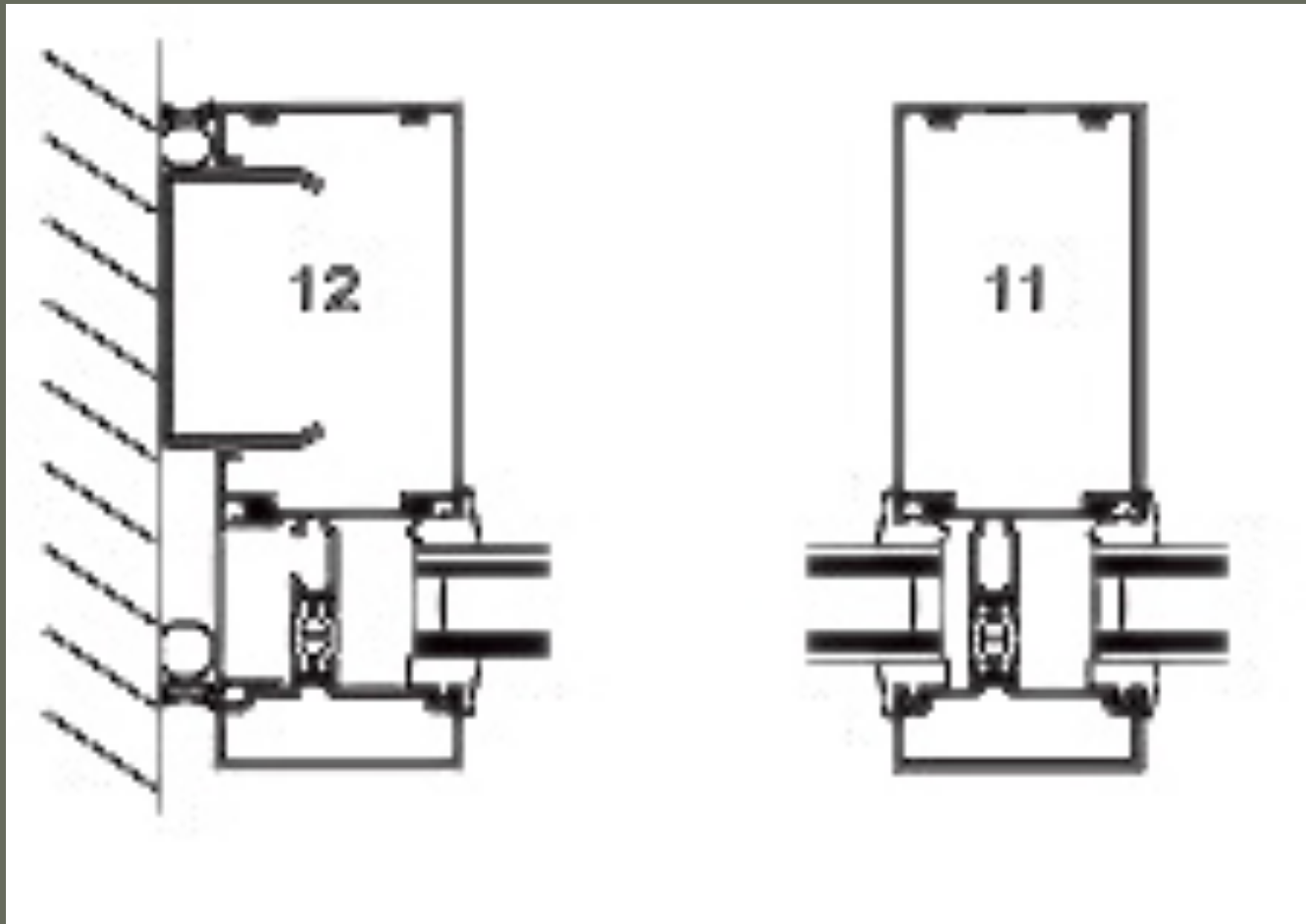


Aluminum Extrusions



# Components of an Aluminum Curtain Wall Frame System





Thermal Break in an Aluminum Curtain Wall Mullion



Storefront  
Systems



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# Storefront Systems



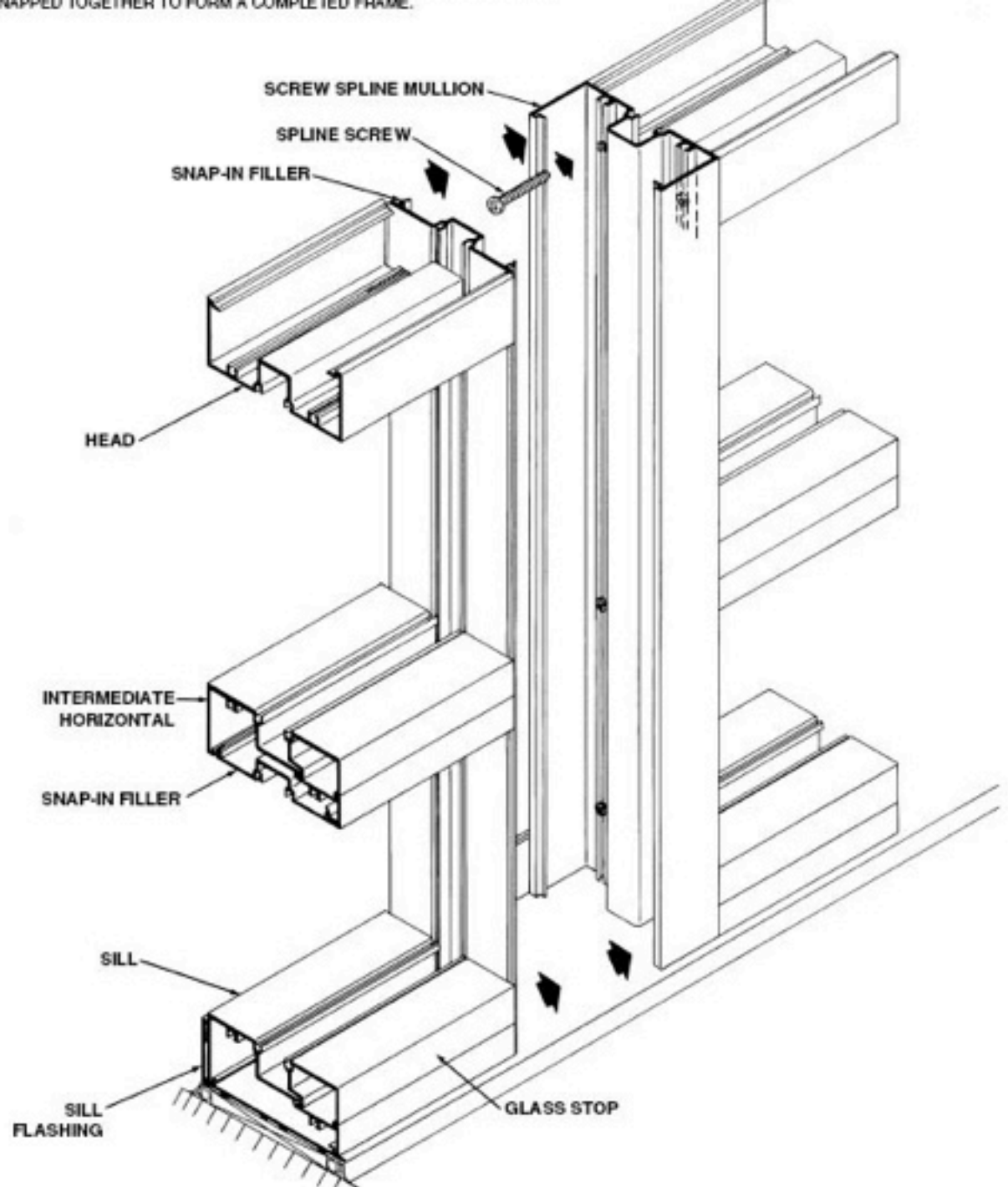
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# Storefront System

