Subject: BUILDING MATERIALS AND PROCESSES – II

Topic: Glass and Glazing

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Glass & Glazing part -2

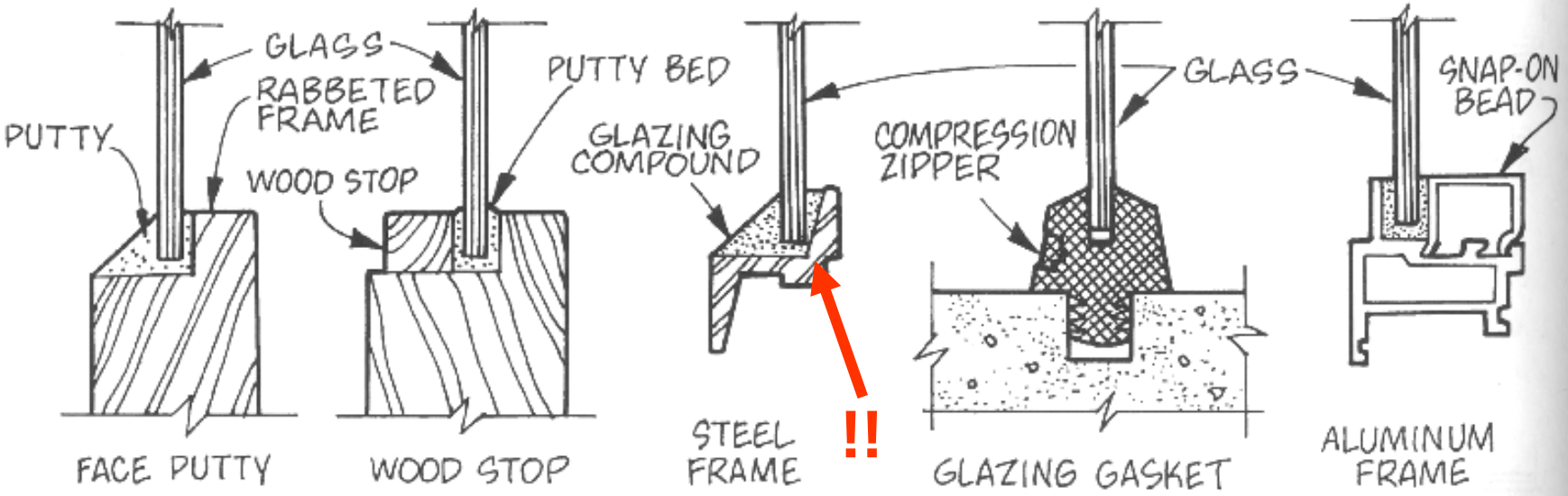
Glazing

- Glazing details
- Curtainwalls
- Storefronts
- Structural Glass walls
  - spider fittings
  - rigid supports
  - cable supports
  - structural glass fins

Glazing

- Glazing is the process of placing glass into profiles designed to receive them, then held in place with glazing clips, blocks and compounds making a weather tight joint between the glass and frame.

- Proper glazing keeps the glass from contacting the frame during thermal expansion of the glass or the frame and during loading due to wind, snow, rain or seismic forces.



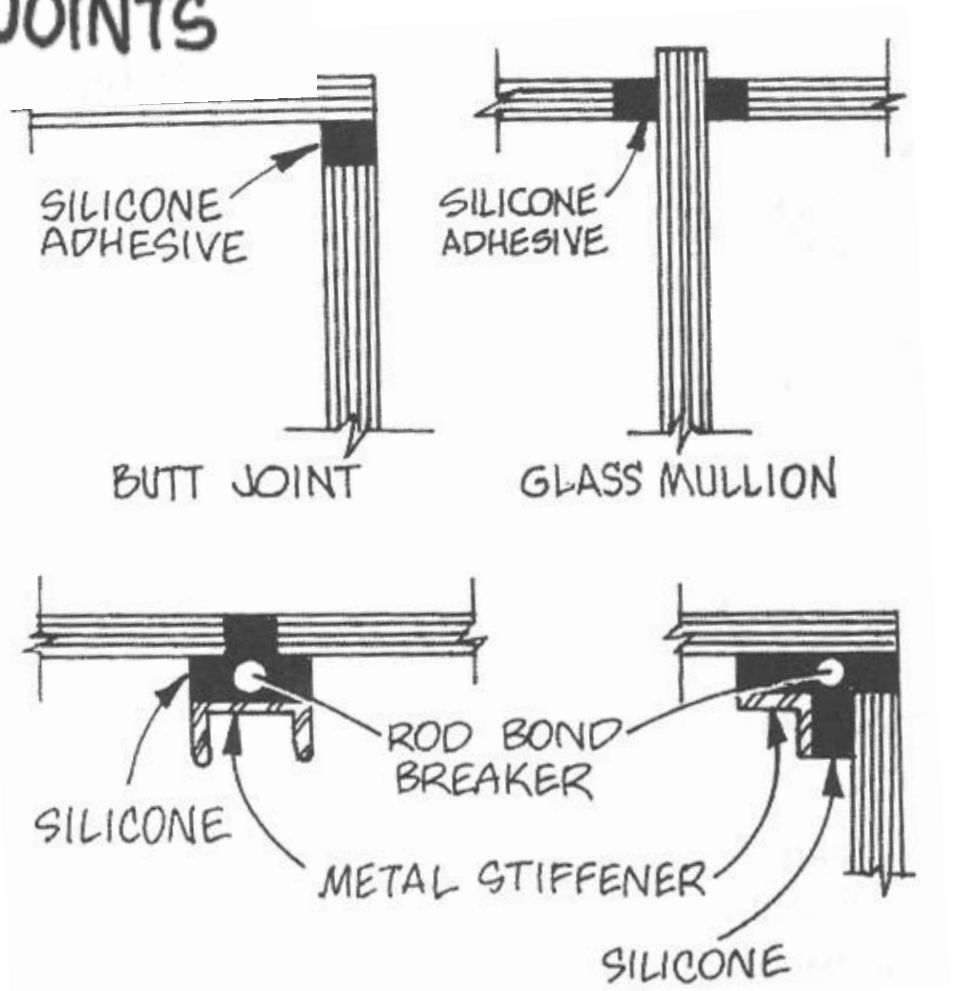
GLAZING DETAILS

Clearance must always be allowed between glass and frame so that the glass is surrounded by a watertight seal of glazing compound. In addition, glass must never be placed in tension, by exposing it to greater forces than it can safely withstand, nor should glazing take place when moisture might be trapped, which could cause the watertight seal to fail.

