

SET NO. _____

PRODUCT LITERATURE
CONSTRUCTION DOCUMENTS FOR:
ADMINISTRATION COMPLEX
REHABILITATION AND BUILDING ADDITIONS

BROWNSVILLE NAVIGATION DISTRICT
PORT OF BROWNSVILLE
BROWNSVILLE, TEXAS

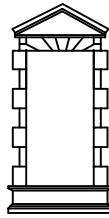
OWNER:

BROWNSVILLE NAVIGATION DISTRICT
1000 FOUST ROAD
BROWNSVILLE, TEXAS 78521-1000

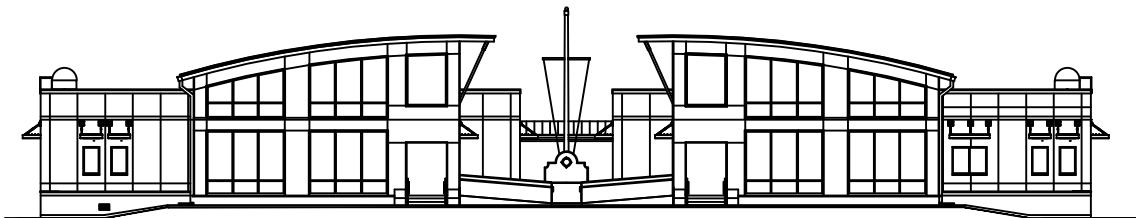
DATE:

SEPTEMBER 30, 2016

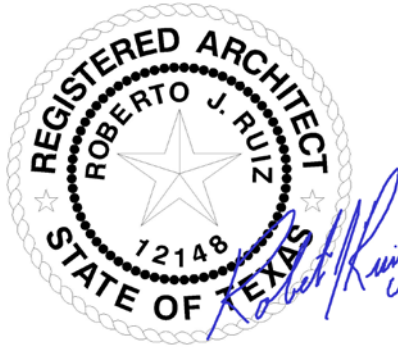
ROBERTO J. RUIZ
ARCHITECT, INC.



615 W. TANDY ROAD
BROWNSVILLE, TEXAS 78520
(956) 350-9195 OFFICE
(956) 350-9196 FAX
ARCH1RUIZ@AOL.COM



**BND ADMINISTRATION COMPLEX
REHABILITATION AND BUILDING ADDITIONS**



09/30/16

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**BND ADMINISTRATION COMPLEX
REHABILITATION AND BUILDING ADDITIONS**

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**BND ADMINISTRATION COMPLEX
REHABILITATION AND BUILDING ADDITIONS**

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**BND ADMINISTRATION COMPLEX
REHABILITATION AND BUILDING ADDITIONS**

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PRODUCT LITERATURE

THE FOLLOWING PRODUCT DATA INFORMATION SHALL BE
INCORPORATED INTO THIS PROJECT. ALTERNATE
SUBSTITUTIONS CAN SUBMITTED IN ACCORDANCE WITH THE
CONSTRUCTION DOCUMENT PROCEDURES.

ACCESS DOOR
ACOUSTICAL PANELS
AIR BARRIER
ALUMINUM GRILLES
ALUMINUM STOREFRONT
BULLET RESISTANT WINDOWS
CARPET TILE
CASH DRAWER
CAST STONE
COMPOSITE NAIL BASE INSULATED ROOF SHEATHING
CONCRETE TOPPING
CORNER GUARDS
CURTAIN WALL SYSTEMS
DOOR HARDWARE
DRY ERASE WALL
DRYVIT
EIFS
ENTRANCE FLOOR MATS
EXPANSION JOINTS

**BND ADMINISTRATION COMPLEX
REHABILITATION AND BUILDING ADDITIONS**

FIRE SEALANTS
FLAGPOLES
FLOOR ACCESS DOORS
FRP PANELS
GFRC
GLASS
KAWNEER
MASTIC DAMPPROOFING
METAL STUDS
METAL WALL PANELS
MODIFIED BITUMEN ROOF SYSTEM
PROJECTION SCREENS
RIGID INSULATION
ROOF HATCH AND LADDER
SLIDING DOOR GLASS TRACK
SLIDING FILE STORAGE SYSTEM
STAIR AND TREAD
STANDING SEAM METAL ROOF
STONE VENEER
SUSPENDED ACOUSTICAL CEILINGS
TERRAZZO
TILE
TRAFFIC FLOOR COATINGS
WALL COVERING
WALL GUARD
WINDOW TREATMENT

Standard Flush Door for Plaster Walls or Ceilings

✓ An expansion casing bead, included as part of the frame, provides a neat, protected finish between the frame and plaster, while furnishing added plaster reinforcement.

✓ The door panel finishes flush with the plaster surface, making an unobtrusive installation when painted, to match the surrounding wall or ceiling.

✓ The door panel is mounted to the frame with concealed spring hinges that open to 175 degrees for complete access without allowing the door to impact the surrounding surface.

✓ Available in gray prime-painted steel, stainless steel, and galvanized steel. Optional primed colors also include Brilliant White, Gold Sand, and Jet Black.

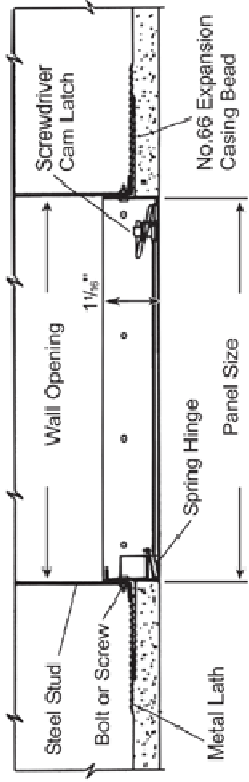


Standard Sizes and Model Numbers				
Door	Opening	Model	Hinges	Locks Shipping

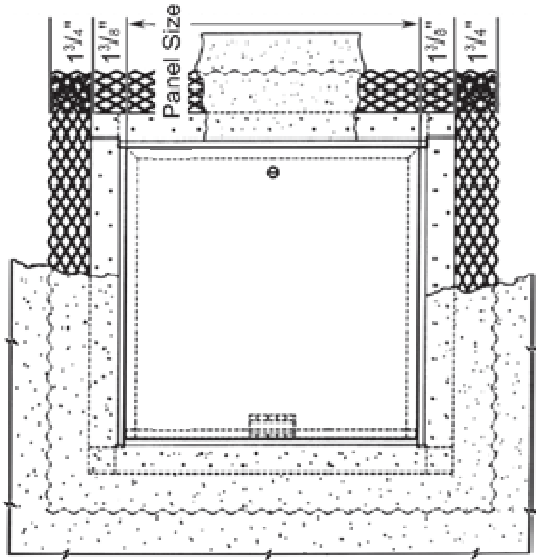
[Specification](#)
[Cut Sheet](#)
[Submittal Drawing](#)

8" x 12"	8-1/4" x 12-1/4"	3200-012	1	1	6
12" x 12"	12-1/4" x 12-1/4"	3200-014	1	1	7
12" x 16"	12-1/4" x 16-1/4"	3200-016	2	1	9
12" x 18"	12-1/4" x 18-1/4"	3200-018	2	1	10
12" x 24"	12-1/4" x 24-1/4"	3200-019	2	2	12
16" x 16"	16-1/4" x 16-1/4"	3200-020	2	1	11
16" x 20"	16-1/4" x 20-1/4"	3200-022	2	1	13
18" x 18"	18-1/4" x 18-1/4"	3200-024	2	1	12
20" x 24"	20-1/4" x 24-1/4"	3200-026	2	4**	17
20" x 30"	20-1/4" x 30-1/4"	3200-028	3	5**	21
24" x 24"	24-1/4" x 24-1/4"	3200-030	2	4**	20
24" x 30"	24-1/4" x 30-1/4"	3200-032	3	5**	24
24" x 36"	24-1/4" x 36-1/4"	3200-034	3	5**	28
* Add "K" to door size to indicate style desired					
** One cam lock center at top and bottom panel; balance on side opposite hinges					

Installation Detail - Section AA



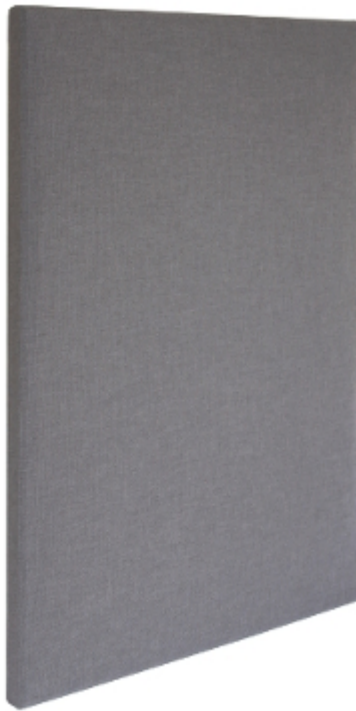
Installation Detail - Elevation



Mailing Address:

ATS Acoustics
15 W Main St Box 260
Piper City, Illinois 60959
United States

ATS Acoustic Panel - 24 x 48 x 2 - GUILFORD FABRIC - WITH IMAGE
DESIGN - 2 EACH AT BOARD ROOM



- Price and Order
- Item Description
- Q & A

Since the ancient Greeks the [golden ratio](#) has been considered a visually pleasing proportion. We agree, and designed this stock size to be proportioned according to the golden ratio, while at the same time sticking to even foot increments for ease in combining this size with our other stock sizes in patterns and layouts.

Specs and Features

- This panel is 2 inches thick. [\[?\]](#)
- Average weight per panel: 6 lbs

- Core material is Roxul AFB mineral wool, a highly effective sound absorber (NRC 1.0 out of 1). Higher NRC means fewer panels are needed to treat your space.
- Built to last with a solid wood internal frame that protects edges and corners from dents and damage.
- 1/4-inch wood back panel for easy and secure installation without glue. Wall-mounting hardware and instructions included.
- Leaves no more wall damage then hanging a picture, ideal for temporary or rented space.
- Cover fabric is 100% polyester, Guilford of Maine, fire resistant. Fabric is NFPA 701 rated, and panel is ASTM E84 Class A fire rated, at no additional charge.
- Available in a range of colors to match your style.
- Combine sizes and colors in creative patterns for a unique and visually impressive look.
- Quick easy shipping via UPS Ground.
- Furniture-quality design and workmanship. Handcrafted in the USA.

Installation

Our professional installation kit is included at no extra charge. The kit includes aluminum clips, screws, and anchors for neat and secure installation on drywall, concrete, or wood walls. [Click here for full installation instructions. \(PDF\)](#)
New! For perfect positioning and easy installation, our no-measuring installation template is now included free with all installation kits (1 per order).



Absorption Coefficients

1/3 Octave Band Center Frequencies, Hz						
125	250	500	1000	2000	4000	NRC
0.18	0.63	1.10	1.11	1.13	1.10	1.00
Data from independent testing of this item by RAL, a leading acoustical laboratory.						

We think acoustic panels should do as much for the look of your room as they do for the sound. Choose from any of the colors shown here to create a great look for your space. If you have a special fabric choice or color request, we can also source custom colors and custom fabrics for you. Just give us a call toll-free at 1-866-787-7881.

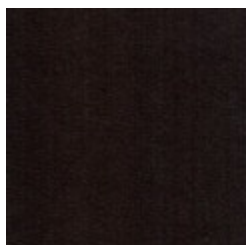
Although some color variation between monitors will occur, these images have been carefully captured to ensure the colors are true-to-life representatives. Please note that our Original fabric is manufactured with natural fibers. Therefore, while every effort is made to ensure color consistency, each Original fabric color is subject to shade variations between dye lots. To maintain colors without fading, avoid installation in areas that receive direct sunlight.

If you prefer, you can [order fabric swatches here](#). Please contact one of our Inside Sales Engineers if you are looking to color match a previously obtained sample or product order.

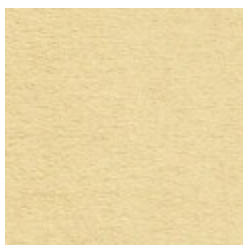
* Indicates low availability of this fabric color due to a supplier backorder. Please call to check stock on these colors before ordering.

Color Notification The ATS Guilford of Maine color Warm Brown has been renamed to Latte.

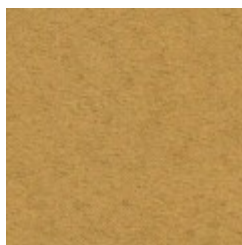
Microsuede Fabric - Stock Colors



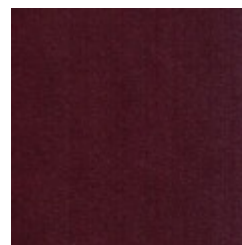
Black Microsuede



Shell Microsuede

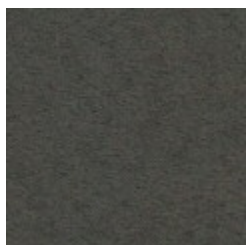


Camel Microsuede

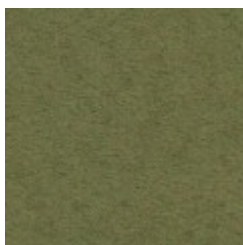


Wine Microsuede

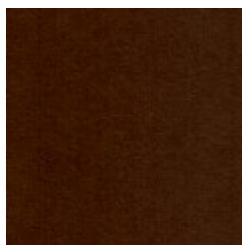
Microsuede Fabric - Custom Colors



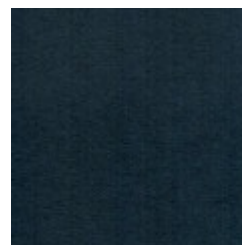
Mercury Microsuede



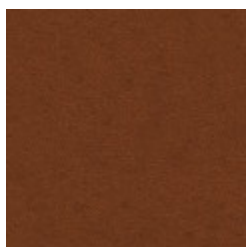
Sage Microsuede



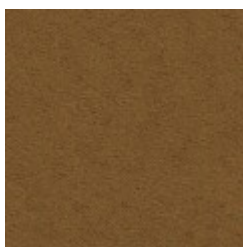
Chocolate Microsuede



Navy Microsuede



Terracotta Microsuede



Peat Microsuede

Original Fabric - Stock Colors



Black



Ivory



Natural



Burgundy

Original Fabric - Custom Colors



Alabaster-Limited Edition



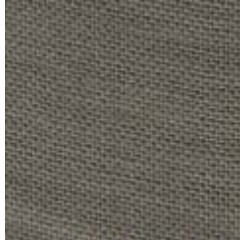
Parchment



Celery



Smoke



Gray



Tomato



Espresso



Mocha-Out of Stock



Wedgewood

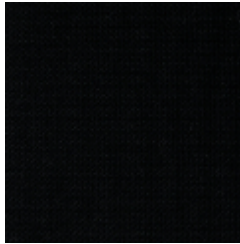


Royal

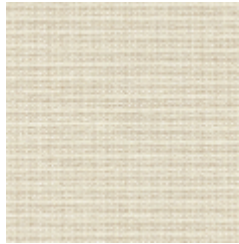


Nugget

Guilford of Maine - Stock Colors



Onyx



Linen



Tan



Claret

Guilford of Maine - Custom Colors



Cream



Pale Green



Light Blue



Brown



You can choose to send us (via email attachment or file upload) an image file you already have, or you can select from millions of stunning images available for purchase on stock photography web sites.