frame elements

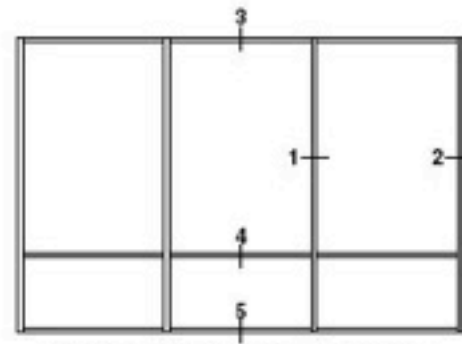
SNAPPED TOGETHER TO FORM A COMPLETED FRAME.



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# Storefront System

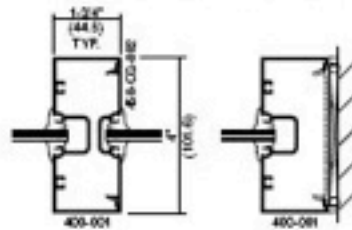
component details



ELEVATION IS NUMBER KEYED TO DETAILS

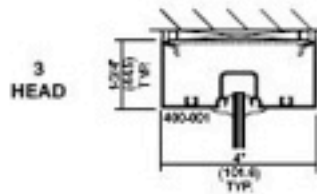
## SCREW SPLINE SYSTEM

CAD DETAILS = Trifab\_400\_pg01.dwg



1  
VERTICAL  
MULLION

2  
JAMB



3  
HEAD



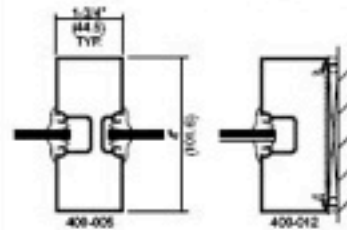
4  
INTERMEDIATE  
HORIZONTAL



5  
SILL

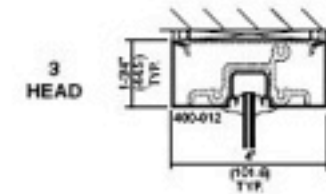
## SHEAR BLOCK SYSTEM

CAD DETAILS = Trifab\_400\_pg02.dwg

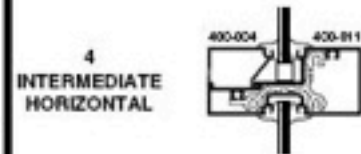


1  
VERTICAL  
MULLION

2  
JAMB



3  
HEAD



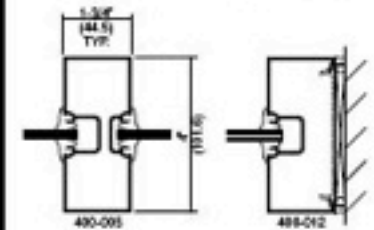
4  
INTERMEDIATE  
HORIZONTAL



5  
SILL

## STICK SYSTEM

CAD DETAILS = Trifab\_400\_pg03.dwg



1  
VERTICAL  
MULLION

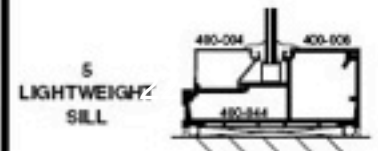
2  
JAMB



3  
LIGHTWEIGHT  
HEAD



4  
INTERMEDIATE  
HORIZONTAL



5  
LIGHTWEIGHT  
SILL

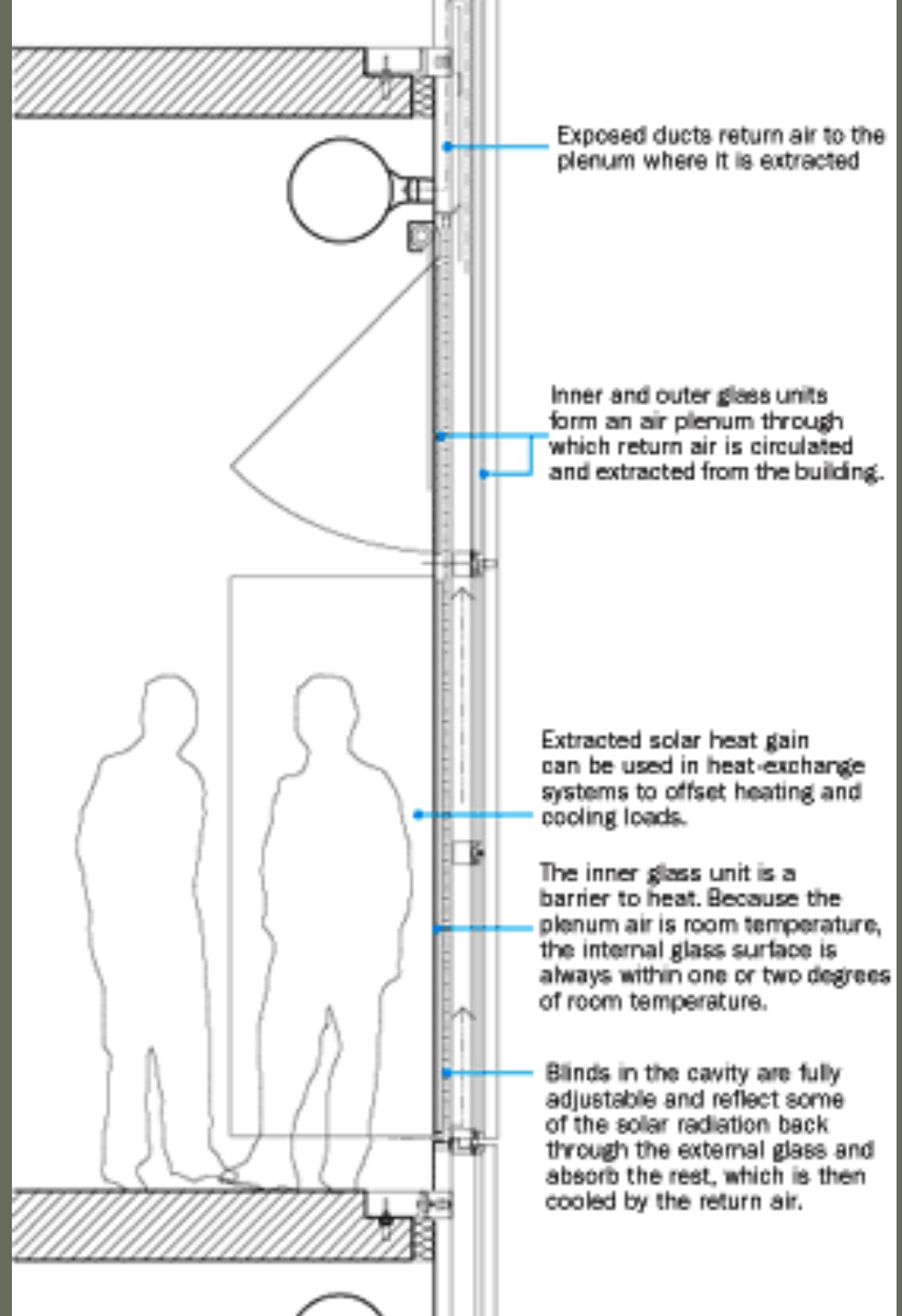


# Curtain Wall Systems



# Curtain Wall Systems

Installed beyond slab edge