- Synthetics for installing glazing, **rubber, neoprene & vinyl** are particularly effective in allowing for the thermal expansion and contraction of glass:

GLASS-TO-GLASS JOINTS

Used when the Architect desires a clean unbroken exterior surface for the glazing uninterrupted by the protrusion of mullions.



Silicone an excellent and frequently used material to secure glass. Proper control and placement is essential to create structural adhesion with **weatherproofing, thermal** and **load resistant** qualities. Silicone joints should be designed to perform on **two** opposing surface planes. This is achieved thru the use of spacers, bond breakers and backer rods.

Curtain Wall

A curtain wall is a building façade that does not carry any dead load from the building other than its own dead load. A curtain wall receives and resists loads that are incident upon it : wind, rain, snow and seismic forces. These loads are transferred to the main building structure through connections at floors or columns of the building. A curtain wall is designed to resist air and water infiltration.

Curtain walls are typically designed with extruded aluminum members. (the first curtain walls were made of steel). The aluminum frame is typically infilled with glass, providing vision, daylighting and aesthetic qualities. Thermal comfort and visual comfort are more difficult to control when using highly-glazed curtain walls.

Other common infills include: stone veneer, metal panels, louvers, and operable windows or vents.

- With aluminum and glass curtainwall systems, the vertical mullions are attached to the floors or beams at every floor in order to carry gravity and wind loads
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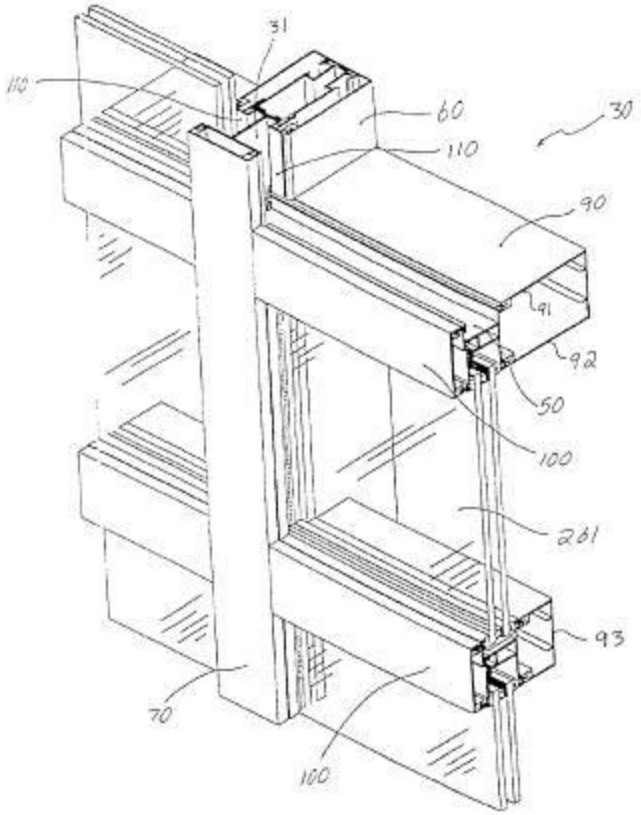


- Attachment devices allow the vertical mullions to be adjusted to provide a perfectly plumb and straight line for the entire height of the building.

Curtain wall system:

- Non load bearing
- Supported by floor framing
- Multi level spans
- Better thermal properties
- Resists high wind loads
- Higher aesthetic image

Storefront system:

- Gravity loads to foundation
- Ingress / egress
- Visual connection with street

Storefront:

- Head
- Jamb
- Mullion
- Sill

Storefront system sits at edge of interior floor slab and exterior walk

Framing:

•Extruded aluminum

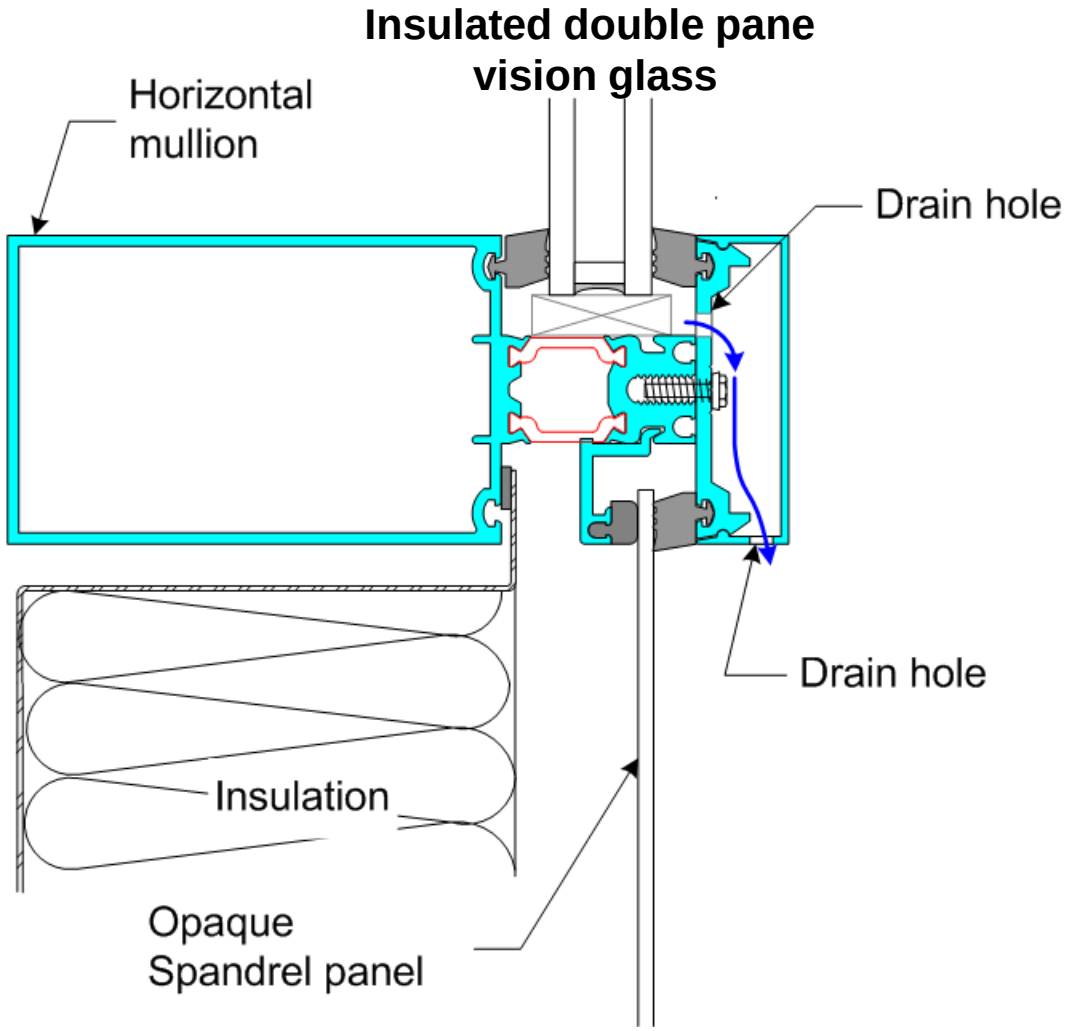
Glazing:

•Spandrel glass

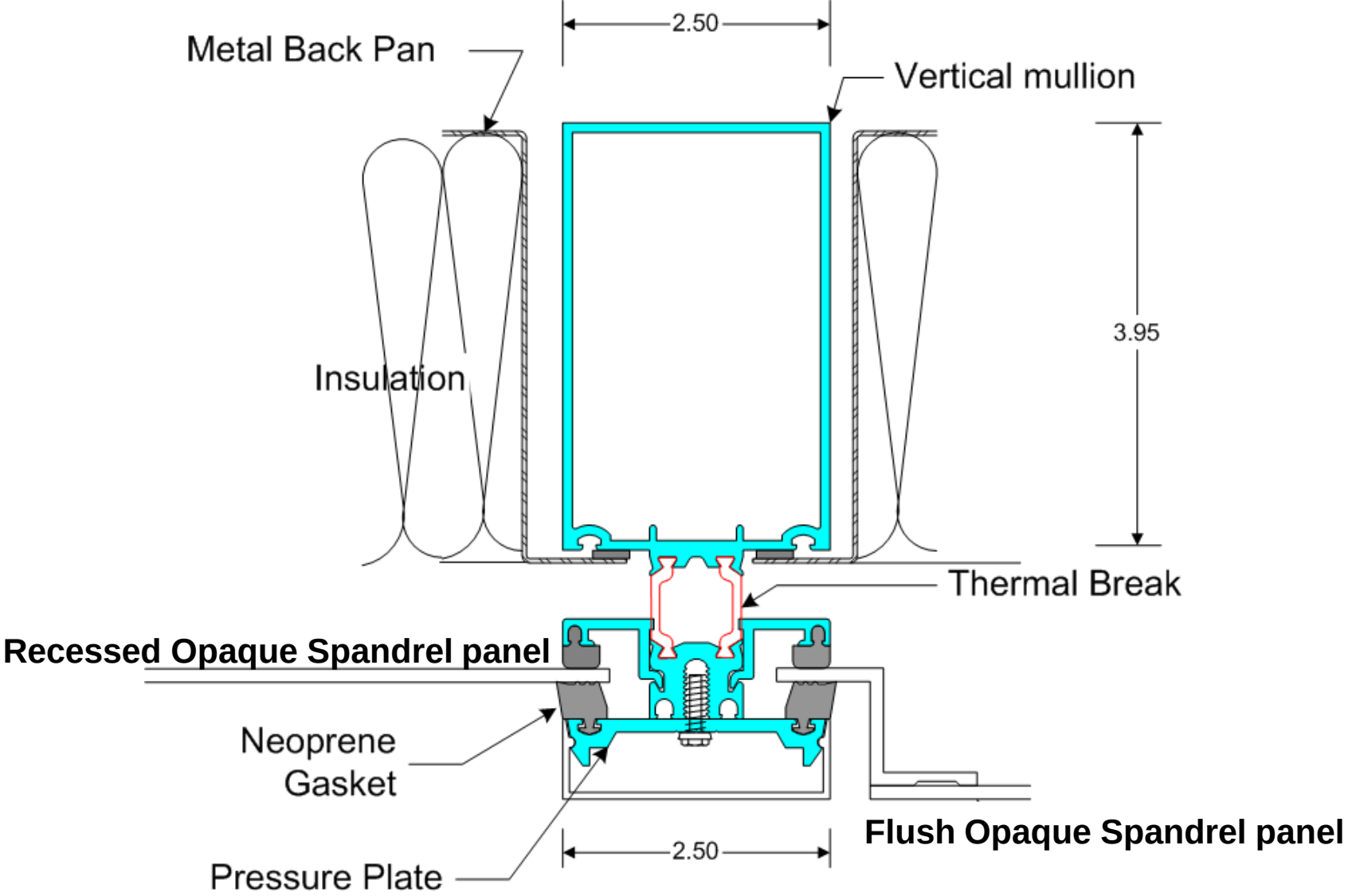
•Tinted glass

•Tempered glass

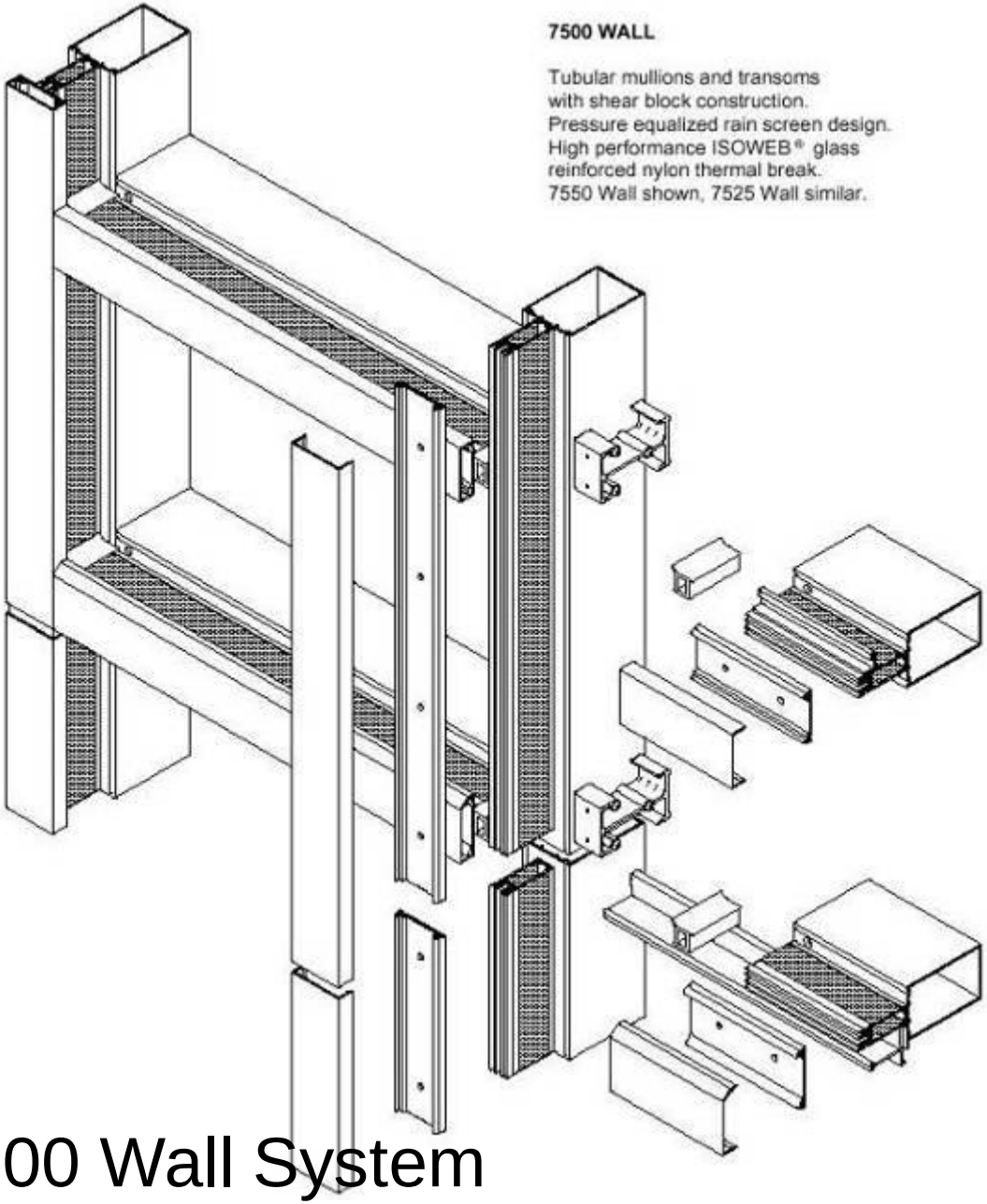
sample of aluminum curtainwall profiles



Vertical Section

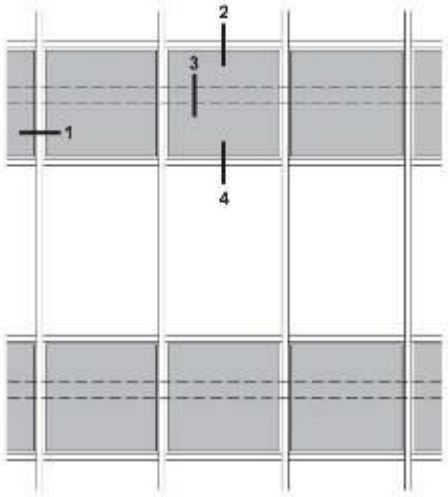


Horizontal Section below vision glass thru Spandrel panel

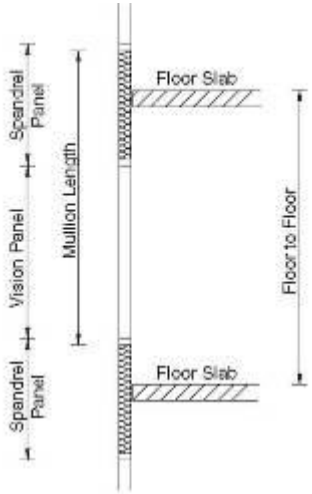


Kawner 7500 Wall System

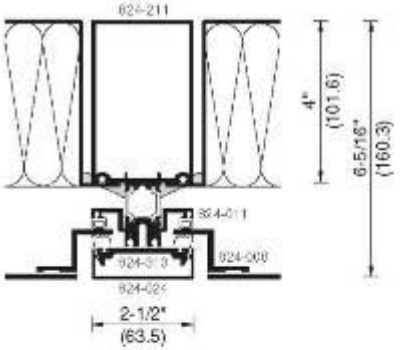
http://www.kawneer.com/kawneer/north_america/catalog/pdf/7500_Wall_E--A.pdf