Try [istockphoto.com](https://www.istockphoto.com), [bigstockphoto.com](https://www.bigstockphoto.com), or [123rf.com](https://www.123rf.com).

Here are a few popular ideas for your Art Acoustic Panel.

- Build your home theater with your favorite movie poster images
- Outfit your recording studio with vintage guitar prints
- Update your living room with a classy abstract art piece
- Hang portraits, wedding shots, or candid family shots
- Anything you can imagine!

Size: In order to get a quality print at a large enough size for your art panel, the image must be big enough (in pixels). An absolute minimum of 2000 pixels wide is recommended. More specifically, multiply the length (or width) of your panel by 67 to get the minimum length (or width) of your image in pixels. Above the minimum, the bigger the better.

Margin: The image must not have critical content close to the edge. The fabric, once printed, will be wrapped around the panel. Some of the image will end up on the sides of the panel, not the front. This is probably not a good place for someone's face!

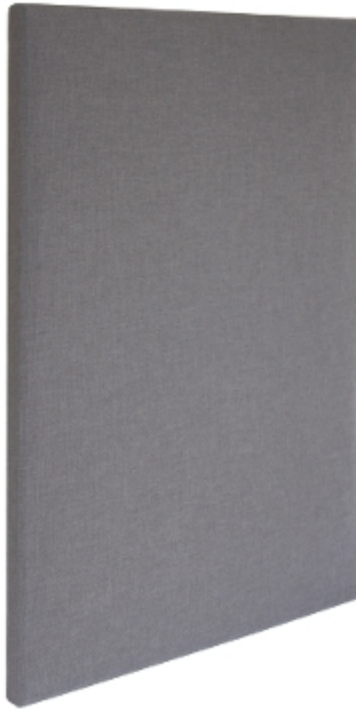
Uploading Your Photos: Once you have placed your order and received your order number, please go to [Track Your Order](#). Using your order number and email address, you can bring up your order's summary. A link will be available above your order summary where you can begin uploading your art images. The preferred file format is JPG, though others are accepted. File size is limited to 20 MB per file, and only 25 files may be uploaded per order.

BROWNSVILLE NAVIGATION DISTRICT
OF CAMERON COUNTY, TEXAS

PORT OF 
BROWNSVILLE
• WORLD CLASS •

[Home](#) > [ATS Acoustic Panels with Guilford of Maine Fabric](#)

ATS Acoustic Panel - 24 x 48 x 2 - 8 EACH AT BOARD ROOM



- [Price and Order](#)
- [Item Description](#)
- [Q & A](#)

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- Cover fabric is 100% polyester, Guilford of Maine, fire resistant. Fabric is NFPA 701 rated, and panel is ASTM E84 Class A fire rated, at no additional charge.
- Available in a range of colors to match your style.
- Combine sizes and colors in creative patterns for a unique and visually impressive look.
- Quick easy shipping via UPS Ground.
- Furniture-quality design and workmanship. Handcrafted in the USA.

Installation

Our professional installation kit is included at no extra charge. The kit includes aluminum clips, screws, and anchors for neat and secure installation on drywall, concrete, or wood walls. [Click here for full installation instructions. \(PDF\)](#)
New! For perfect positioning and easy installation, our no-measuring installation template is now included free with all installation kits (1 per order).



Absorption Coefficients

1/3 Octave Band Center Frequencies, Hz						
125	250	500	1000	2000	4000	NRC
0.18	0.63	1.10	1.11	1.13	1.10	1.00
Data from independent testing of this item by RAL, a leading acoustical laboratory.						

“ The panels even got good compliments on looks from my wife, who is a tough critic on room decor.
 ”

- George from St Thomas, Virgin Islands

Product and System Specifications DuPont™ Tyvek® CommercialWrap®

SECTION 07 25 00 WEATHER BARRIERS DuPont™ Tyvek® CommercialWrap®

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Weather barrier membrane (DuPont™ Tyvek® CommercialWrap®)
- B. Seam Tape (DuPont™ Tyvek® Tape)
- C. Flashing (DuPont™ FlexWrap™, DuPont™ FlexWrap™ NF, DuPont™ StraightFlash™, DuPont™ StraightFlash™ VF, and/or DuPont™ Thru-Wall Flashing)
- D. Fasteners (DuPont™ Tyvek® Wrap Caps)

1.2 REFERENCES

- A. ASTM International
 - 1. ASTM C920; Standard Specification for Elastomeric Joint Sealants
 - 2. ASTM C1193; Standard Guide for Use of Joint Sealants
 - 3. ASTM D882; Test Method for Tensile Properties of Thin Plastic Sheeting
 - 4. ASTM D1117; Standard Guide for Evaluating Non-woven Fabrics
 - 5. ASTM E84; Test Method for Surface Burning Characteristics of Building Materials
 - 6. ASTM E96; Test Method for Water Vapor Transmission of Materials
 - 7. ASTM E1677; Specification for Air Retarder Material or System for Framed Building Walls
 - 8. ASTM E2178; Test Method for Air Permeance of Building Materials
 - 9. ASTM E2357; Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
- B. AATCC – American Association of Textile Chemists and Colorists
 - 1. Test Method 127 Water Resistance: Hydrostatic Pressure Test
- C. TAPPI
 - 1. Test Method T-410; Grams of Paper and Paperboard (Weight per Unit Area)
 - 2. Test Method T-460; Air Resistance (Gurley Hill Method)

1.3 SUBMITTALS

- A. Refer to Section [01 33 00 Submittal Procedures] [insert section number and title].
- B. Product Data: Submit manufacturer current technical literature for each component.
- C. Samples: Weather Barrier Membrane, minimum 8-1/2 inches by 11 inch.

BND ADMINISTRATION COMPLEX

07 25 00

Weather Barriers
DuPont™ Tyvek® CommercialWrap®

D. Quality Assurance Submittals

1. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with indicated requirements.
2. Manufacturer Instructions: Provide manufacturer's written installation instructions.
3. Manufacturer's Field Service Reports: Provide site reports from authorized field service representative, indicating observation of weather barrier assembly installation.

E. Closeout Submittals

1. Refer to Section [01 78 00 Closeout Submittals] [insert section number and title].
2. Weather Barrier Warranty: Manufacturer's executed warranty form with authorized signatures and endorsements indicating date of Substantial Completion.

1.4 QUALITY ASSURANCE

A. Qualifications

1. Installer shall have experience with installation of commercial weather barrier assemblies under similar conditions.
2. Installation shall be in accordance with weather barrier manufacturer's installation guidelines and recommendations.
3. Source Limitations: Provide commercial weather barrier and accessory materials produced by single manufacturer.

B. Mock-up

1. Install mock-up using approved weather barrier assembly including fasteners, flashing, tape and related accessories per manufacturer's current printed instructions and recommendations.
 - a. Mock-up size: [10 feet by 10 feet] [insert size].
 - b. Mock-up Substrate: Match wall assembly construction, including window opening.
 - c. Mock-up may [not] remain as part of the work.
2. Contact manufacturer's designated representative prior to weather barrier assembly installation, to perform required mock-up visual inspection and analysis as required for warranty.

C. Pre-installation Meeting

1. Refer to Section [01 31 19 Project Meetings] [insert section number and title].
2. Hold a pre-installation conference, two weeks prior to start of weather barrier installation. Attendees shall include Contractor, Architect, Engineer, Installer, Owner's Representative, and Weather Barrier Manufacturer's Designated Representative.
3. Review all related project requirements and submittals, status of substrate work and preparation, areas of potential conflict and interface, availability of weather barrier assembly materials and components, installer's training requirements, equipment, facilities and scaffolding, and coordinate methods, procedures and sequencing requirements for full and proper installation, integration and protection.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section [01 60 00 Product Requirements] [insert section number and title].

- B. Deliver weather barrier materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store weather barrier materials as recommended by weather barrier manufacturer.

1.6 SCHEDULING

- A. Review requirements for sequencing of installation of weather barrier assembly with installation of windows, doors, louvers and flashings to provide a weather-tight barrier assembly.
- B. Schedule installation of weather barrier materials and exterior cladding within nine months of weather barrier assembly installation.

1.7 WARRANTY

- A. Refer to Section [01 78 36 Warranties] [insert section number and title].
- B. Special Warranty
 - 1. Special weather-barrier manufacturer's warranty for weather barrier for a period of ten (10) years from date of purchase.
 - 2. Pre-installation meetings and jobsite observations by weather barrier manufacturer for warranty are required.
 - 3. Warranty Areas: [Describe specific areas of work protected and areas of work excluded as required by project conditions].

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. DuPont; 4417 Lancaster Pike, Chestnut Run Plaza 728, Wilmington, DE 19805; 1-800-44-TYVEK (8-9835); <http://www.construction.tyvek.com>

2.2 MATERIALS

- A. Basis of Design: spunbonded polyolefin, non-woven, non-perforated, weather barrier is based upon DuPont™ Tyvek® CommercialWrap® and related assembly components.
- B. Performance Characteristics:
 - 1. Air Penetration: 0.001 cfm/ft² at 75 Pa, when tested in accordance with ASTM E2178. Type I per ASTM E1677. ≤0.04 cfm/ft² at 75 Pa, when tested in accordance with ASTM E2357
 - 2. Water Vapor Transmission: 28 perms, when tested in accordance with ASTM E96, Method B.
 - 3. Water Penetration Resistance: 280 cm when tested in accordance with AATCC Test Method 127.
 - 4. Basis Weight: 2.7 oz/yd², when tested in accordance with TAPPI Test Method T-410.
 - 5. Air Resistance: Air infiltration at >1500 seconds, when tested in accordance with TAPPI Test

Method T-460.

6. Tensile Strength: 38/35 lbs/in., when tested in accordance with ASTM D882, Method A.
7. Tear Resistance: 12/10 lbs., when tested in accordance with ASTM D1117.
8. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E 84. Flame Spread: 10, Smoke Developed: 10.

2.3 ACCESSORIES

A. Seam Tape: 3 inch wide, DuPont™ Tyvek® Tape for commercial applications.

B. Fasteners:

1. DuPont™ Tyvek® Wrap Cap Screws, as distributed by DuPont: 1-5/8 inch rust resistant screw with 2-inch diameter plastic cap or manufacturer approved 1-1/4" or 2" metal gasketed washer

AND/OR

2. Tyvek® Wrap Caps, as distributed by DuPont: #4 nails with large 1-inch plastic cap fasteners, or 1-inch plastic cap staples with leg length sufficient to achieve a minimum penetration of 5/8-inch into the wood stud.

AND/OR

3. Masonry tap-con fasteners with Tyvek® Wrap Caps as distributed by DuPont: 2-inch diameter plastic cap fasteners.

C. Sealants

1. Refer to Section [07 92 00 Joint Sealants] [insert section number and title].

OR

2. Provide sealants that comply with ASTM C920, elastomeric polymer sealant to maintain watertight conditions.
3. Products:
 - a. DuPont™ Commercial Sealant
 - c. DuPont™ Residential Sealant
 - b. Sealants recommended by the weather barrier manufacturer.

D. Adhesives:

1. Provide adhesive recommended by weather barrier manufacturer.
2. Products:
 - a. Liquid Nails® LN-109
 - b. Denso Butyl Liquid
 - c. 3M High Strength 90
 - d. SIA 655
 - e. Adhesives recommend by the weather barrier manufacturer.

E. Primers:

1. Provide flashing manufacturer recommended primer to assist in adhesion between substrate and flashing.
2. Products:
 - a. 3M High Strength 90
 - b. Denso Butyl Spray
 - c. SIA 655
 - d. Permagrip 105
 - e. ITW TACC Sta' Put SPH
 - f. Primers recommended by the flashing manufacturer

F. Flashing

1. DuPont™ FlexWrap™, as distributed by DuPont: flexible membrane flashing materials for window openings and penetrations.
2. DuPont™ FlexWrap™ NF, as distributed by DuPont: flexible membrane flashing materials for window openings and penetrations.
3. DuPont™ StraightFlash™, as distributed by DuPont: straight flashing membrane materials for flashing windows and doors and sealing penetrations such as masonry ties, etc.
4. DuPont™ StraightFlash™ VF, as distributed by DuPont: dual-sided straight flashing membrane materials for brick mold and non-flanged windows and doors.
5. DuPont™ Thru-Wall Surface Adhered Membrane with Integrated Drip Edge: Thru-Wall flashing membrane materials for flashing at changes in direction or elevation (shelf angles, foundations, etc.) and at transitions between different assembly materials.
6. Preformed Inside and Outside Corners and End Dams as distributed by DuPont: Preformed three-dimensional shapes to complete the flashing system used in conjunction with DuPont™ Thru-Wall Flashing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify substrate and surface conditions are in accordance with weather barrier manufacturer recommended tolerances prior to installation of weather barrier and accessories.

3.2 INSTALLATION – WEATHER BARRIER

- A. Install weather barrier over exterior face of exterior wall substrate in accordance with manufacturer recommendations.
- B. Install weather barrier prior to installation of windows and doors.
- C. Start weather barrier installation at a building corner, leaving 6-12 inches of weather barrier extended beyond corner to overlap.
- D. Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers. Maintain weather barrier plumb and level.

- E. Sill Plate Interface: Extend lower edge of weather barrier over sill plate interface 3-6 inches. Secure to foundation with elastomeric sealant as recommended by weather barrier manufacturer.
- F. Window and Door Openings: Extend weather barrier completely over openings.
- G. Overlap weather barrier
 - 1. Exterior corners: minimum 12 inches.
 - 2. Seams: minimum 6 inches.
- H. Weather Barrier Attachment:
 - 1. Attach weather barrier to studs through exterior sheathing. Secure using weather barrier manufacturer recommended fasteners, space 12 -18 inches vertically on center along stud line, and 24 inch on center, maximum horizontally.
 - 2. Attach weather barrier to masonry. Secure using weather barrier manufacturer recommended fasteners, spaced 12-18 inches vertically on center and 24 inches maximum horizontally. Weather barrier may be temporarily attached to masonry using recommended adhesive, placed in vertical strips spaced 24 inches on center, when coordinated on the project site.
- I. Apply 4 inch by 7 inch piece of DuPont™ StraightFlash™ or weather barrier manufacturer approved alternate to weather barrier membrane prior to the installation cladding anchors.