# Curtain Wall Systems

Installed beyond slab edge



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# Curtain Wall Systems

multiple layers

glazing + solar  
screen







Curtain Wall Systems: primary and secondary structure

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# Curtain Wall Systems

double skin  
facade

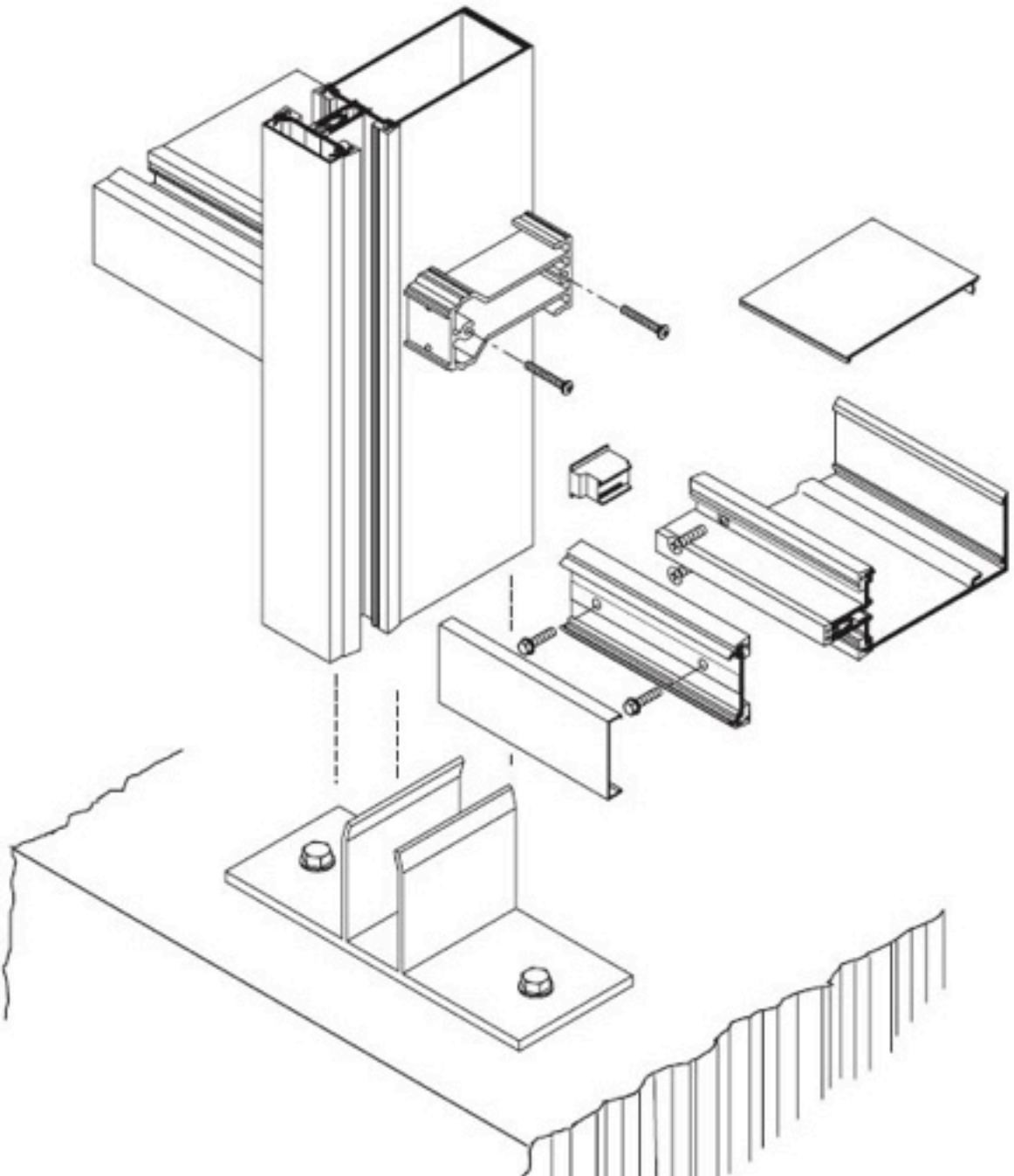


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# Components of an Aluminum Curtain Wall Frame System

- structural frame
- glazing pocket
- thermal break
- pressure plate
- shear block
- glazing gaskets
- snap on cover



# Curtain Wall Systems

## Basic Mullion Details at View Panels and Spandrel Panels

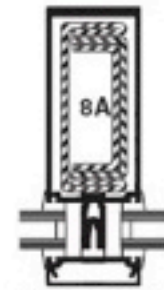
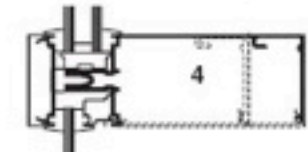
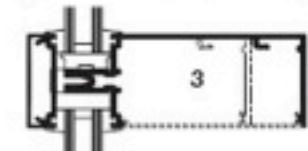
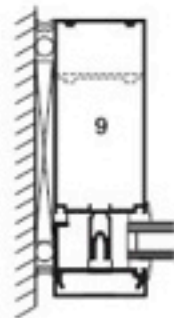
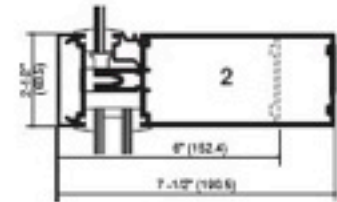
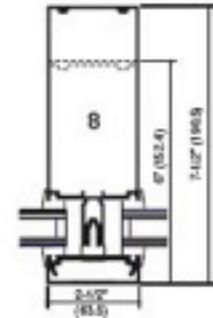
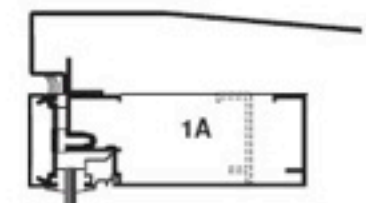
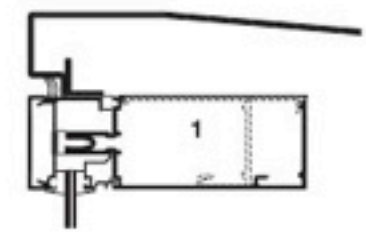
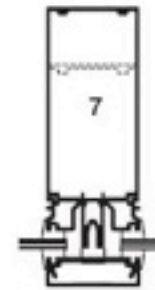
outside glazed system