ELEVATION IS NUMBER KEYED TO DETAILS

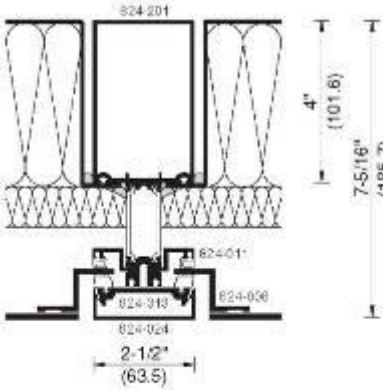


25mm DOUBLE GLAZED



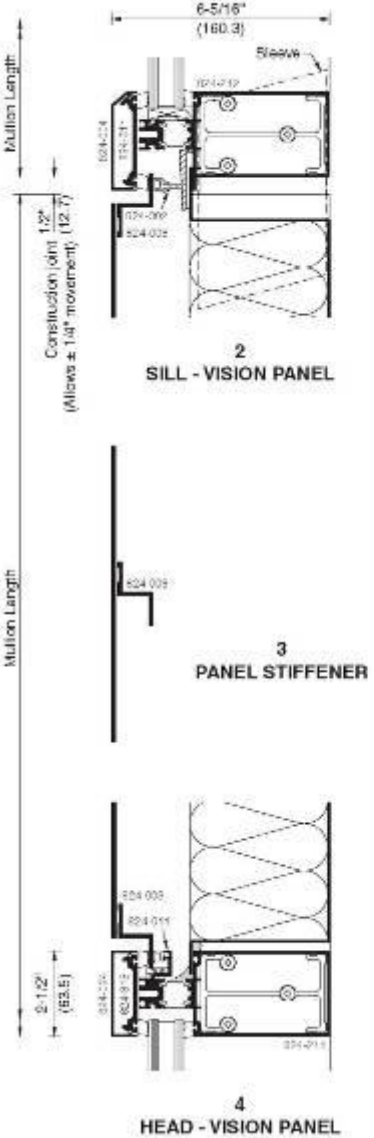
1
MULLION

7550 - 50mm TRIPLE GLAZED



1
MULLION

7525 - 25mm DOUBLE GLAZED

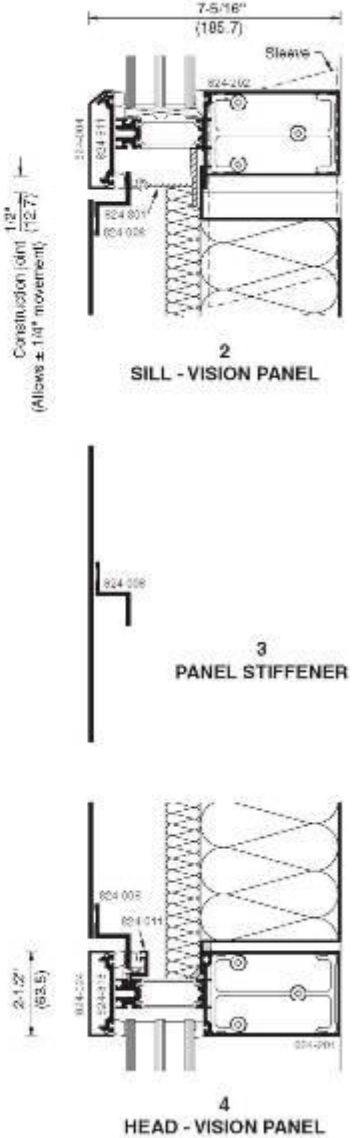


2
SILL - VISION PANEL

3
PANEL STIFFENER

4