3.3 SEAMING

- A. Seal seams of weather barrier with seam tape at all vertical and horizontal overlapping seams.
- B. Seal any tears or cuts as recommended by weather barrier manufacturer.

3.4 OPENING PREPARATION (for use with non-flanged windows – all cladding types)

- A. Flush cut weather barrier at edge of sheathing around full perimeter of opening.
- B. Cut a head flap at 45-degree angle in the weather barrier at window head to expose 8 inches of sheathing. Temporarily secure weather barrier flap away from sheathing with tape.

3.5 FLASHING (for use with non-flanged windows – all cladding types)

- A. Cut 9-inch wide DuPont™ FlexWrap™ or DuPont™ FlexWrap™ NF a minimum of 12 inches longer than width of sill rough opening. Apply primer as required by manufacturer.
- B. Cover horizontal sill by aligning DuPont™ FlexWrap™ edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.
- C. Fan DuPont™ FlexWrap™ at bottom corners onto face of wall. Firmly press in place. Mechanically fasten fanned edges. Mechanical fastening is not required for DuPont™ FlexWrap™ NF.
- D. Apply 9-inch wide strips of DuPont™ StraightFlash™ at jambs. Align flashing with interior edge of jamb framing. Start DuPont™ StraightFlash™ at head of opening and lap sill flashing down to the sill.
- E. Spray-apply primer to top 6 inches of jambs and exposed sheathing.
- F. Install DuPont™ FlexWrap™ DuPont™ FlexWrap™ NF at opening head using same installation procedures used at sill. Overlap jamb flashing a minimum of 2 inches.
- G. Coordinate flashing with window installation.

- H. On exterior, install backer-rod in joint between window frame and flashed rough framing. Apply sealant at jambs and head, leaving sill unsealed. Apply sealants in accordance with sealant manufacturer's instructions and ASTM C 1193.
- I. Position weather barrier head flap across head flashing. Adhere using 4-inch wide DuPont™ StraightFlash™ over the 45-degree seams.
- J. Tape top of window in accordance with manufacturer recommendations.
- K. On interior, install backer rod in joint between frame of window and flashed rough framing. Apply sealant around entire window to create air seal. Apply sealant in accordance with sealant manufacturer's instructions and ASTM C 1193.

3.8 THRU-WALL FLASHING INSTALLATION

- A. Apply primer per manufacturer's written instructions.
- B. Install preformed corners and end dams bedded in sealant in appropriate locations along wall.
- C. Starting at a corner, remove release sheet and apply membrane to primed surfaces in lengths of 8 to 10 feet.
- D. Extend membrane through wall and leave ¼ inch minimum exposed to form drip edge.
- E. Roll flashing into place. Ensure continuous and direct contact with substrate.
- F. Lap ends and overlap preformed corners 4 inches minimum. Seal all laps with sealant.
- G. Trim exterior edge of membrane 1-inch and secure metal drip edge per manufacturer's written instructions.
- H. Terminate membrane on vertical wall. [Terminate into reglet, counterflashing or with termination bar.]
- I. Apply sealant bead at each termination.

3.9 THRU-WALL FLASHING / WEATHER BARRIER INTERFACE AT BASE OF WALL

- A. Overlap thru-wall flashing with weather barrier by 6-inches.
- B. Mechanically fasten bottom of weather barrier through top of thru-wall flashing.
- C. Seal vertical and horizontal seams with tape or sealing membrane.

3.10 THRU-WALL FLASHING / WEATHER BARRIER INTERFACE AT SHELF ANGLE

- A. Seal weather barrier to bottom of shelf angle with sealing membrane.
- B. Apply thru-wall flashing to top of shelf angle. Overlap thru-wall flashing with weather barrier by 6-inches.
- C. Seal bottom of weather barrier to thru-wall flashing with tape or sealing membrane.

3.11 THRU-WALL FLASHING / WEATHER BARRIER INTERFACE AT WINDOW HEAD

- A. Cut flap in weather barrier at window head.
- B. Prime exposed sheathing.

- C. Install lintel as required. Verify end dams extend 4 inches minimum beyond opening.
- D. Install end dams bedded in sealant.
- E. Adhere 2 inches minimum thru-wall flashing to wall sheathing. Overlap lintel with thru-wall flashing and extend ¼ inch minimum beyond outside edge of lintel to form drip edge.
- F. Apply sealant along thru-wall flashing edges.
- G. Fold weather barrier flap back into place and tape bottom edge to thru-wall flashing.
- H. Tape diagonal cuts of weather barrier.
- I. Secure weather barrier flap with fasteners.

3.12 FIELD QUALITY CONTROL

- A. Notify manufacturer's designated representative to obtain [required] periodic observations of weather barrier assembly installation.

3.14 PROTECTION

- A. Protect installed weather barrier from damage.

END OF SECTION

FLUID-APPLIED WEATHER BARRIERS
DuPont™ Tyvek® Fluid Applied WB System

PART 1 - GENERAL

1.1 SECTION INCLUDES

(

- A. Fluid-applied, vapor permeable weather barrier membrane.**
- B. Joint Tape.**
- C. Flashing:**
 - 1. Vapor Permeable Elastomeric Flashing.**
 - 2. Flexible Flashing.(DuPont™ FlexWrap™NF)**
 - 3. Sheet Flashing. (DuPont™ StraightFlash™)**
 - 4. Thru Wall Flashing. Hyload™**
- D. Joint Compound. (DuPont™ Tyvek® Fluid Applied Flashing and Joint Compound, trowel grade)**
- E. Sealant. (DuPont™ Sealant for Tyvek® Fluid Applied Systems)**
- F. Primers for flexible flashing and sheet flashing.**

1.2 REFERENCES

- A. ASTM International**
 - 1. ASTM C 1250 – Standard Test Method for Nonvolatile Content of Cold Liquid-Applied Elastomeric Waterproofing Membranes.**
 - 2. ASTM D 412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension.**
 - 3. ASTM D 2240 – Standard Test Method for Rubber Property – Durometer Hardness.**
 - 4. ASTM D 4541 – Standard Test Method for Pull-off Strength of Coatings Using Portable Adhesion Testers.**
 - 5. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.**
 - 6. ASTM E 96 - Test Method for Water Vapor Transmission of Materials**
 - 7. ASTM E 283 – Standard Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences Across the Specimen.**
 - 8. ASTM E 331 – Standard Test Method for Water Penetration of Exterior Windows, Skylight, Doors and Curtain Walls by Uniform Static Air Pressure Differences.**

9. **ASTM E 779 – Standard Test Method for Determining Air Leakage Rate by Fan Pressurization.**
10. **ASTM E 783 – Standard Test Method for Field Measurement of Air Leakage through Installed Exterior Windows and Doors.**
11. **ASTM E 1105 – Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.**
12. **ASTM E 1186 – Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems.**
13. **ASTM E 1677 - Specification for Air Retarder Material or System for Framed Building Walls.**
14. **ASTM E 2178 – Standard Test Method for Air Permeance of Building Materials**
15. **ASTM E 2357 – Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.**
16. **ASTM G155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.**

B. AATCC – American Association of Textile Chemists & Colorists

1. **Test Method 127 Water Resistance: Hydrostatic Pressure Test.**

C. TAPPI

1. **Test Method T-460; Air Resistance of Paper (Gurley Hill Method).**

1.3 SUBMITTALS

A. Refer to Boiler Plate Section

B. Product Data: Submit manufacturer's current technical literature for each component.

C. Quality Assurance Submittals:

1. **Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with indicated requirements.**
2. **Manufacturer Instructions: Provide manufacturer's written installation instructions.**
3. **Manufacturer's Field Service Reports: Provide site reports from authorized field service representative, indicating observation of weather barrier system installation.**

D. Closeout Submittals:

1. **Refer to Boiler Plate Section**
2. **Weather Barrier Warranty: Manufacturer's executed warranty form with authorized signatures and endorsements indicating date of Substantial Completion.**

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Installer shall have experience with installation of commercial fluid-applied weather barrier assemblies under similar conditions.
 2. Installer shall be trained and certified for installation by manufacturer.
- B. Installation shall be in accordance with manufacturer's installation guidelines and recommendations.
- C. Source Limitations: Provide weather barrier and accessory materials produced by single manufacturer.
- D. Mock-up:
1. Install mock-up using approved weather barrier system including membrane, flashing, joint and detailing compound and related weather barrier accessories according to weather barrier manufacturer's current printed instructions and recommendations.
 - a. Mock-up size: [10 feet by 10 feet] [insert size].
 - b. Mock-up Substrate: Match wall assembly construction, including window opening.
 - c. Mock-up may [not] remain as part of the work.
 2. Contact manufacturer's designated representative prior to weather barrier system installation, to perform required mock-up visual inspection and analysis as required for warranty.
- E. Pre-installation Meeting
1. Refer to Boiler Plate Section
 2. Hold a pre-installation conference, two weeks prior to start of weather barrier installation. Attendees shall include Contractor, Architect, certified installer, Owner's Representative, and weather barrier manufacturer's designated field representative.
 3. Review all related project requirements and submittals, status of substrate work and preparation, areas of potential conflict and interface, availability of weather barrier system materials and components, installer's training requirements, equipment, facilities and scaffolding, and coordinate methods, procedures and sequencing requirements for full and proper installation, integration and protection.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Refer to Boiler Plate Section
- B. Deliver weather barrier materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store weather barrier materials as recommended by manufacturer.

1.6 SCHEDULING

- A. Review requirements for sequencing of installation of weather barrier system with installation of windows, doors, louvers and flashings to provide a weather-tight barrier system.**
- B. Schedule installation of exterior cladding within nine months of weather barrier system installation.**

1.7 WARRANTY

A. Limited Warranty

- 1. Manufacturer's warranty for weather barrier for a period of ten (10) years from date of Purchase.**
- 2. Pre-installation meeting and jobsite observations by weather barrier manufacturer for warranty are required.**
- 3. Warranty Areas: All**

PART 2 - PRODUCTS

2.1 WEATHER BARRIER

Manufacturer: DuPont Building Innovations; 4417 Lancaster Pike, Chestnut Run Plaza 728, Wilmington, DE 19805; 1.800.44TYVEK (8-9835); <http://weatherization.tyvek.com>

Distributor: Weatherization Partners, LTD, (WPL)

Tyvek Senior Certified Specialist: Harry J. Armenia 361-230-1002

- 1. Description: A single-component, low VOC, 25 mil thick synthetic polymer fluid-applied product with superior elasticity and flexibility providing resistance to air flow, bulk water and wind driven rain yet allows moisture vapor to escape.**
- 2. Basis of Design: DuPont™ Tyvek® Fluid Applied WB System; including DuPont™ Tyvek® Fluid Applied WB, DuPont™ Tyvek® Fluid Applied Flashing and Joint Compound, DuPont™ Tyvek® Fluid Applied Flashing – Brush Grade and DuPont™ Sealant for Tyvek® Fluid Applied Systems.**

B. Performance Characteristics:

- 1. Air Penetration: 0.0002 cfm/ft² at 75 Pa, when tested in accordance with ASTM E 2178. Type I per ASTM E 1677 and ≤ 0.01 cfm/ft² at 75 Pa, when tested in accordance with ASTM E 2357.**
- 2. Water Vapor Transmission: 25 perms, when tested in accordance with ASTM E 96, Method B at 25 mils DFT (Dry Film Thickness).**
- 3. Water Penetration Resistance: Greater than 1000 cm when tested in accordance with AATCC Test Method 127. No leakage at 15 psf when tested in accordance with ASTM E 331.**

4. **Air Resistance:** Air infiltration greater than 10,000 seconds per 100cc, when tested in accordance with TAPPI Test Method T-460.
5. **Tensile Strength:** Minimum 169 lbs/in², when tested in accordance with ASTM D 412.
6. **Estimated Elongation:** 420% in accordance with ASTM D 412.
7. **Hardness:** Passes at a Shore A hardness of 71, when tested in accordance with ASTM D 2240.
8. **Surface Burning Characteristics:** Class A, when tested in accordance with ASTM E 84. **Flame Spread:** 25, **Smoke Developed:** 25.
9. **Accelerated Weathering:** 9 month exposure of membrane to ultraviolet light (UV) in accordance with ASTM G 155.
10. **Volatile Organic Content (VOC):** Less than 2% when measured in accordance with ASTM C 1250.
11. **Adhesion Strength (Concrete):** Greater than 33 psi when measured in accordance with ASTM D 4541.

2.2 ACCESSORIES

- A. **Joint Tape:** Self-adhered fiberglass mesh tape as recommended by weather barrier manufacturer.
- B. **Flashing:**
 1. **Vapor permeable elastomeric flashing:**
 - a. **Product:** [DuPont™ Tyvek® Fluid Applied Flashing and Joint Compound] or [DuPont™ Tyvek® Fluid Applied Flashing – Brush Grade, as manufactured by DuPont™].

AND/OR

2. **Flexible flashing with butyl adhesive layer.**
 - a. **Product:** DuPont™ FlexWrap™ NF.
3. **Sheet flashing with butyl adhesive layer.**
 - a. **Product:** DuPont™ StraightFlash™.
4. **Thru-wall flashing, with butyl adhesive layer.**
 - a. **Product:** Hyload™ ThruWall flashing, cloaks, and accessories.
- C. **Joint Compound:** Fluid-applied, vapor permeable, elastomeric flashing material; trowel applied.
 1. **Product:** DuPont™ Tyvek® Fluid Applied Flashing and Joint Compound.
- D. **Sealant:** Elastomeric; non-vapor permeable sealant; compatible with weather barrier.
 1. **Product:** DuPont™ Sealant for Tyvek® Fluid Applied Systems.
- E. **Primers for flexible flashing and sheet flashing:**

1. Provide flashing manufacturer recommended primer to assist in adhesion between substrate and flashing.
2. Products:
 - a. DuPont™ Adhesive/Primer
 - b. Hyload Hyprime Primer
 - c. SIA 655
 - d. Permagrip 105
 - e. ITW TACC Sta' Put SPH

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify substrate and surface conditions are in accordance with weather barrier manufacturer recommended tolerances prior to installation of weather barrier and accessories.

3.2 PREPARATION

- A. Complete surface preparation, priming, flashing and detailing of openings, cracks, and material transitions prior to beginning installation of fluid-applied weather barrier system.
- B. Surfaces shall be clean and free of frost, oil, grease, mold and efflorescence prior to application of fluid-applied weather barrier system.