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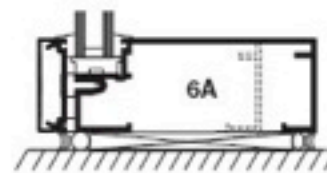
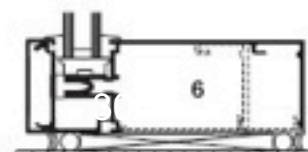
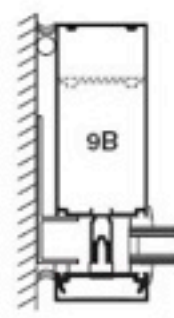
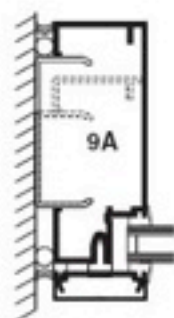
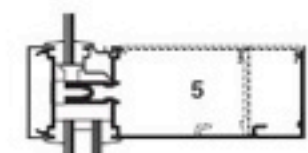
SCALE 3" = 1'-0"



ELEVATION IS NUMBER KEYED TO DETAILS

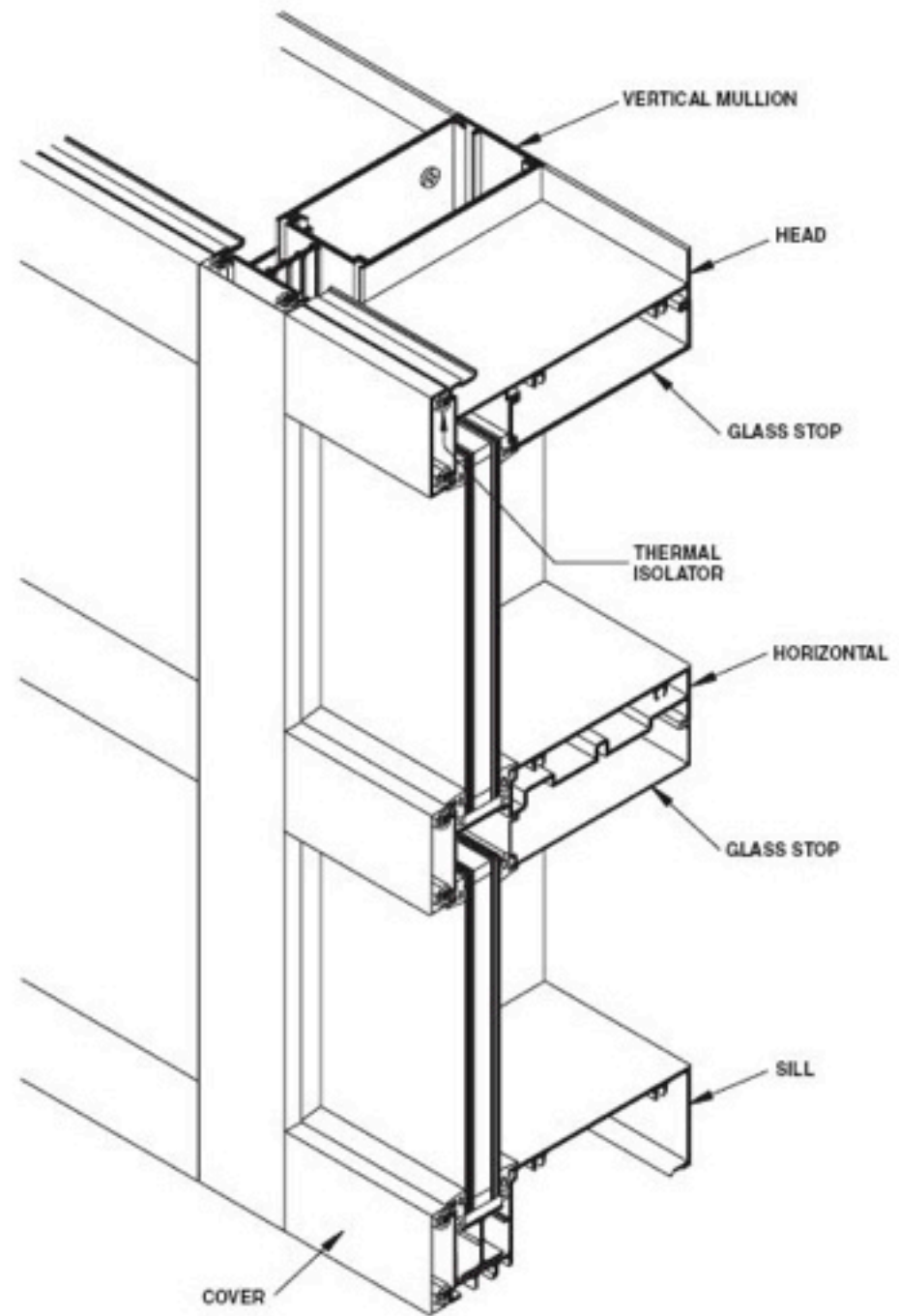


OPTIONAL STEEL REINFORCING AS REQUIRED



# Curtain Wall Systems

inside glazed system

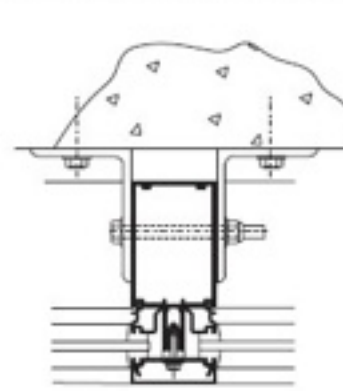




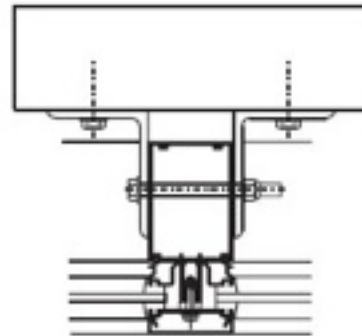
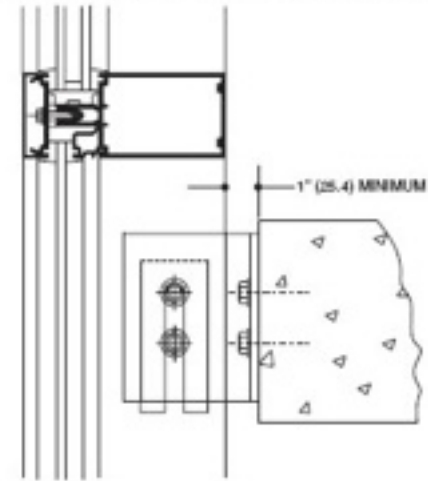
# Curtain Wall Systems