HEAD - VISION PANEL

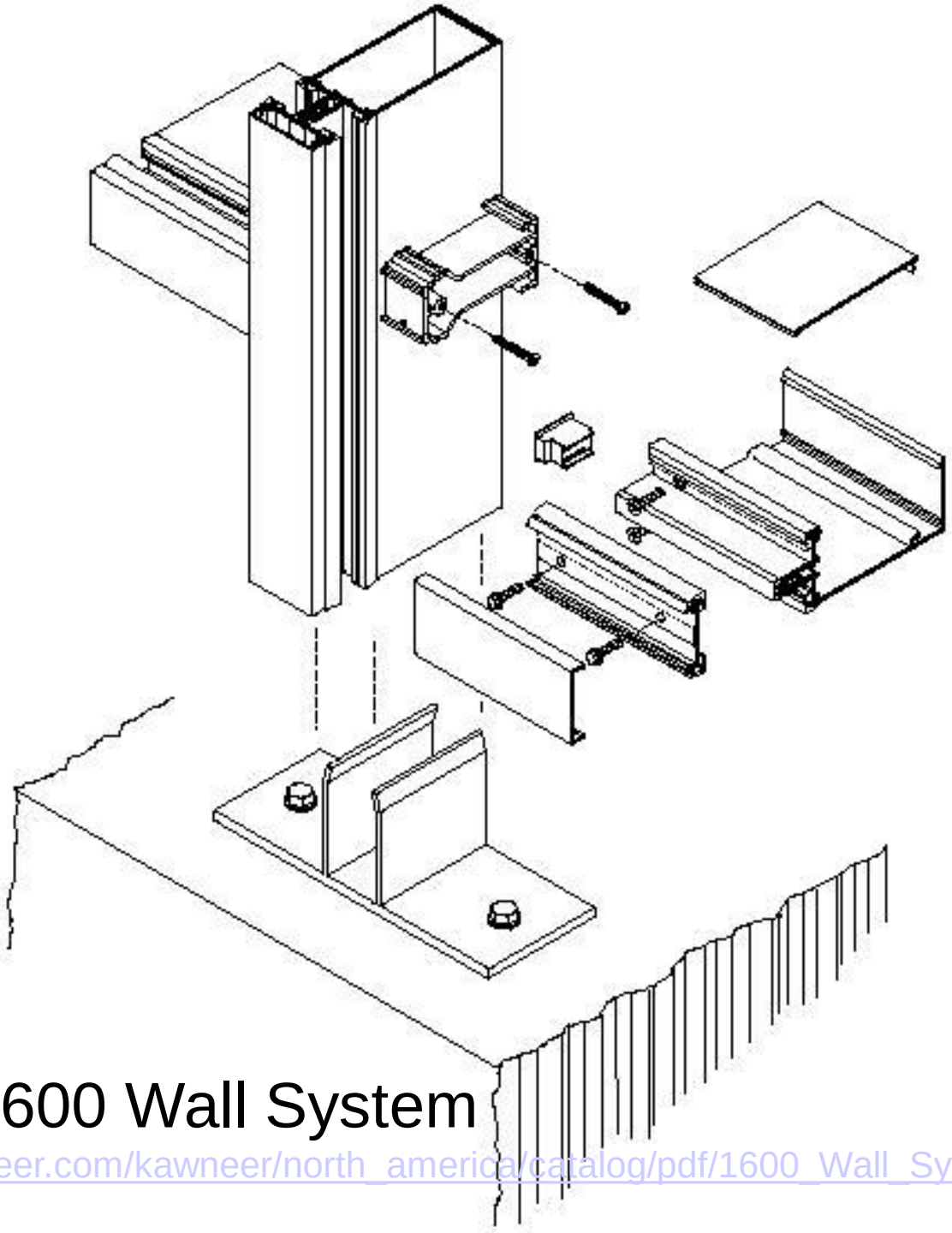
7550 - 50mm TRIPLE GLAZED



2
SILL - VISION PANEL

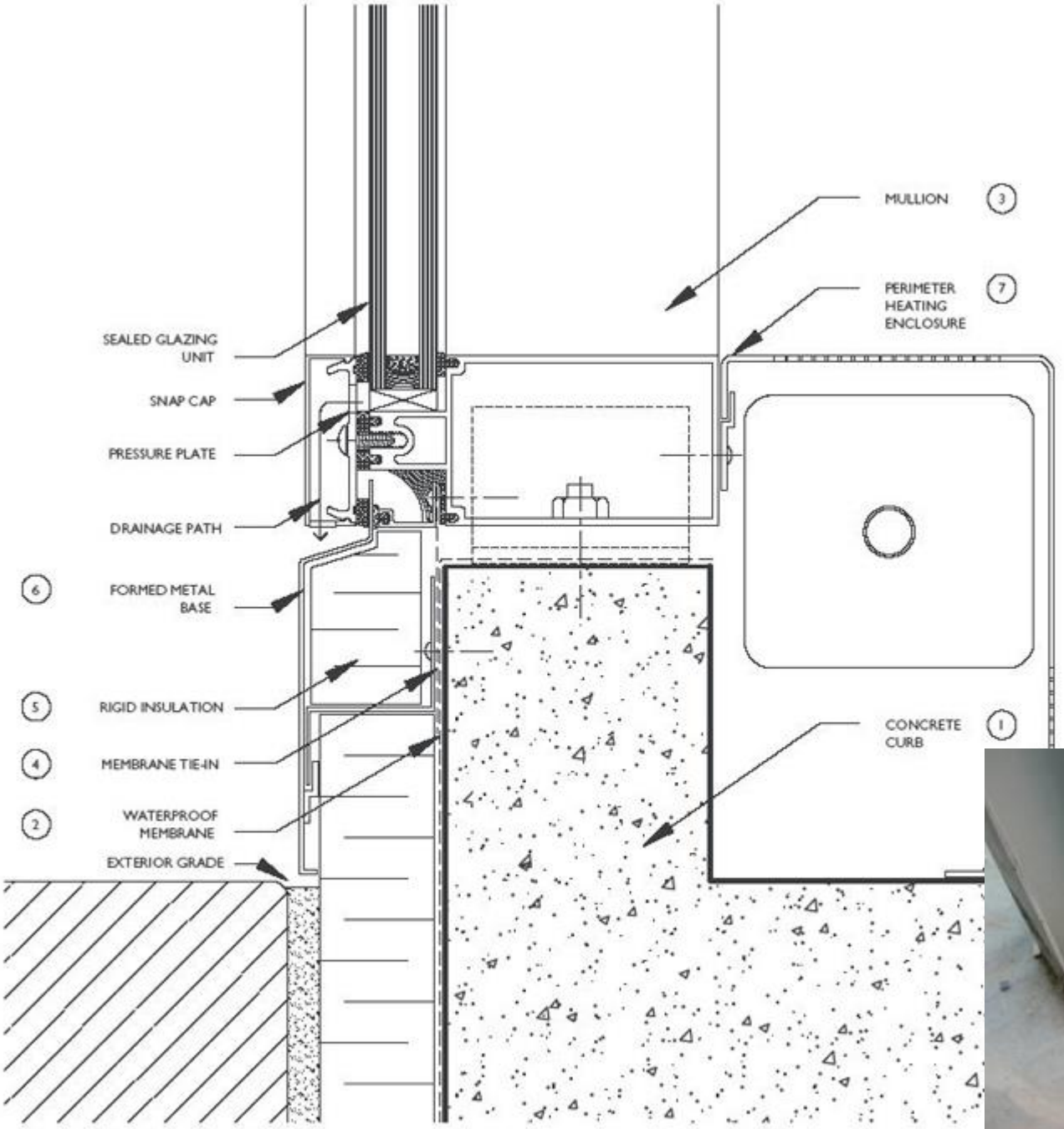
3
PANEL STIFFENER

4
HEAD - VISION PANEL



Kawner 1600 Wall System

http://www.kawneer.com/kawneer/north_america/catalog/pdf/1600_Wall_Sys1__E--A.pdf