3.3 INSTALLATION - DETAILING

- A. Corners: Apply joint compound, 25 mil thick, to outside and inside corners. Joint compound shall extend 2 inches from corner for full height of corner] or [Apply primer to outside and inside corners, extend 2 inches on each side of corner. Center sheet flashing over corner and press firmly in place per manufacturer's recommendations. Apply ½ inch fillet bead of joint compound applied to full-height of inside corners.
- B. Joint treatment:
 1. Sheathing:
 - a. Joints shall be prepared per manufacturer's approved joint treatment details.
 - b. Apply joint tape as recommended by fluid-applied weather barrier manufacturer.
 - 1) No joint treatment required for joints up to 1/16 inch.

- 2) Joints 1/16 to 1/4 inch: Joint compound applied to form a 1 inch width on each side of sheathing joint; smooth joint compound across sheathing joint. Thickness shall be 15 to 25 mils.
- 3) Joints 1/16 to 1/2 inch: Apply joint tape to bridge both sides of joint equally. Apply joint compound and trowel smooth embedding joint compound uniformly into joint tape to form a 1 inch width on each side of sheathing joint at a consistent thickness of 15 to 25 mils.
- 4) Joints 1/2 to 1 inch: Apply sheet flashing primer above and below sheathing joint. Center sheet flashing over sheathing joint and press firmly in place per manufacturer's recommendations.

2. Non-movement joints in masonry and transitions to columns and beams:

- a. Joints 1/4 inch wide or less: Apply joint compound a minimum of 2 inches wide by 60 mils thick to each side of joint or crack.
- b. Joints 1/4 to 1/2 inch: Apply joint tape to joint, then apply joint compound to joint 2 inches wide by 60 mils thick.] or [Apply primer 2 inches on each side of joint. Center sheet flashing over joint and press firmly in place per manufacturer's recommendations.

C. Apply joint compound to cladding anchors prior to installation of weather barrier membrane per manufacturer's instructions.

D. Apply joint compound around penetrations in exterior walls forming a fillet bead minimum ½ inch onto each surface.

E. Installation – Vapor permeable elastomeric flashing at openings:

1. At jambs and head of rough opening: Apply 25 mil thickness of flashing to full depth of opening and 2 inches outside face of opening.
2. At sills: Apply primer to substrates as recommended by manufacturer. Cut sheet flashing to fit directly between jambs of opening. Install sheet flashing to full width of sill opening and down onto outside face of opening a minimum of 6 inches. Cover sheet flashing with 25 mil thickness of vapor permeable elastomeric flashing per fluid-applied weather barrier manufacturer's instructions.

OR

F. Installation – Flexible flashing at openings:

1. Prime substrates as recommended by self-adhered sheet membrane flashing manufacturer. Cut sheet membrane flashing a minimum of 12 inches longer than length of sill rough opening.
2. Cover horizontal sill by aligning sheet membrane edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure sheet membrane tightly into corners by working in along the sill before adhering up the jambs.
3. Fan sheet membrane at bottom corners onto face of wall. Firmly press in place.

4. Apply 9-inch wide strips of sheet membrane at jambs. Align sheet membrane with interior edge of jamb framing. Start sheet membrane at head of opening and lap sheet membrane at sill.
 5. Install sheet membrane at opening head using same installation procedures used at sill. Overlap jamb flashing a minimum of 2 inches.
 6. Coordinate flashing with fluid-applied weather barrier and window installation.
- G. Allow Flashing, Joint Compound and Sealant to cure for minimum 24 hours before coating with Fluid-applied Weather Barrier.

3.4 INSTALLATION - FLUID-APPLIED WEATHER BARRIER

- A. Install fluid-applied weather barrier prior to installation of windows, doors, and louvers.
- B. Mask and protect any adjacent finished surfaces from fluid-applied weather barrier material.
- C. Install fluid-applied weather barrier over exterior face of required exterior wall substrates in accordance with weather barrier manufacturer recommendations and instructions.
- D. Install fluid-applied weather barrier by pressure-rolling method or spray and backrolling method to achieve 25 mils providing a consistent and uniform thickness.
- E. Repair any voids, holidays, or non-uniform installations or damage by other trades to proper mil thickness prior to installation of final cladding assemblies.

3.5 FIELD QUALITY CONTROL

- A. Notify weather barrier manufacturer's designated representative to obtain periodic observations of weather barrier system installation. Harry J. Armenia 361-230-1002
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections as required in Contract Documents.
- C. Inspections: Weather barrier materials, accessories, and installation are subject to inspection for compliance with performance requirements.
- D. Tests: As determined by Owner's testing agency from among the following tests:
 1. Quantitative Air-Leakage Testing: Weather barrier assemblies will be tested for air leakage according to ASTM E 783.
 2. Qualitative Air-Leakage Testing: Weather barrier assemblies will be tested for air leakage according to ASTM E 779.
 3. Qualitative Water-Leakage Testing: Weather barrier assemblies will be tested for water leakage according to ASTM E 1105.
 4. Qualitative Air-Leakage Testing: Weather barrier assemblies will be tested for evidence of air leakage according to ASTM E 1186.

- E. Weather barriers assemblies will be considered defective upon failure of inspections and specific project testing required.**
 - 1. Apply additional fluid-applied weather barrier material, in accordance with manufacturer's instructions, where inspection results indicate insufficient thickness, voids, skips, pinholes or other defects as recommended by weather barrier manufacturer.**
 - 2. Remove and replace deficient weather barrier system components for retesting as specified above.**
- F. Repair damage to weather barriers caused by destructive testing; follow manufacturer's written instructions.**

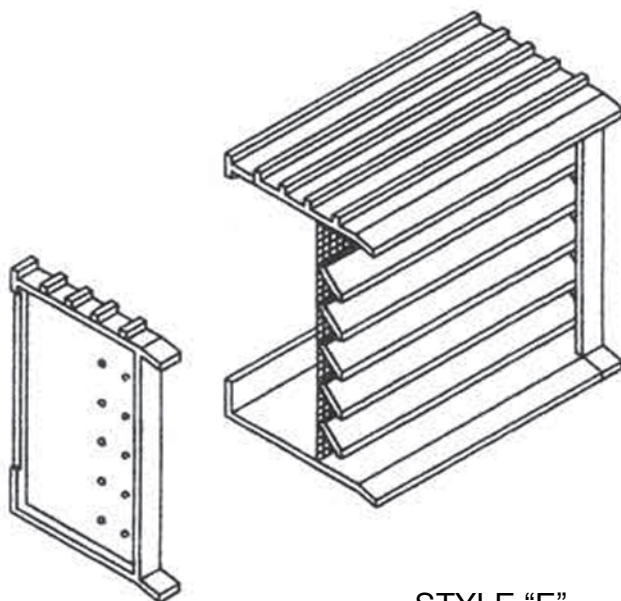
3.6 PROTECTION AND CLEANING

- A. Protect weather barrier from contact with incompatible materials and sealants not approved per weather barrier manufacturers recommendation.**
- B. Protect installed weather barrier system from damage during construction prior to cladding installation.**
 - 1. If damaged or exposed to UV beyond nine (9) months, clean and prepare surfaces and install additional, full-thickness, fluid-applied weather barrier application in accordance with weather barrier manufacturer's instructions.**
- C. Remove masking materials and adjacent protection after weather barrier installation.**

END OF SECTION

Aluminum Brick Vents

Extruded Aluminum Brick Vent - Style "E"



STYLE "E"

DRAWINGS FOR ILLUSTRATIVE PURPOSES ONLY

Style "E" Brick Vent Description:

- Extruded Aluminum, minimum .125" 6063-T5 alloy
- 4" deep
- Extruded stop for screen retention
- Overlapping blades, all at 45°, with storm lip
- Continuous weepage on bottom
- Standard 204-RI clear anodized finish (Non-standard finishes include medium or dark bronze anodized, kynar or baked enamel.)
- Special custom sizes available
- Lengths up to 8 ft. available without front mullions--continuous blade effect.

Note: Can be equipped with operable damper and ducts

Free Area Calculations: (measurements expressed in Square Feet)

		Outside Height (in inches)				
		2 3/8"	4 3/4"	7 3/4"	11 3/4"	15 3/4"
Width (in inches)	8"	.029	.080	.136	.207	.279
	12"	.044	.120	.204	.310	.418
	15 5/8"	.056	.156	.263	.400	.540
	16 1/2"	.060	.196	.280	.426	.575
	24"	.088	.271	.408	.620	.836
	32"	.117	.321	.543	.816	1.115

H&B manufactures aluminum brick vents from a minimum of 41% pre-consumer and 23% post-consumer recycled material.

Model Number (4" Deep)

Model Number (4" Deep)	W x H (Nominal)
☐ E 825	8 1/8" x 2 3/8"
☐ E 847	8 1/8" x 4 3/4"
☐ E 808	8 1/8" x 7 3/4"
☐ E 125	12" x 4 3/4"
☐ E 128	12" x 7 3/4"
☐ E 1212	12" x 11 3/4"
☐ E 157	15 5/8" x 7 3/4"
☐ E 1516	15 5/8" x 15 3/4"
☐ E 162	16 1/2" x 2 3/8"
☐ E 164	16 1/2" x 4 3/4"
☐ E 168	16 1/2" x 7 3/4"
☐ E 1616	16 1/2" x 15 3/4"
☐ E 244	24" x 4 3/4"
☐ E 248	24" x 7 3/4"
☐ E 3208	32" x 7 3/4"
☐ E 4808	48" x 7 3/4"
☐ Custom _____	

Mullions: ☐ YES ☐ NO

Note: "E" Vents add 1/4" to nominal height for ribs

Trifab® VG (VersaGlaze®)

Trifab VG 450, 451 & 451T (Thermal) Framing Systems

Design Versatility
with Unmatched
Fabrication Flexibility



Preston Pointe, Louisville, KY

Architect: Potter & Associates Architects PLLC, Louisville, KY

Glazing Contractor: Kentucky Mirror & Plate Glass Company, Louisville, KY

Trifab® VG (VersaGlaze) is built on the proven and successful Trifab platform – with all the versatility its name implies. Trifab set the standard and Trifab® VG improves upon it. There are enough fabrication, design and performance choices to please the most discerning building owner, architect and installer. Plus the confidence a tried and true framing system instills. Select from four glazing applications, four fabrication methods and multiple infill choices. Consider thermal options and performance, SSG and Weatherseal alternatives and your project takes an almost custom shape whether your architecture is traditional or modern and the building is new or retrofitted.

Aesthetics

Trifab® 450 has 1-3/4" sight lines and both Trifab® 451 and Trifab® 451T have 2" sight lines, while all three have a 4-1/2" frame depth. Designers can not only choose front, center or back glass planes, they can now add the versatility of multi-plane glass applications, thus allowing a greater range of design possibilities for specific project requirements and architectural styles. Structural Silicone Glazing (SSG) and Weatherseal options further expand the designer's choices.

Trifab® VG can be used on almost any project due to virtually seamless incorporation of Kawneer entrances, Sealair® windows or GLASSvent™ for visually frameless ventilators. These framing systems can also be packaged with Kawneer curtain walls and overhead glazing, thereby providing owner, architect and installer with proven, tested and quality products from a single source supplier.

Economy

Trifab® VG offers four fabrication choices to suit your project:

- **Screw Spline** – for economical continuous runs utilizing two piece vertical members. Provides the option to pre-assemble units with controlled shop labor costs and smaller field crews for handling and installation.
- **Shear Block** – for punched openings or continuous runs using tubular moldings. Provides the option to pre-assemble multi-lite units using shear block clips under controlled shop labor conditions. Clips provide tight joints for transporting large units. Less field time is necessary to fill large openings.
- **Stick** – for fast, easy field fabrication. Field measurements and material cuts can be done when metal is on the job.
- **Type B** – for multi-lite punched openings. Provide option for pre-assembled units for installation into single openings and controlled shop labor costs. Head and sill running through provide fewer joints and require less time to fill large openings.



Brighton Landing, Cambridge, MA
Architects: ADD Inc., Cambridge, MA
Glazing Contractors: Ipswich Bay Glass Company, Inc., Rowley, MA

Trifab® VG 450, 451 and 451T can be flush glazed from either the inside or outside. The Weatherseal option provides an alternative to the structural silicone glazed vertical mullions. This ABS/ASA rigid polymer extrusion allows complete inside glazing and creates a flush glass appearance on the building exterior, without the added labor of scaffolding or swing stages. Optional patented HP Flashing™ and HP Interlock

clip are engineered to eliminate the perimeter sill fasteners and their associated blind seals and are compatible with all glass planes.

Performance

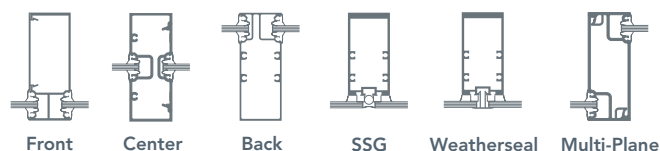
Kawneer's IsoLock™ Thermal Break option is available on Trifab® VG 451T. This process creates a composite section and prevents dry shrinkage.

U-factor, CRF values and STC ratings for Trifab® VG vary depending upon the glass plane application. Project specific U-factors can now be determined for each individual project. (See Kawneer Architectural Manual or Website for additional information)

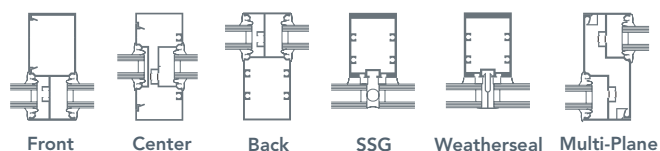
Performance Test Standards

Air Performance	ASTM E 283
Water	AAMA 501 and ASTM E 331
Structural	ASTM E 330
Thermal	AAMA 1503
Thermal Break	AAMA 505 and AAMA TIR-A8
Acoustical	AAMA 1801 and ASTM E 1425

Trifab VG 450



Trifab VG 451/451T



Finishes

Permadonic Anodized finishes are available in Class I and Class II in seven different colors.

Painted Finishes, including fluoropolymer that meet or exceed AAMA 2605, are offered in many standard choices and an unlimited number of specially-designed colors.

Solvent-free powder coatings add the "green" element with high performance, durability and scratch resistance that meet the standards of AAMA 2604.