## anchoring details

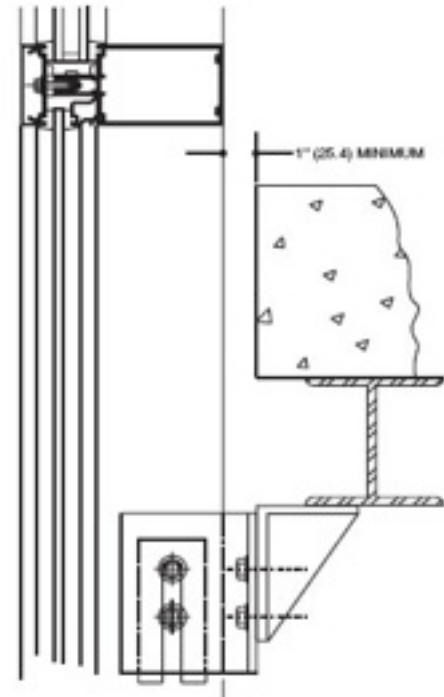
Actual project conditions will determine specific anchor design. Details on this page are for reference only.



ANCHORING TO FLOOR SLAB



ANCHORING TO SUPPORT STEEL





Curtain Wall Systems: stick system framing

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# Curtain Wall Systems

stick system

outside glazing installation





# Curtain Wall Systems

stick system

outside glazing  
installation



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# Curtain Wall Systems

unit system  
installation

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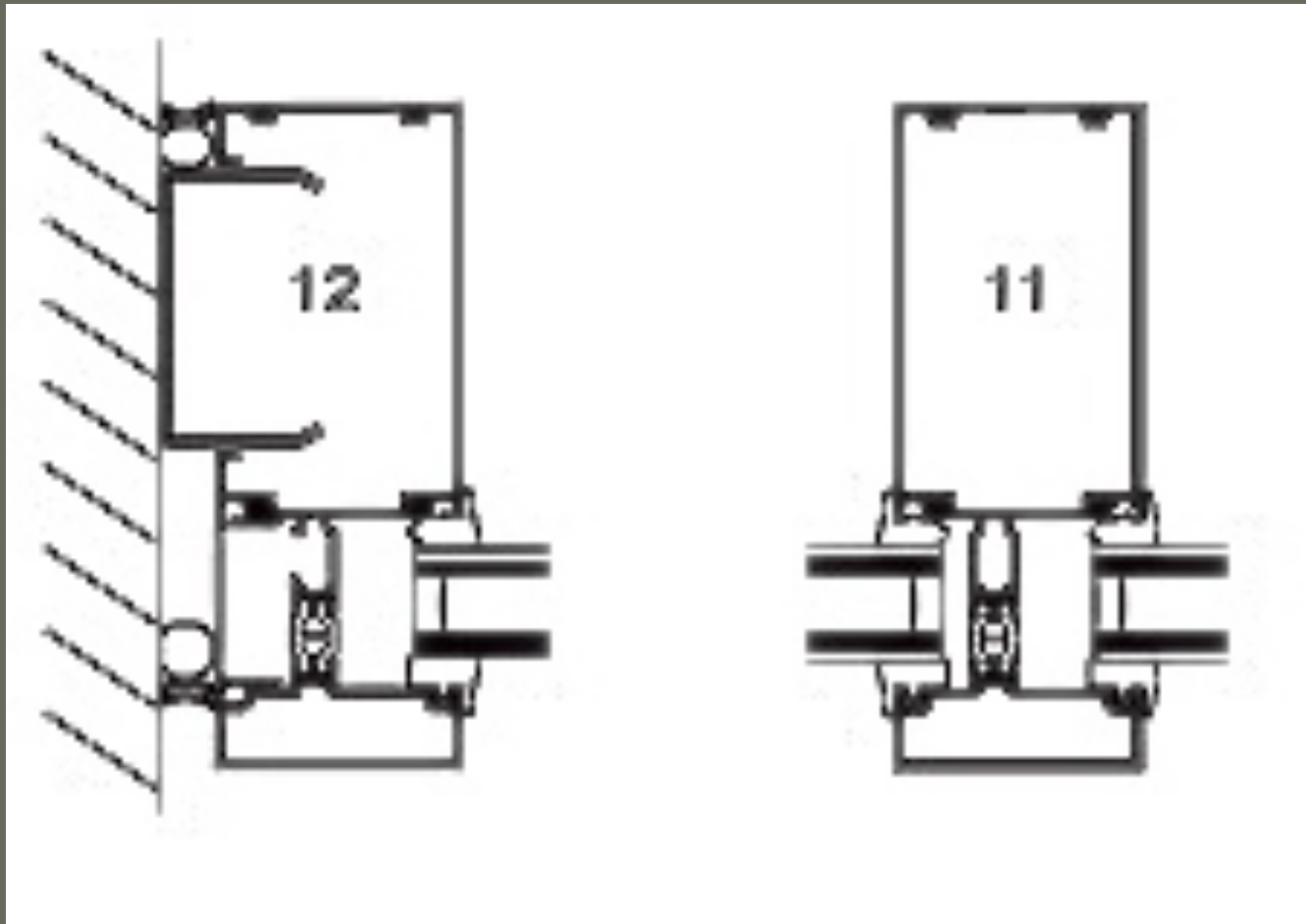