TERMINATION AT GRADE


shims


Georgia-Pac
-Pacific

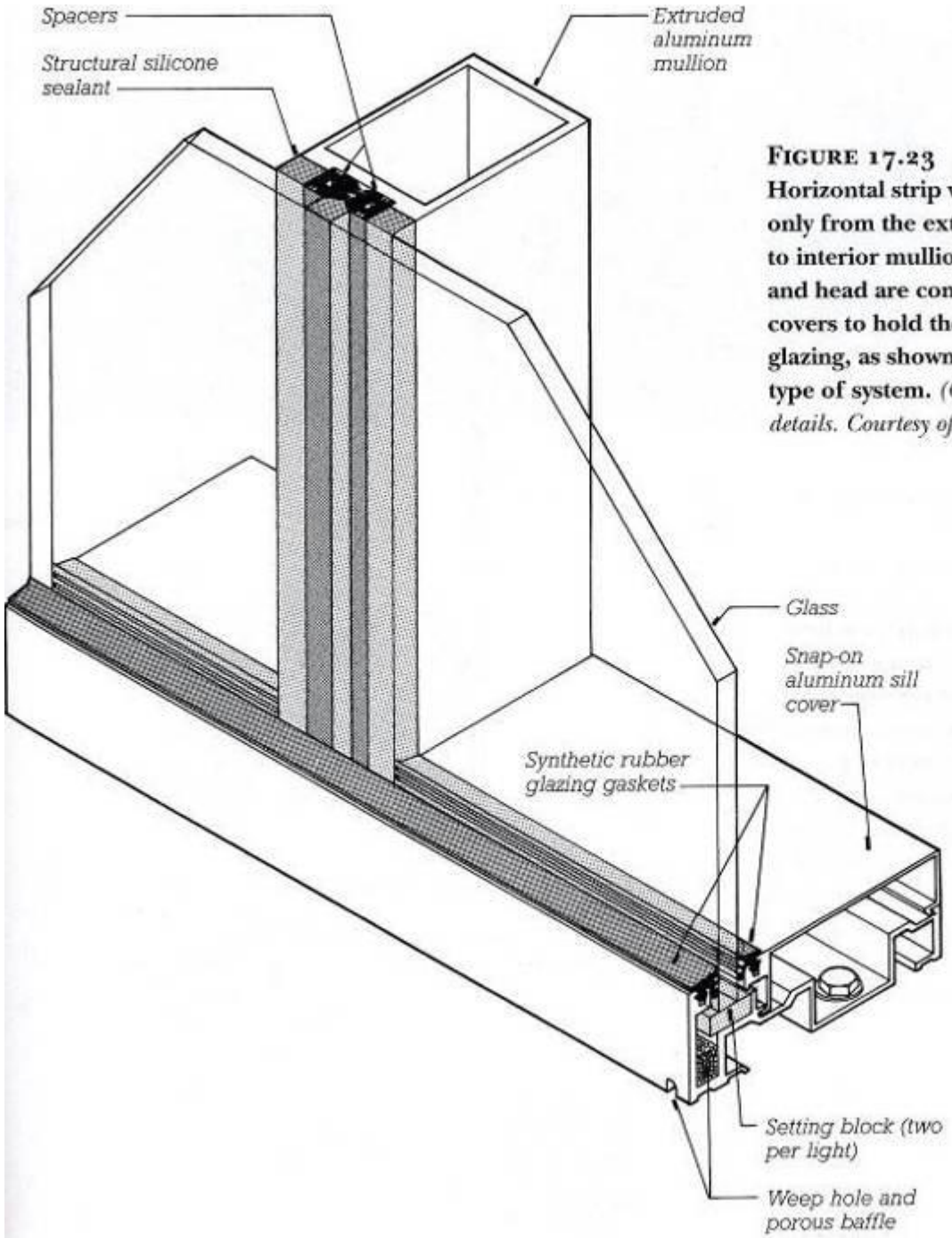
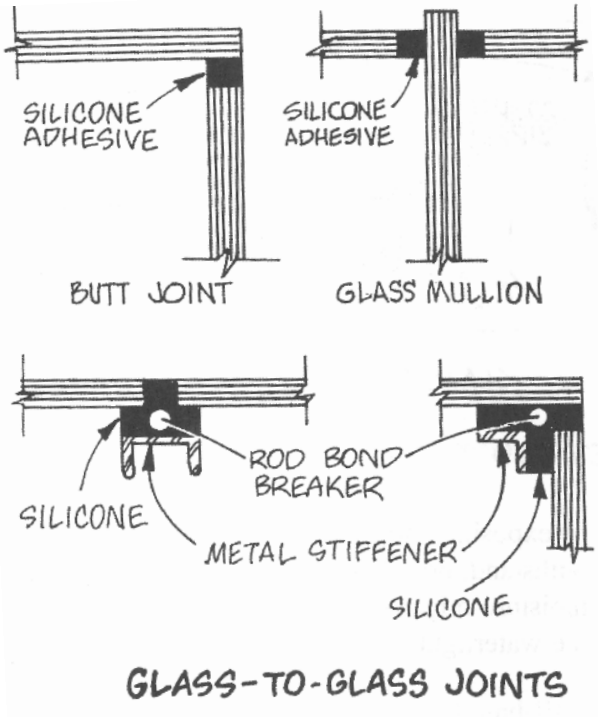


FIGURE 17.23
Horizontal strip windows that need to appear mullionless only from the exterior can be created by adhering the glass to interior mullions with structural silicone sealant. The sill and head are conventionally glazed, using snap-on aluminum covers to hold the interior glazing gaskets. Either single glazing, as shown, or double glazing can be used with this type of system. *(Copied by permission from PPG EFG System 401 details. Courtesy of PPG Industries)*