Kawneer Company, Inc.
Technology Park / Atlanta
555 Guthridge Court
Norcross, GA 30092

kawneer.com
770 . 449 . 5555



TEXAS DEPARTMENT OF INSURANCE

Engineering Services Program / MC 103-3A 333 Guadalupe Street P.O. Box 149104 Austin, Texas 78714-9104
Phone No. (512) 322-2212 Fax No. (512) 463-6693

PRODUCT EVALUATION CWSF-34

Effective February 1, 2014

*The following product has been evaluated for compliance with the wind loads specified in the **International Residential Code (IRC)** and the **International Building Code (IBC)**. This product shall be subject to reevaluation **February 2018**.*

This product evaluation is not an endorsement of this product or a recommendation that this product be used. The Texas Department of Insurance has not authorized the use of any information contained in the product evaluation for advertising, or other commercial or promotional purpose.

This product evaluation is intended for use by those individuals who are following the design wind load criteria in Chapter 3 of the IRC and Section 1609 of the IBC. The design loads determined for the building or structure shall not exceed the design load rating specified for the products shown in the limitations section of this product evaluation. This product evaluation does not relieve a Texas licensed engineer of his responsibilities as outlined in the Texas Insurance Code, the Texas Administrative Code, and the Texas Engineering Practice Act.

Trifab 451/451T Aluminum Storefront System, Impact Resistant, manufactured by

Kawneer Company, Inc.
555 Guthridge Court
Norcross, Georgia 30092-3503
Telephone: (770) 840 - 6426

will be acceptable in designated catastrophe areas along the Texas Gulf Coast when installed in accordance with the manufacturer's installation instructions and this product evaluation.

PRODUCT DESCRIPTION

This evaluation report is for the Trifab 451/451T aluminum storefront system. The aluminum storefront system is an aluminum frame system used for commercial storefront installations.

General Description:

This evaluation report includes the following storefront assemblies:

Multiple Fixed Panel Storefront Assembly
Storefront Assembly with Double Door and Transom
Storefront Assembly with Single Door and Transom

Doors: Doors referenced in this product evaluation report are Kawneer 350 IR doors. The 350 IR doors are not part of this product evaluation report. Kawneer 350 IR doors used with these assemblies shall be listed in a separate Texas Department of Insurance product evaluation report.

Product Identification: A Kawneer label will be affixed to the storefront assembly. The label includes the manufacturer's name (Kawneer); the product name (Trifab 451/451T Storefront); that the design pressure and size are per drawing #1726T; and that the product complies with ASTM E 330, ASTM E 1886, ASTM E 1996, Large Missile Impact, Zone 4-Level D.

LIMITATIONS

Design Drawings:

Store front assemblies complying with the requirements for large missile impact shall comply and be installed in accordance with the following drawing:

Drawing No. 1726T, titled "Trifab 451/451T Large Missile Impact Storefront System," Sheets 1 thru 8 of 8, dated March 19, 2013, signed and sealed by Warren W. Schaeffer., P.E on March 20, 2013. The stated drawings will be referred to as the approved drawings in this evaluation report.

Fabrication and Assembly: Kawneer aluminum storefront systems are fabricated in the factory. The aluminum storefront systems are assembled and glazed at the jobsite. The approved drawings referenced in this evaluation report indicate the options for the glazing construction.

Design pressure (DP):

- Multiple Fixed Store Front Assemblies: Maximum design pressure: ± 45 psf. Refer to the approved drawings for specific design pressure requirements.
- Storefront Assembly with Doors and Transom: Maximum design pressure: ± 45 psf. Refer to the approved drawings for specific design pressure requirements.

Impact Resistance: These assemblies satisfy the Texas Department of Insurance's criteria for protection from windborne debris in both the **Inland I** and **Seaward** zones. These assemblies have passed an impact criteria equivalent to Missile Level D specified in ASTM E 1996-04. These assemblies may be installed at any height on the structure as long as the design pressure rating for the assembly is not exceeded. These assemblies will not need to be protected with an impact protective system when installed in areas where windborne debris protection is required.

Acceptance of Other Assemblies:

- Limitations on horizontal stacking, overall width, and the number of vertical panels used shall be as specified on the approved drawings.
- Either single doors or double doors may be used with the assemblies shown on the approved drawings.

INSTALLATION INSTRUCTIONS

General: The assembly shall be prepared and installed in accordance with the manufacturers recommended installation instructions. Detailed installation instructions and drawings are available in the following document "Installation Instructions Trifab 451/451T-IR," by Kawneer, dated August, 2010.

Installation:

Wall Framing Construction: The aluminum storefront system may be mounted to several types of wall framing construction. The types of wall framing construction allowed include:

- Concrete (minimum compressive strength: 3,000 psi)
- Wood dimension lumber (minimum Southern Yellow Pine)
- Masonry – (ASTM C-90, Grade N, Type 1 or greater)
- Steel studs (minimum 16 gauge, 33 ksi)
- Steel (1/8" thick, A36 (minimum Fy = 36 ksi))
- Aluminum (minimum 0.125" thick, 6063-T5)

Fastener Requirements:

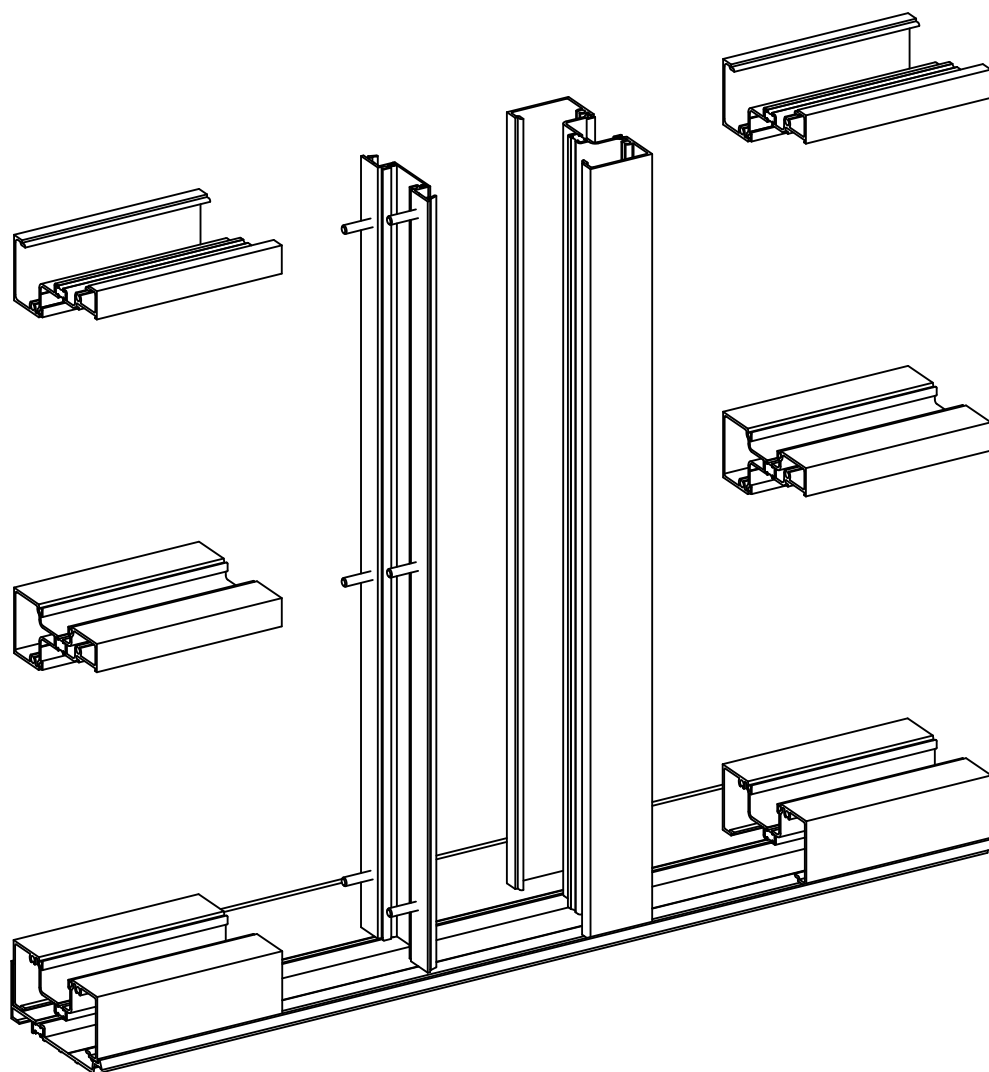
- Refer to the approved drawings for the anchor layout and notes.
- Refer to the approved drawings for the minimum embedment depths for the fasteners and the minimum edge distances (minimum distance fastener must be from the edge of the substrate material) for the fasteners.

Note: The manufacturer's installation instructions shall be available on the job site during installation. All fasteners shall be corrosion resistant as specified in the International Residential Code (IRC), the International Building Code (IBC), and the Texas Revisions.

INSTALLATION

TRIFAB® 451/451T-IR

SCREW SPLINE ASSEMBLY



INSTRUCTIONS

These instructions show the general installation sequence and procedure for typical installation.
They supplement the shop details and notations on installation and glazing.

SECTION	PAGE	
I	3-4	GENERAL NOTES
II	5	TAKEOFF GUIDE
III	6	CUT FORMULAS
IV	7, 8	PARTS IDENTIFICATION
V	9	BASIC FRAMING DETAILS
VI	10, 11	FABRICATION
VII	12-14	INSTALLATION
VIII	15, 16	GLAZING
IX	17	MISCELLANEOUS DETAILS

Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.
© Kawneer Company, Inc., 2010

HANDLING, STORING, AND PROTECTION OF ALUMINUM

The material must be protected against damage. The following precautions are recommended to assure early acceptance of your products and workmanship.

- A. HANDLE CAREFULLY** - Don't drop from the truck. Stack with adequate separation so material will not rub together. Store off the ground. Protect against elements and other construction trades. Wear hand protection to prevent injury due to sharp edges of cut extrusions.
- B. KEEP MATERIAL AWAY FROM WATER, MUD AND SPRAY** - Prevent cement, plaster, or other materials from damaging the finish.
- C. PROTECT THE MATERIALS AFTER ERECTION** - Protect by wrapping with Kraft paper or by erecting Visqueen or canvas splatter screen. Cement, plaster, terrazzo, other alkaline solutions and acid based materials used to clean masonry are very harmful to the finish and should be removed with water and mild soap IMMEDIATELY.

GENERAL INSTALLATION NOTES

The following practices are recommended for all installations:

- A. CHECK SHOP DRAWINGS, INSTALLATION INSTRUCTIONS and GLAZING INSTRUCTIONS** to become thoroughly familiar with the project. The SHOP DRAWINGS take precedence and include specific details for the project. The INSTALLATION INSTRUCTIONS are of a general nature and cover most common conditions.
- B. All materials are to be INSTALLED PLUMB, LEVEL, AND TRUE.**
- C. All work should start from bench marks and/or column lines as established by the ARCHITECTURAL DRAWINGS and the GENERAL CONTRACTOR.** Check mullion spacing from both ends of masonry opening to prevent dimensional build-up of day light opening.
- D. Make certain that construction which will receive your materials is in accordance with the contract documents.** If not, notify the GENERAL CONTRACTOR IN WRITING and resolve differences before proceeding with your work.
- E. Isolate all aluminum to be placed directly in contact with uncured masonry or incompatible materials with a heavy coat of zinc chromate or bituminous paint.**
- F. Check all materials on arrival for quantity and be sure you have everything required to begin installation.**
- G. Sealants must be compatible with all materials with which they have contact, including other sealant surfaces.** Consult with sealant manufacturer for recommendations relative to joint size, shelf life, compatibility, priming, tooling, adhesion, etc.
- H. PERIMETER FASTENING** - "Fastening" means any method of securing one part to another or to adjacent materials. These instructions specify only those fasteners used within the system. Due to varying perimeter conditions and job performance requirements, anchor fasteners are not specified in these instructions. Refer to the Shop Drawings or consult a structural engineer for fastener type, sizing, and location.
- I. CHECK OPENINGS** - Make certain that the opening which will receive your materials is in accordance with the contract documents. If not, notify the General Contractor in writing and resolve differences before proceeding with your work.
- J. BUILDING CODES** - Glass and glazing codes governing the design and use of products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility for these design considerations. It is the responsibility of the owner, specifier, architect, general contractor and the installer to make these selections in strict conformance with all applicable codes.
- K. EXPANSION JOINTS** - Expansion joints and perimeter seals shown in these instructions and in the shop drawings are shown at normal size. Actual dimensions may vary due to perimeter conditions and /or difference in metal temperature between the time of fabrication and time of installation. For example, a 12 foot unrestrained length of aluminum extrusion can expand or contract 3/32" over a 50° F temperature change. Any movement potential should be accounted for at the time of installation.

- L. FIELD TESTING** - It is recommended that a Water Hose Test be conducted once a sufficient portion of the framing is installed, glazed and caulked to ensure proper installation. The Water Hose Test shall be conducted in accordance with AAMA 501.2. In addition, larger projects should have periodic Water Hose Tests as additional precautionary measures.
- M. GASKET INVENTORY ROTATION** - These high quality rubber extrusions are coated with silicone lubricant. Silicone will dry over time leaving a white "chalky" residue. Please rotate your stock "FIRST IN - FIRST OUT". If the rubber becomes dry, you may use water ONE TIME to reconstitute the silicone, after that, use a soap water solution.