## Curtain Wall Systems

concrete frame  
with anchoring  
for curtain wall at  
top of slab





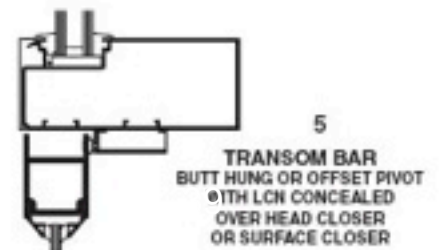
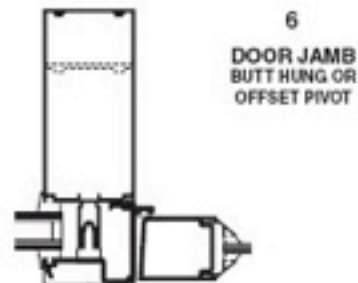
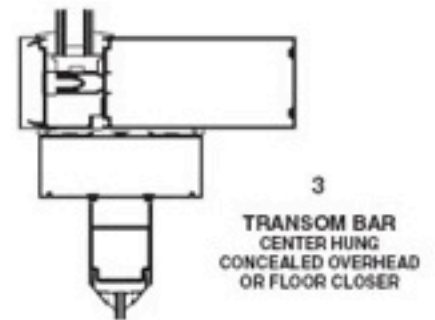
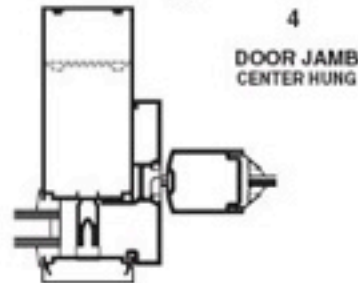
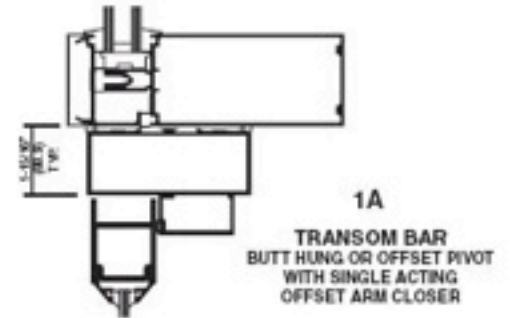
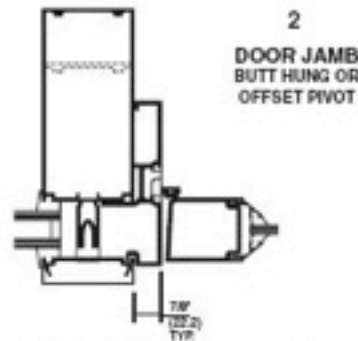
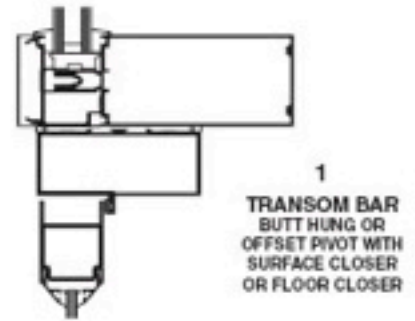
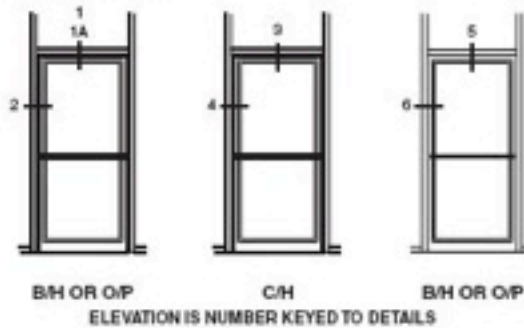


Inside Glazed Curtain Wall System Mullion Details  
Rainscreen Principal - pressure equalization chamber

# Curtain Wall Systems

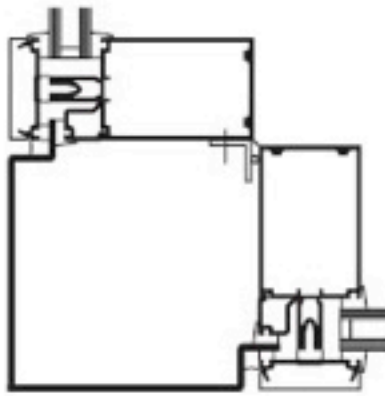
operating window ("vent") installed within curtain wall system

SCALE 3" = 1'-0"

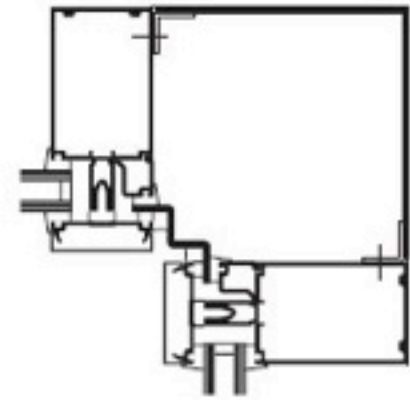


# Curtain Wall Systems

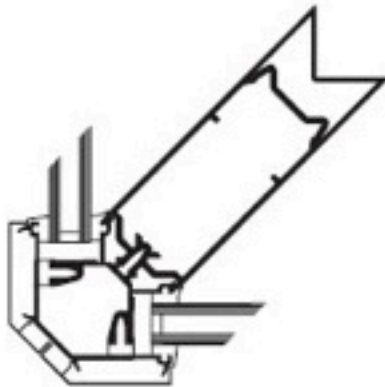
corner details



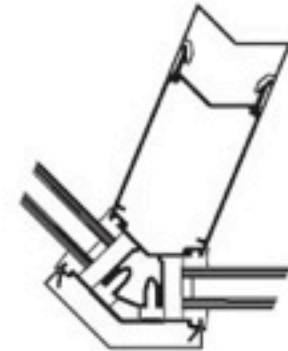
90° OUTSIDE CORNER



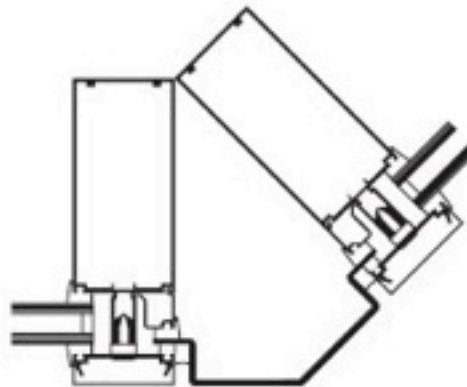
90° INSIDE CORNER



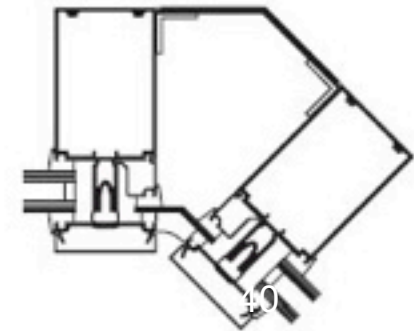
90° OUTSIDE CORNER



135° OUTSIDE CORNER



135° OUTSIDE CORNER

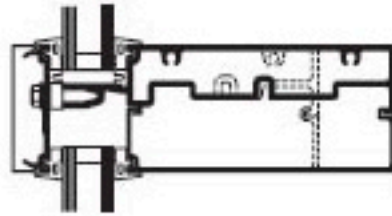


135° INSIDE CORNER



# Curtain Wall Systems

optional details



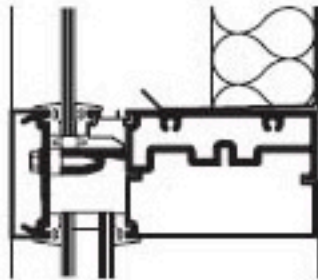
PRESSURE PLATE HORIZONTAL  
FOR OUTSIDE GLAZING