Williams Tower (Formerly Transco Tower) Architect Philip Johnson

Structural Glass Walls

A **structural glass wall** is made up of tempered glass sheets suspended from special clamps, or spider fittings. These fittings are stabilized against wind pressure by perpendicular stiffeners and/or cables and carry the glass loads

spider fittings-
used to hold tempered glass in structural glass walls

structural glass wall using spider fittings


structural glass wall using spider fittings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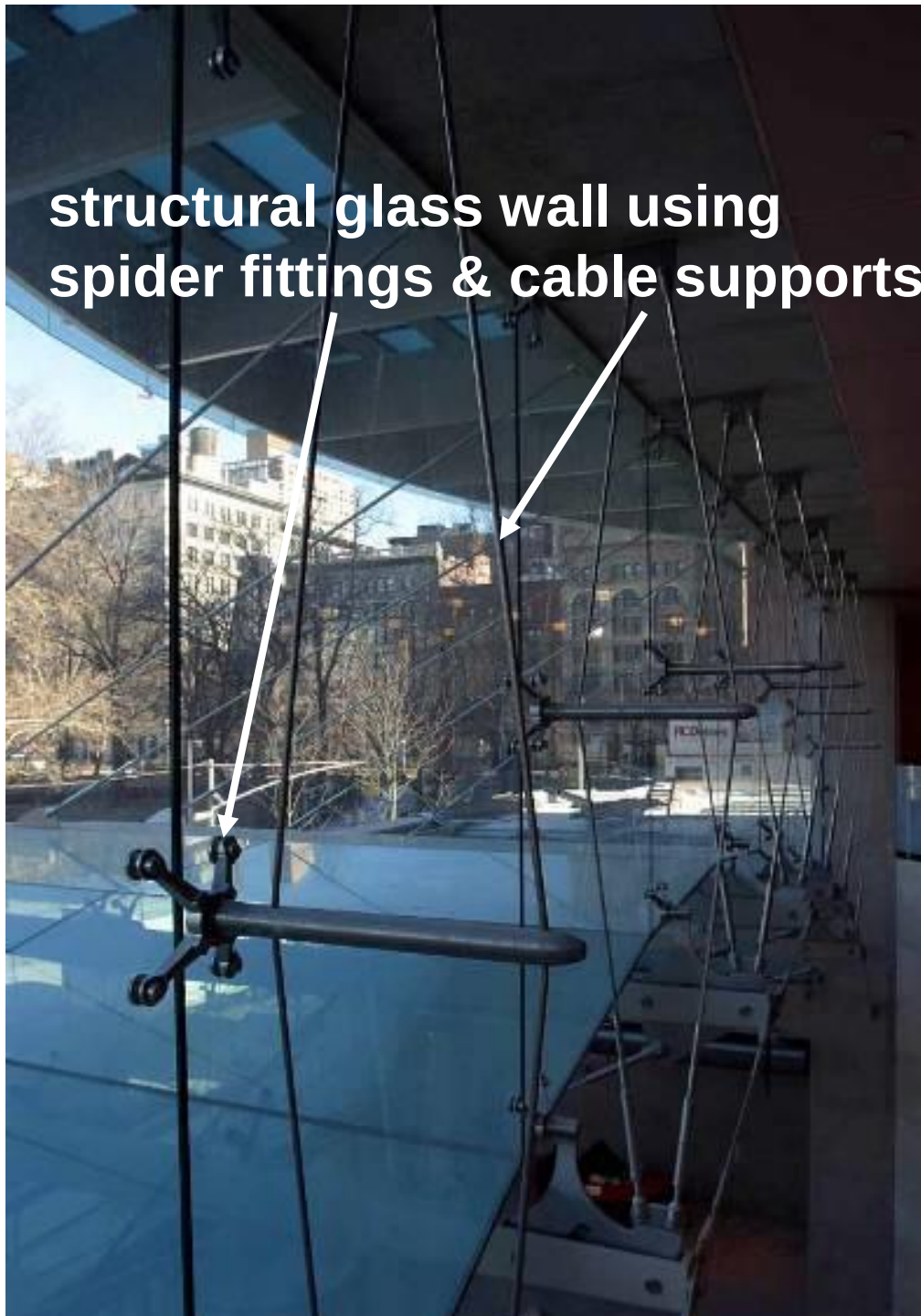
structural glass wall using
spider fittings & cable supports

Structural Glass Roof Panels

spider fittings and cable supports

Glass Fin System

Glass fins used as structural elements to carry glass gravity loads and wind loads.


one to one


NORTHBOUND
CYCLISTS
USE
BIKE BOX
3
COLUMBUS
UP TO 500,000 CONTIGUOUS RSF AVAILABLE
FULL FLOORS UP TO 33,000 RSF
8 AV
WINNER 10 TONY AWARDS!
BEST MUSICAL
BILLY
ELLIOT
THE MUSICAL
APOLLO
verizon

Questions- Glass & Glazing

- What is glass made of?
- What is laminated glass made of?
- What was the predominate glass type used before 1959?
- What was the predominate glass type used after 1959?
- What is annealed glass?
- What is the strength difference between annealed, tempered and heat strengthened?
- What is wire glass?
- What is fire-rated glass?
- What type of glass would be used on skylights?
- What is fritted glass?
- How are frits applied?
- What is spandrel glass?
- What is insulating glass?
- What are three qualities of insulating glass?
- What does the acronym “SHGC” stand for?
- What does ”low e” stand for?
- What does “low-e” do?
- What is the glass surface order?
- What is the difference between a curtainwall and a storefront ?
- What is a structural glass wall?
- What is a spider fitting?
- What are three ways to support a spider fitting?
- What is a thermal break in a curtainwall system?
- What are typical glazing materials to secure the glass in the frame?
- What are characteristics of a properly designed silicone joint?
- What are the coatings on mirrors?