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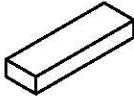
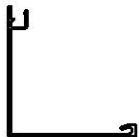
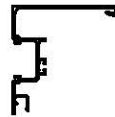
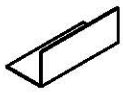
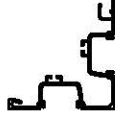
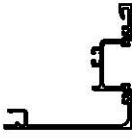
	451 IR - CENTER SET OUTSIDE GLAZED	451T IR - CENTER SET OUTSIDE GLAZED
SCREW SPLINE FRAMING		
Mullion and Filler	451-CG-001 451-CG-002	451T-CG-001 451T-CG-002
Jamb	451-CG-001	451T-CG-001
Head	451-CG-003	451T-CG-003
Horizontal	451-CG-011	451T-CG-011
Sill	451-CG-001	451T-CG-001
Glass Stop	451-CG-004	451-CG-004
Flashing	451-HP-037	451T-HP-037
Spline Screw	028-856	028-856
End Dam	450114	450114
Drill Fixture	451-VG-201	451-VG-201
90° SNAP CORNERS		
No Pocket Corner Half	450-017	450-017
One Pocket Corner Half	451-CG-015	451T-CG-015
One Pocket Corner Half (OPPOSITE OF 451-XX-015)	451-CG-035	451T-CG-035
Two Pocket Corner Half	451-CG-016	451T-CG-016
MISCELLANEOUS		
Flat Filler - Non Thermal	450-026	450-026
HP Flashing Clip - 12" Long	451-HP-127	451-HP-127
OPTIONAL MULLIONS & STEEL REINFORCING		
Medium Weight Mullion	451-CG-001A	451T-CG-001A
Heavy Weight Mullion	451-CG-013	451T-CG-013
Extra Heavy Weight Mullion	451-CG-113	451T-CG-113
Expansion Mullion Male Half with Weathering	451-CG-540	451T-CG-540
Expansion Mullion Female Half	451-CG-010A	451T-CG-010A
GLAZING MATERIALS		
Water Deflector	451-105	
Sill Setting Block	027-073	
Horizontal Setting Block	027-081	
Side Block	480-520	
Standard Push-on Gasket	027-074	
ANCHORS		
Fastener / Shim Support - 3" LONG	450-126	
Fastener / Shim Support - 12" LONG	451-CG-363	

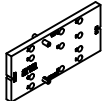
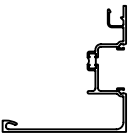
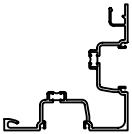
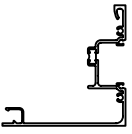
FRAMING MEMBER (CENTER)	CUT FORMULA
MULLIONS AND MULLION FILLERS	FRAME HEIGHT - 1/2"
JAMBS	FRAME HEIGHT - 1/2"
CORNER MULLIONS	FRAME HEIGHT - 1/2"
FLASHING	FRAME WIDTH PLUS 1/4"
EXPANSION MULLIONS	FRAME HEIGHT - 1/2"
HEAD MEMBERS	DLO
HORIZONTALS & HORIZONTAL FILLERS	DLO
SILL MEMBERS	DLO
GLASS STOPS	DLO-1/16"

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PART NO.	DESCRIPTION	ILLUSTRATION	PART NO.	DESCRIPTION	ILLUSTRATION
027-073	SILL SETTING BLOCK (451/451T)		451-CG-002	POCKET FILLER	
027-074	STANDARD PUSH ON GASKET		451-CG-003	HEAD	
027-081	HORIZONTAL SETTING BLOCK (451/451T)		451-CG-004	GLASS STOP	
028-856	#12x1-1/8 PHTF TYPE "AB" (SPLINE SCREW)		451-CG-010A	TUBULAR EXPANSION MULLION FEMALE HALF	
063-040	BALL POINT BIT FOR 128-242		451-CG-011	HORIZONTAL	
128-242	OPTIONAL BALL POINT SPLINE SCREW #12x1 SOCKET HEAD		451-CG-013	HEAVY WEIGHT MULLION	
450-017	90° NO POCKET CORNER HALF		451-CG-015	ONE POCKET CORNER HALF	
450-114	END DAM		451-CG-016	TWO POCKET CORNER HALF	
451-105	WATER DEFLECTOR (451/451T)		451-CG-035	ONE POCKET CORNER HALF	
480-520	SIDE BLOCK		451-CG-037	HP SILL FLASHING	
451-CG-001	MULLION JAMB SILL		451-CG-113	HEAVY WEIGHT MULLION	
451-CG-001A	MEDIUM WEIGHT MULLION		451-HP-127	HP SILL CLIP 12" LONG	

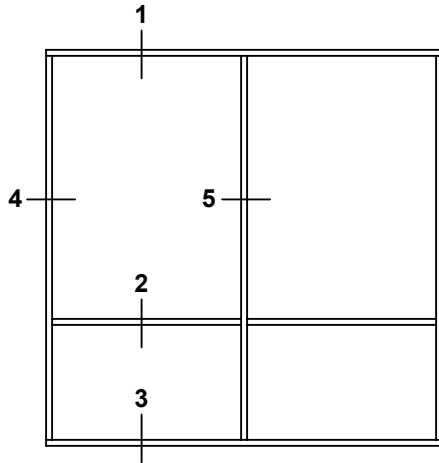
PART NO.	DESCRIPTION	ILLUSTRATION	PART NO.	DESCRIPTION	ILLUSTRATION
451-CG-363	FLAT FILLER/SHIM SUPPORT (12" LONG)		451T-CG-037	HP SILL FLASHING	
451-CG-540	EXPANSION MULLION W/WEATHERING MALE HALF		451T-CG-113	HEAVY WEIGHT MULLION	
451T-CG-001	MULLION JAMB SILL		451T-CG-540	EXPANSION MULLION W/WEATHERING MALE HALF	
451T-CG-001A	MEDIUM WEIGHT MULLION		451-VG-201	DRILL FIXTURE SCREW-SPLINE (451/451T)	
451T-CG-002	POCKET FILLER				
451T-CG-003	HEAD				
451T-CG-010A	TUBULAR EXPANSION MULLION FEMALE HALF				
451T-CG-011	HORIZONTAL				
451T-CG-013	HEAVY WEIGHT MULLION				
451T-CG-015	ONE POCKET CORNER HALF				
451T-CG-016	TWO POCKET CORNER HALF				
451T-CG-035	ONE POCKET CORNER HALF				

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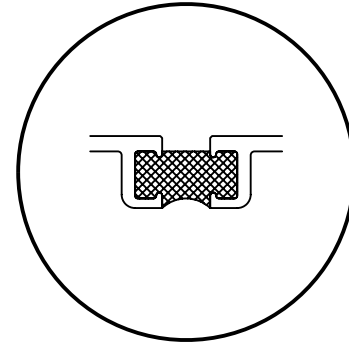
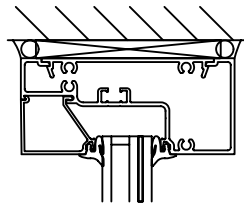
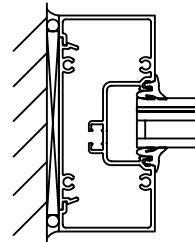
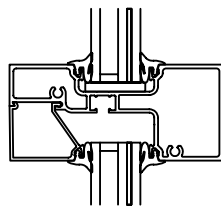
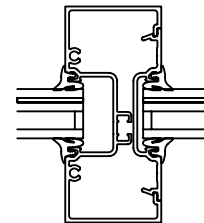
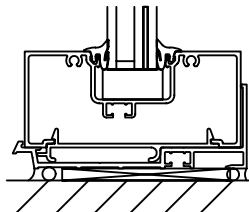
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The Screw Spline System is a fabrication and erection method that permits the pre-assembly of single units in the shop or at the job site. These units are then erected by mating the male mullion half of one unit with the female half of the unit already installed.



ELEVATION IS NUMBER KEYED TO DETAILS

TRIFAB® 451T-IR
THERMALLY BROKEN MEMBERS1
HEAD2
HORIZONTAL4
JAMB5
VERTICAL3
SILL

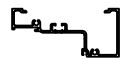
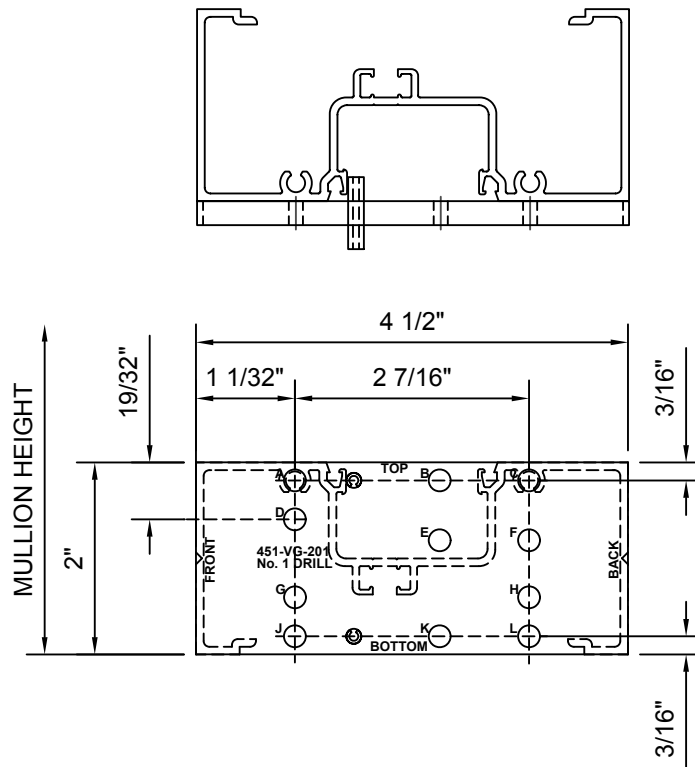
FRAME FABRICATION AND ASSEMBLY

STEP A: Measure the opening to determine length of vertical and horizontal framing members. For all units that require sill flashing, allow a minimum of $7/16"$ for high performance flashing when measuring vertical lengths. Allow $1/4"$ min. clearance at the head, sill, and jamb to facilitate installation and provide space for caulking. If job conditions are uncertain, or masonry openings are irregular, or high-performance flashing is used, allow extra clearance to accommodate construction tolerance.

STEP B: Cut vertical members to required length. At desired horizontal locations drill the proper holes in the vertical members for attachment of the spline screws, as shown below.

TRIFAB 451/451T (FRAMING)

PLACE ONTO MULLION AS SHOWN BELOW



HEAD PREP = HOLES (D, L)



HORIZONTAL PREP = HOLES (D, L)



SILL PREP = HOLES (A, C)

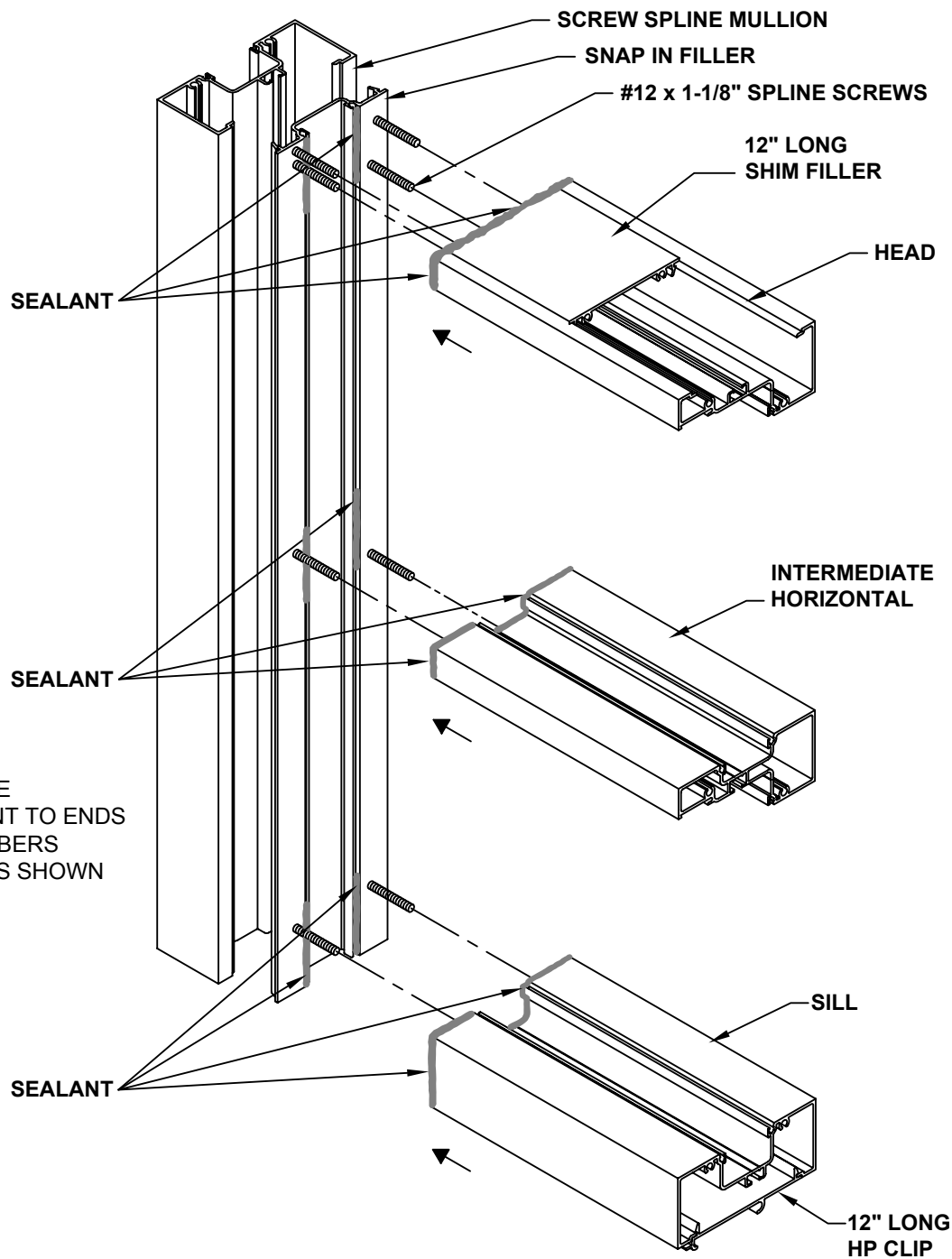
FRAME FABRICATION & ASSEMBLY SCREW SPLINE ASSEMBLY

STEP A: Cut horizontals to length and apply sealant to the ends ensuring a good seal to the vertical member.

STEP B: Assemble the units using two 028-856 screws (#12 x 1-1/8" PH) at each horizontal and sill; and four at head member as shown below. Be sure that each unit is fabricated with a male and female mullion half.

NOTE: Every unit must have at least one deep vertical pocket.

STEP C: When an entrance is required, Shear Block joinery must be used to attach horizontals to the immediate door frame. The other side of the sidelite will be fabricated for screw spline joinery as usual.



NOTE:
IT IS IMPORTANT THAT THE
INSTALLER APPLY SEALANT TO ENDS
OF ALL HORIZONTAL MEMBERS
AND GLAZING REGLETS AS SHOWN
TO ENSURE GOOD SEAL.

INSTALLATION OF END DAMS AND SPLICES

Pin End Dam to Flashing prior to installation.
Seal any fastener shanks than pierce flashing.

Install flashing at the sill and attach it to the floor. The flashing should be shimmed up a minimum of 1/4" to make sure that it is flat and level. It should run the full width of the opening - 1/4", and be interrupted only at entrances. The flashing must be carefully sealed at each end. Use end dams for all typical perimeter conditions, and seal the end dams to the flashing and perimeter conditions as shown below.

Note:

If the opening is over 24'-0" wide a splice joint is required every 12'-0", with a 1/2" joint between head and sill members at the center of the DLO. Do not locate splice directly under a vertical mullion.

Apply bond breaker tape to the underside of the aluminum splice sleeve as shown on center.

Clean splice area with solvent.

Note: For temperatures below 40°, take the following precautions.