PRESSURE PLATE VERTICAL  
FOR OUTSIDE GLAZING



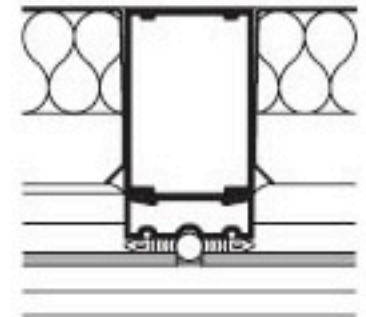
STEEL REINFORCING



BACKPAN HORIZONTAL



BACKPAN VERTICAL

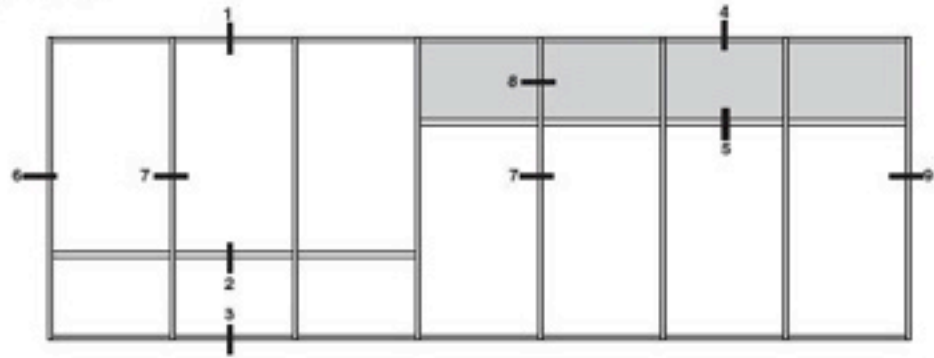


BACKPAN SSG VERTICAL

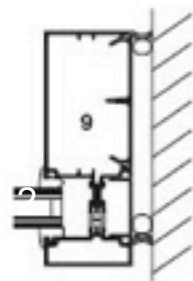
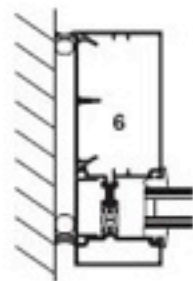
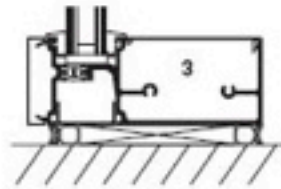
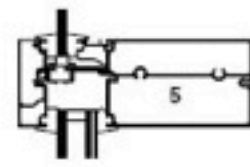
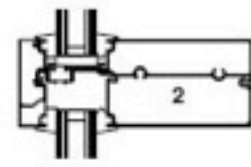
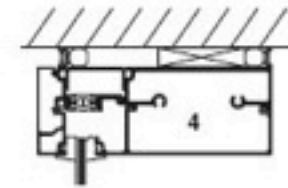
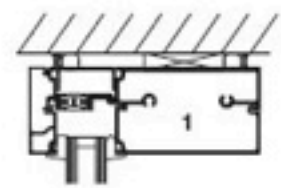
# Curtain Wall Systems

mullion details

SCALE 3/8" = 1'-0"



**RIBBON ELEVATION**  
ELEVATION IS NUMBER KEYED TO DETAILS

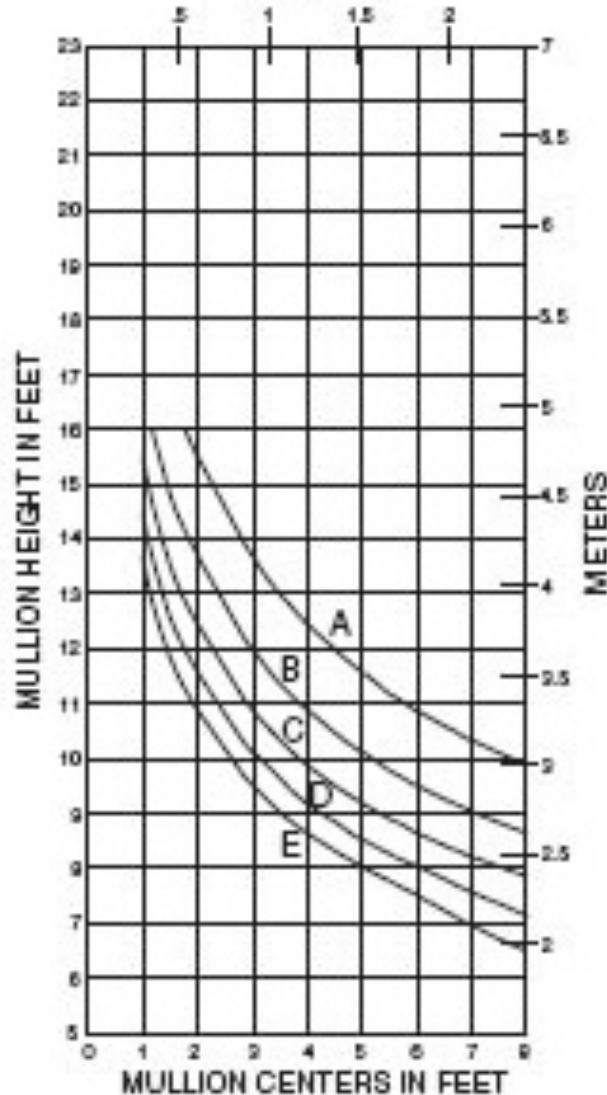


# Curtain Wall Systems

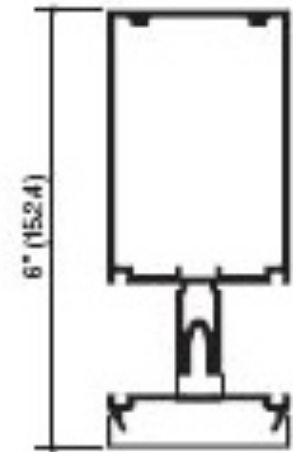
sizing mullions based on wind loads

## SINGLE SPAN

METERS



- A = 20 PSF (960)
- B = 30 PSF (1440)
- C = 40 PSF (1920)
- D = 50 PSF (2400)
- E = 60 PSF (2880)



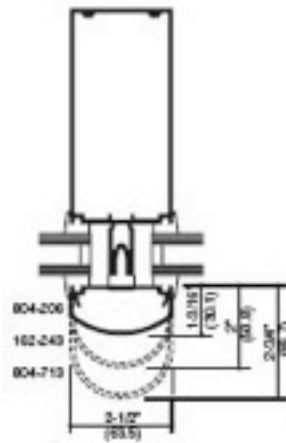
162-001

$I = 5.035 (209.57 \times 10^6)$   
 $S = 1.993 (32.66 \times 10^3)$

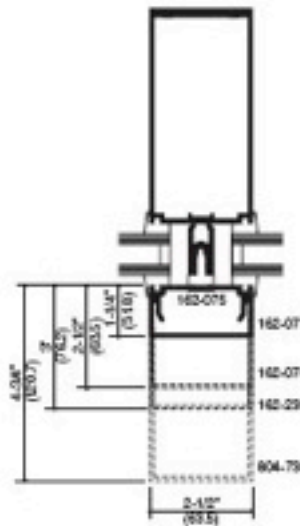


# Curtain Wall Systems

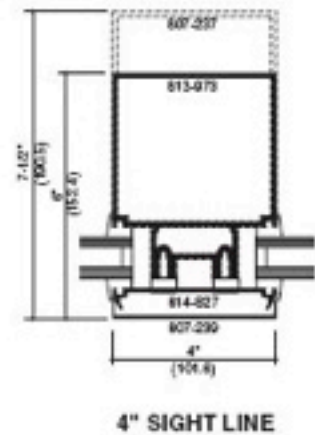
optional details



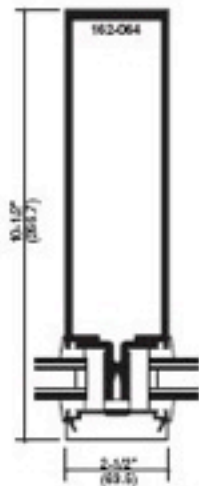
OPTIONAL COVERS



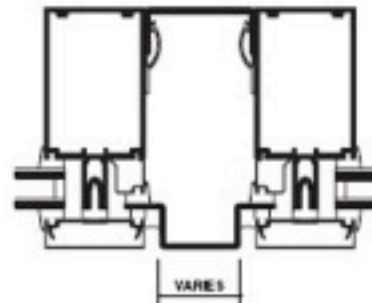
OPTIONAL COVERS



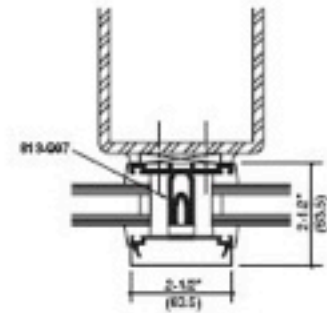
4" SIGHT LINE



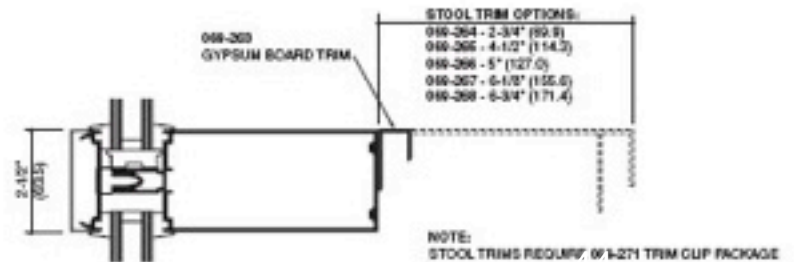
DEEP MULLION



DOUBLE MULLION



VENEER SYSTEM



INTERIOR STOOL TRIM

- STOOL TRIM OPTIONS:
- 068-264 - 2-3/4" (69.9)
  - 068-265 - 4-1/2" (114.3)
  - 068-266 - 5" (127.0)
  - 068-267 - 6-1/2" (165.0)
  - 068-268 - 6-3/4" (171.4)

NOTE:  
STOOL TRIMS REQUIRE 6" T-271 TRIM CLIP PACKAGE

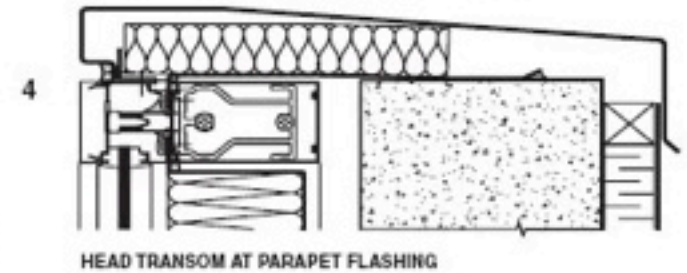
# Curtain Wall Systems

## parapet detail

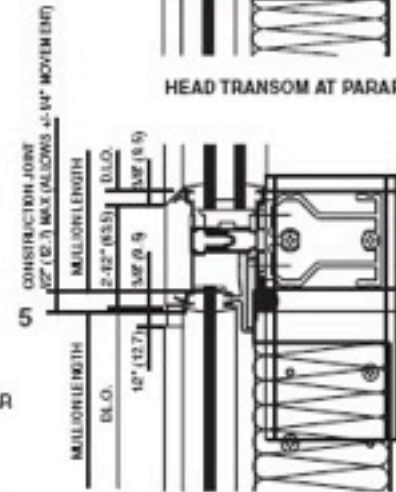


ELEVATION IS NUMBER KEYED TO DETAILS

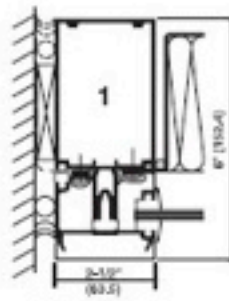
NOTE: 6" SYSTEM SHOWN, 7-1/2" SYSTEM SIMILAR



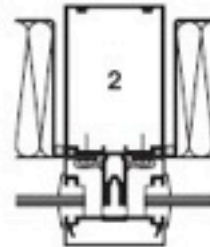
HEAD TRANSOM AT PARAPET FLASHING



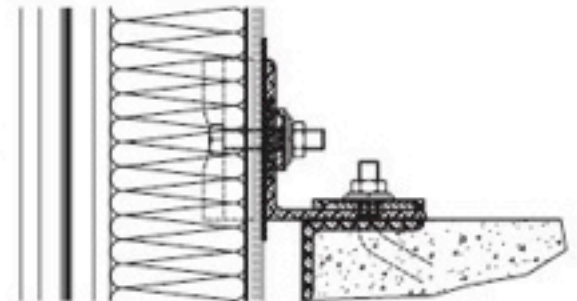
EXPANSION JOINT



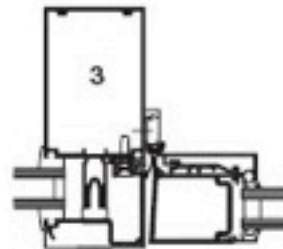
JAMB MULLION AT SPANDREL



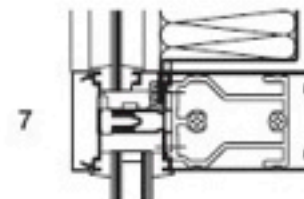
MULLION AT SPANDREL



TYPICAL DEADLOAD ANCHOR



THERMALLY BROKEN DOOR ADAPTOR FOR INSULCLAD DOORS



TRANSOM - SPANDREL OVER VISION

# summary

aluminum is  
material of choice

complex systems  
require expert  
guidance

coordination of  
installation

requires adjustment  
and allowance for  
movement