Just prior to installing the sleeve, wipe flashing material with a solvent or cleaning solution recommended by the sealant manufacture. This will remove any condensation or frost that may be present.

Caution: Carefully follow the recommendations contained in the material safety data sheet provided by the solvent / cleaning solution manufacturer regarding health and fire / explosion risks.

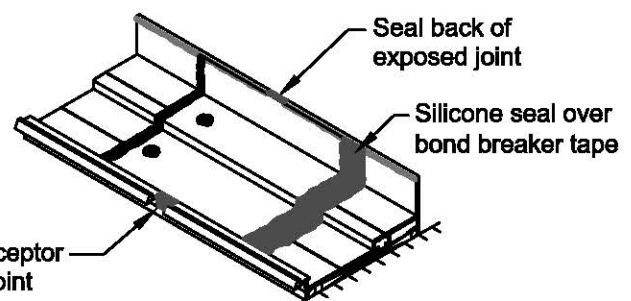
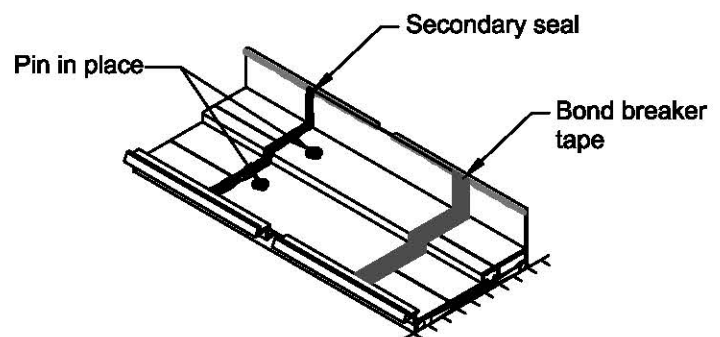
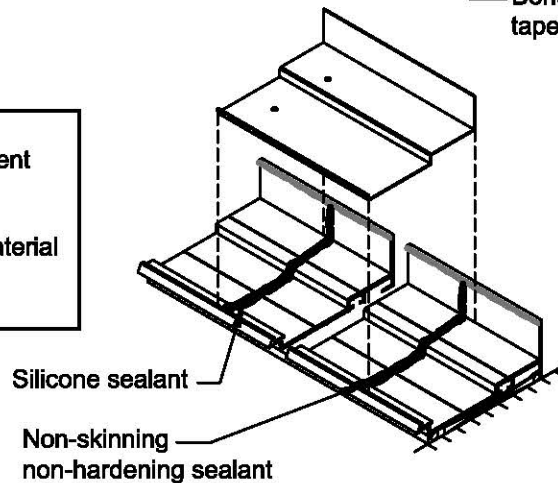
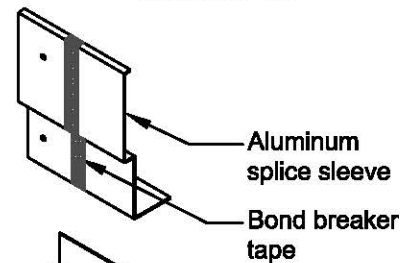
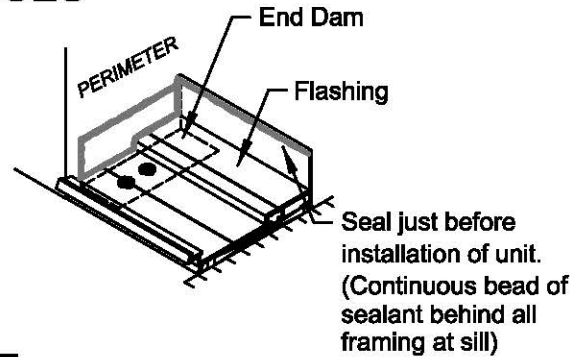
Apply heavy bead of silicone sealant on one receptor and bead of non-skinning, non-hardening sealant on the other receptor. Install splice sleeve so that bond breaker tape aligns with splice joint as shown.

Pin splice sleeve on the side with the silicone joint and seal over heads of pins. Apply a secondary silicone seal on the pinned side as shown.

Apply bond breaker tape over the joint between the splice and receptor on the bead of non-skinning, non hardening sealant side of splice.

Apply silicone sealant over the bond breaker tape to create a water tight joint as shown.

Seal exposed joint at the back of the sill flashing, and force sealant up under the splice sleeve in the front.



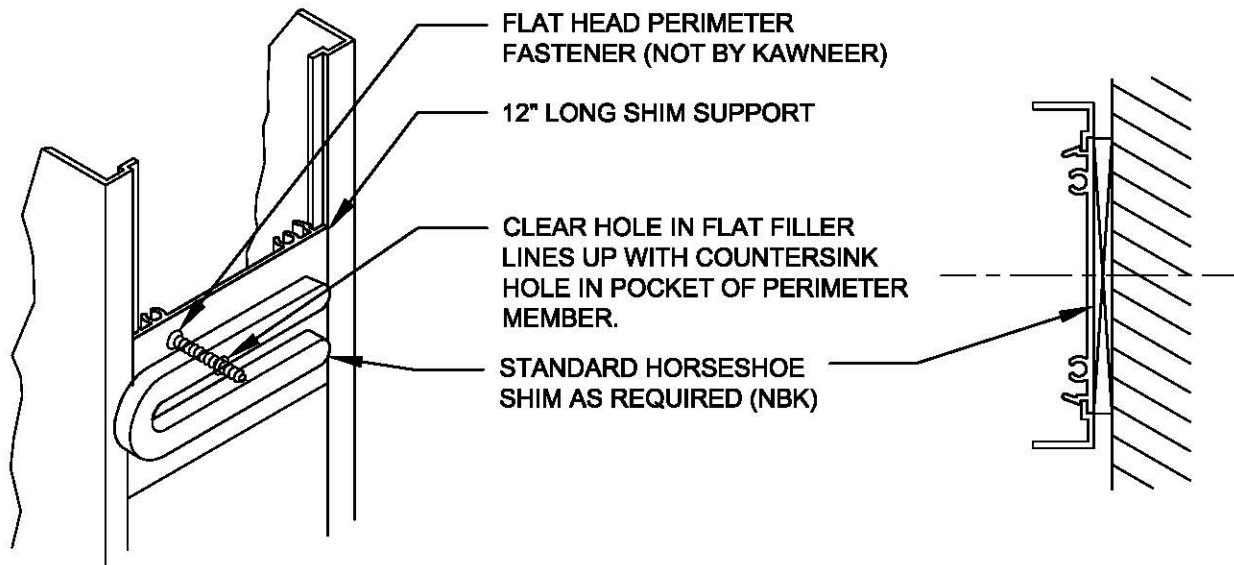
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SHIM INSTALLATION

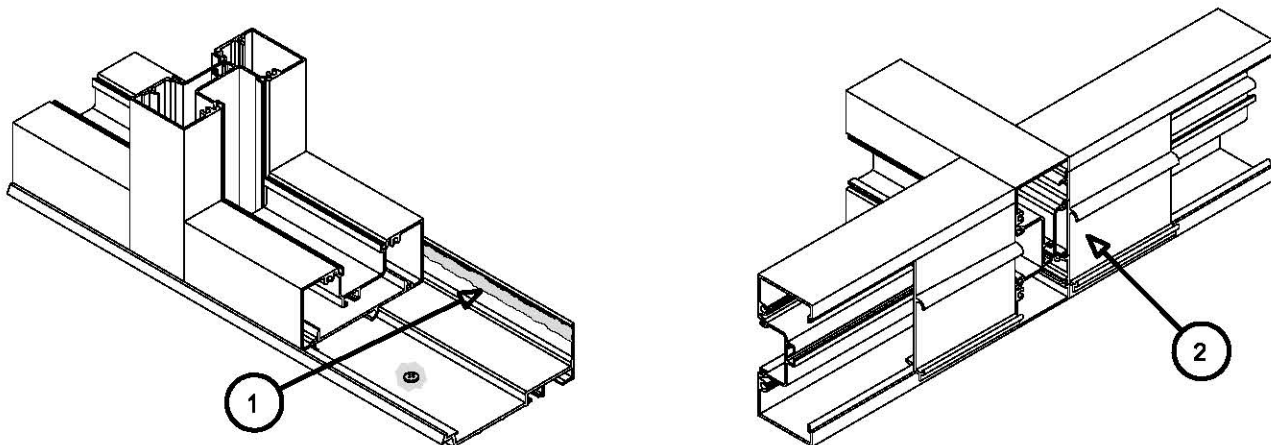
Install support shims at head, sill and jamb. Place between pocket filler and perimeter condition at perimeter anchor locations.



HP SILL FLASHING

STEP 1: Apply sealant to the upstanding leg on the flashing.

STEP 2: Install HP interlocking sill clip into sill on each side of the vertical and crimp in place to prevent sliding.



HP SILL FLASHING (Continued)

STEP 3: Position assembled frame onto sill tilted out at approximately 20 degrees 1A. Allow the interlocking sill clip to engage with the lug of the flashing, and rotate to vertical position.

STEP 4: Caulk both interior and exterior at head, jamb and under sill flashing with high quality sealant. Do not block weep holes in flashing.

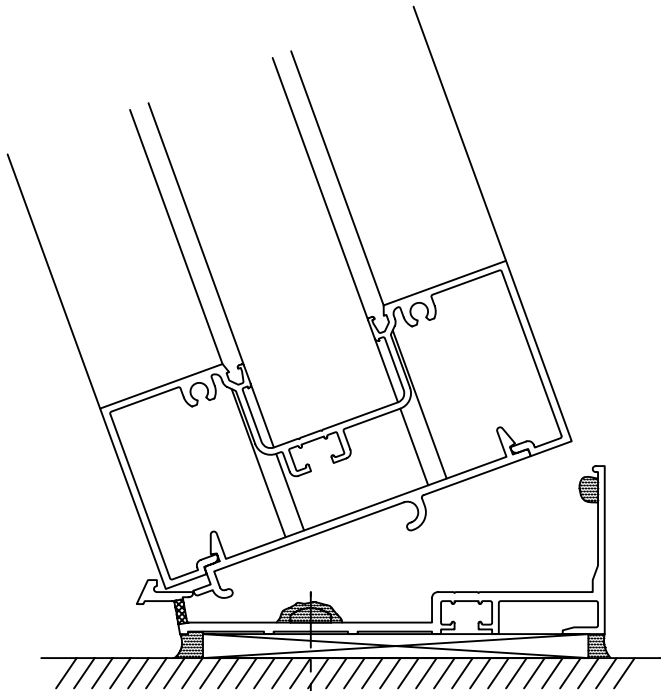


FIGURE 1A

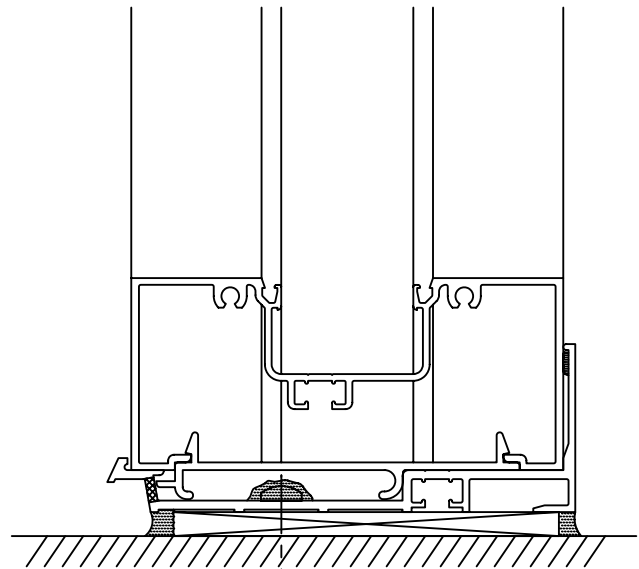
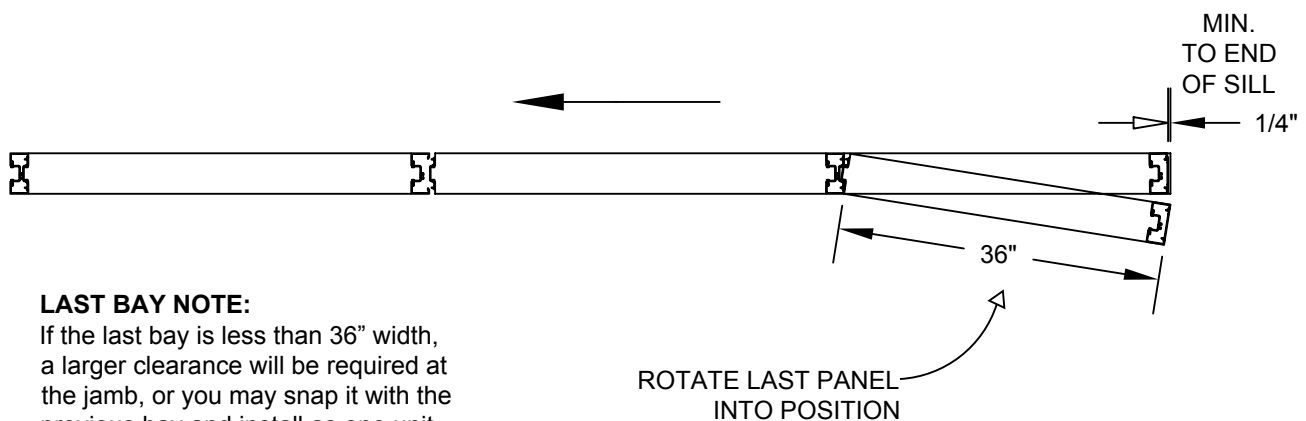


FIGURE 1B

NOTE:
HP flashing must extend beyond the edge of the frame by 1/4" minimum.



LAST BAY NOTE:

If the last bay is less than 36" width, a larger clearance will be required at the jamb, or you may snap it with the previous bay and install as one unit.

ROTATE LAST PANEL
INTO POSITION

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WATER DEFLECTOR

Install water deflectors on Intermediate Horizontals by removing the paper backing from the water deflectors. Install on a clean, dry surface centered in the glazing pocket and seal. (Figure 1) Be sure to extend Water Deflector past glass edge below. (Figure 2)

SEAL
AROUND
ALL THREE
SIDES OF
WATER
DEFLECTOR

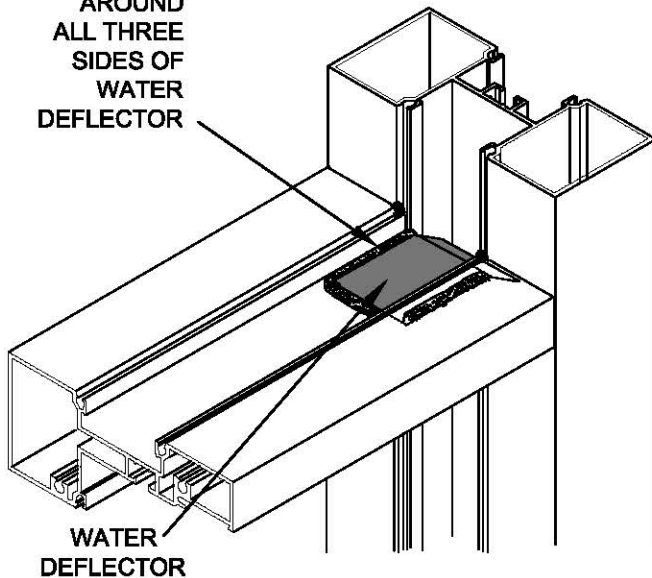


FIGURE 1

COLD WEATHER NOTE:

For temperatures below 40° the following precautions should be taken. Just prior to installing the water deflector, wipe glazing pocket with a solvent or cleaning solution recommended by the sealant manufacturer.

*CAUTION:

Carefully follow the recommendations contained in the material safety data sheet provided by the solvent/cleaning solution manufacturer regarding health and fire/explosion risks.

EXTEND WATER
DEFLECTORS PAST
GLASS EDGE BELOW

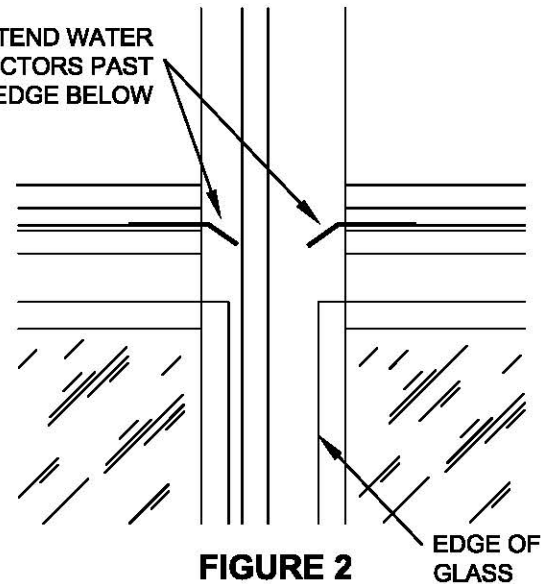


FIGURE 2

After the water deflector is installed, seal the joint between the back leg of the horizontal and the vertical. Make sure to fill the gasket reglets in the area to prevent water from running down the lite below. (Figure 3 and 4)

SEAL
UNDER
GLAZING
REGLETS

WATER
DEFLECTOR

SEAL
GLAZING REGLETS

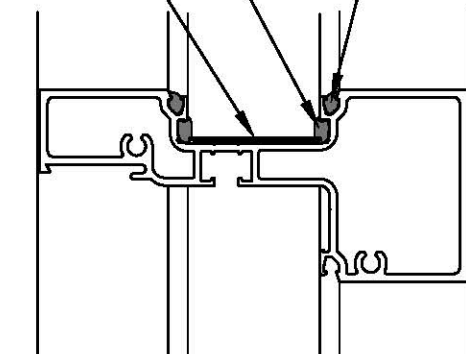


FIGURE 3

NOTE:
FOR THERMAL MEMBERS,
SEAL UNDER DEFLECTOR
FILLING CAVITIES WITH
SEALANT. (FIGURE 4)

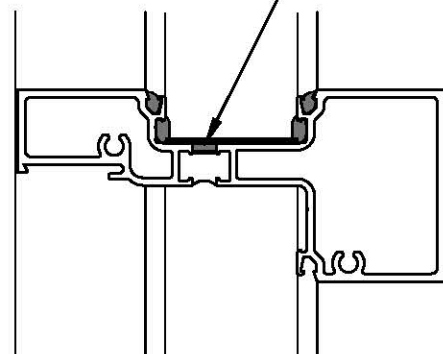


FIGURE 4

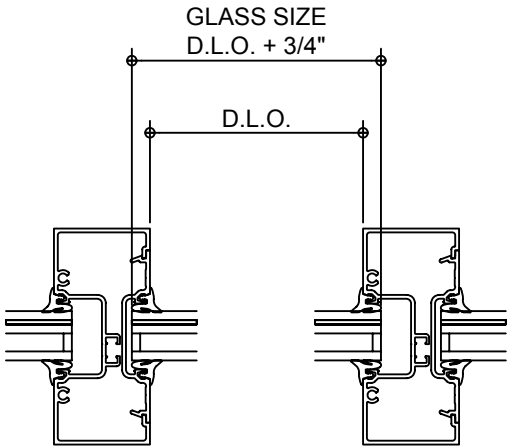
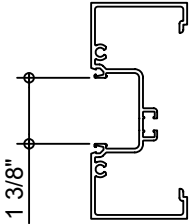
GLAZING

STEP A: All pockets are 1-3/8" in width and will accept 1" to 1-1/32" Laminated glass.

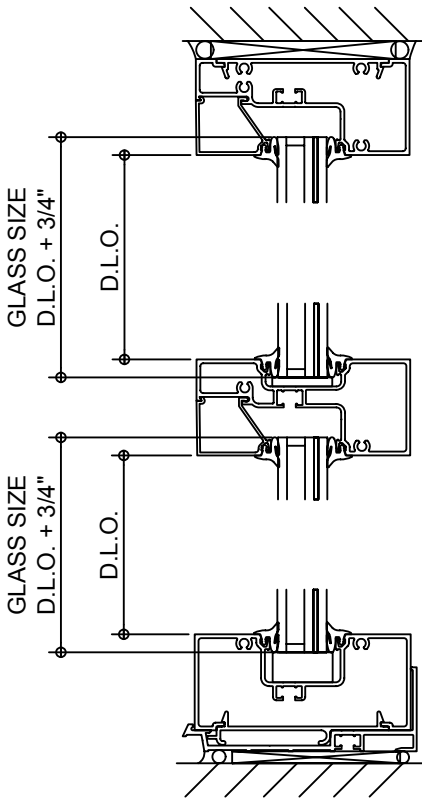
STEP B: Glass size is (Daylight Opening) D.L.O. + 3/4".

NOTE 1: This formula does not allow for undersize or out of square daylite openings.

NOTE 2: The glass manufacturer must indicate the specific glazing requirements for the material being used.



Infill Thickness	Weathering (Both Sides)
1"	27-074 (Standard)
1-1/32"	27-074 (Standard)



Glazing Types
1-1/32" Laminated glass 3/16" HS Outboard / 3/8" Air Space / 3/16" HS Inboard / 0.090 Dupont SG / 3/16" HS Inboard

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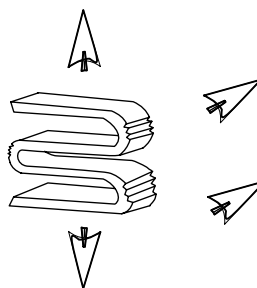
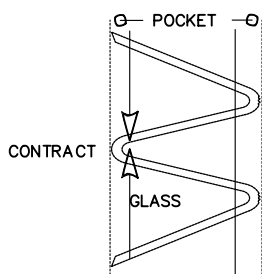
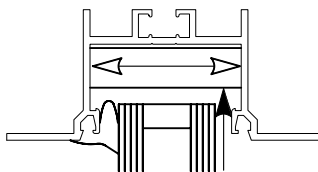
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GLAZING

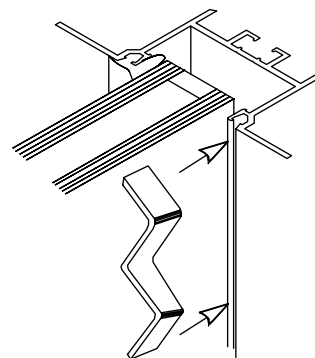
"W" SIDE BLOCKS

One "W" Side Block should be installed in the deep pocket of the mullion of each lite of glass in the opening.

SIDE BLOCK INSTALLATION



FLATTEN BLOCK & SLIDE
BETWEEN REGLET AND
GLASS LITE



INSERT BETWEEN
GLASS AND FRAME

"W" Block will expand and wedge between walls of glazing pocket and prevent glass from shifting into the deep pocket.

NOTE: If deglazing of lite is required after "W" Block is installed, remove both interior and exterior weathering and use hook to pull "W" Block out of pocket.

GASKET AND GLASS STOP INSTALLATION

STEP 1: Cut horizontal and vertical gaskets to an approximate length of D.L.O. + 1/4" per foot of D.L.O..

STEP 2: Install gaskets on the side of frame **opposite** glass stop first. ①

Insert gaskets into the horizontal members first starting at the ends and work toward the center as shown.

(see Figure 1)

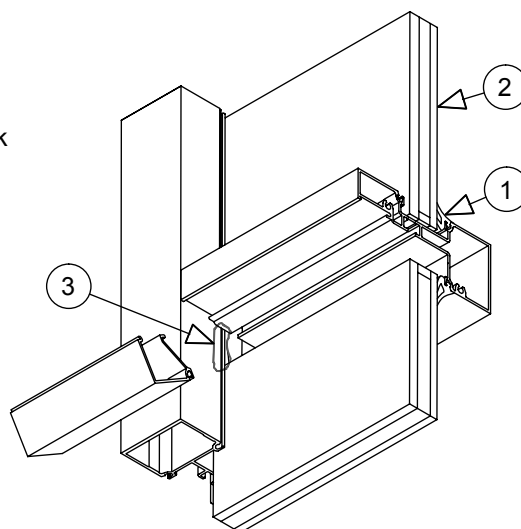
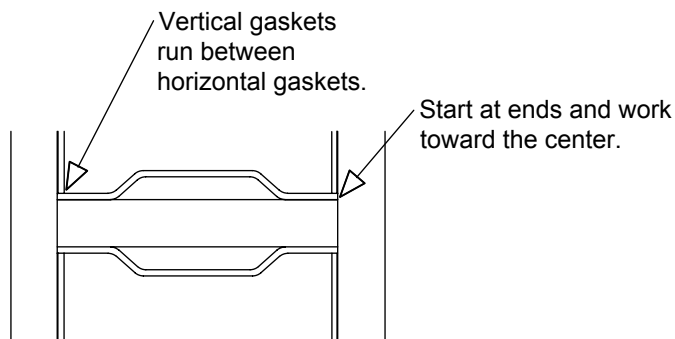
Install vertical gaskets into the same side of frame after horizontal gaskets are in place in the same manner.

STEP 3: Position setting blocks at points under glass as required. ②

STEP 4: Install glass into frame using standard flush glazing technique. ③

STEP 5: Run bead of sealant along vertical reglets where glass stop meets, then install glass stop. ③

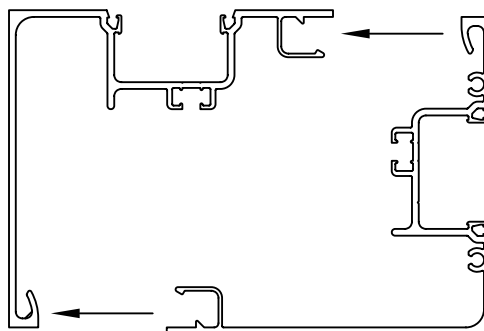
STEP 6: Install horizontal and vertical gasket into **glass stop side** of frame in the same manner as described in Step #2.



SNAP CORNERS

Snap corners together as shown

NOTE: Tight snaps may be waxed to make engagement easier. Corners are not designed to be unsnapped.

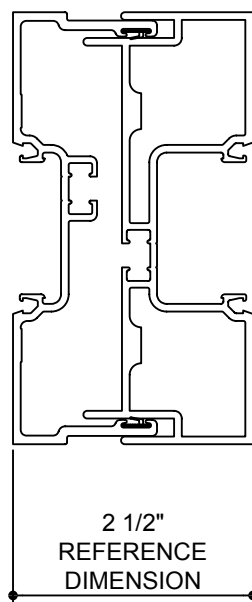


90° CORNER

EXPANSION MULLION

An Expansion Mullion is to be used every 20' in large openings, regardless of the method of construction.

The dimension of the assembly should be adjusted based on the temperature at the time of assembly and expected high and low service temperatures use reference dimension. (For examples, the sight line will be reduced slightly when installed in hot weather and increased slightly when installed in cold weather).



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KAWNEER COMPANY, INC
TECHNOLOGY PARK/ATLANTA
555 GUTHERIDGE COURT
NORCROSS, GA 30092

GENERAL NOTES:

1. THESE STORE FRONT SYSTEMS HAVE BEEN TESTED, ANALYZED & APPROVED FOR DESIGN PRESSURES NOT TO EXCEED THOSE SHOWN IN THE "ALLOWABLE DESIGN PRESSURE TABLE(S)".
2. OPENINGS, BUCKING & BUCKING FASTENERS MUST BE PROPERLY DESIGNED & INSTALLED TO TRANSFER WIND LOADS TO THE STRUCTURE.
3. ALL HARDWARE & FASTENERS SHALL BE IN ACCORDANCE WITH THESE DRAWINGS & SHALL NOT VARY UNLESS SPECIFICALLY MENTIONED ON THE DRAWINGS. SPECIFIED ANCHOR EMBED TO BASE MATERIAL SHALL BE BEYOND WALL FINISH OR STUCCO.
4. THE DETAILS & SPECIFICATIONS SHOWN HEREIN REPRESENT THE PRODUCTS TESTED & PROPOSED FOR WATER, AIR, IMPACT, CYCLIC & UNIFORM STATIC AIR PRESSURE TESTING IN CONFORMANCE WITH ASTM E330, E283, E331, E1886 & E1996 FOR LARGE MISSILE IMPACT STORE FRONT SYSTEMS.
5. THESE STORE FRONT SYSTEMS HAVE BEEN DESIGNED IN ACCORDANCE WITH AND MEET THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (IBC).
6. IMPACT SHUTTERS ARE NOT REQUIRED WITH THIS STORE FRONT SYSTEM.
7. ALL ANCHORS SECURING STORE FRONT FRAME TO PRESSURE TREATED BUCKS OR WOOD FRAMING SHALL BE CAPABLE OF RESISTING CORROSION CAUSED BY THE PRESSURE TREATING CHEMICALS IN THE WOOD.
8. DETERMINE THE POSITIVE & NEGATIVE DESIGN LOADS TO USE WHEN REFERENCING THESE DOCUMENTS IN ACCORDANCE WITH THE GOVERNING CODE AND GOVERNING WIND VELOCITY. FOR WIND LOAD CALCULATIONS IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, A DIRECTIONALITY FACTOR OF $K_D = 0.85$ MAY BE APPLIED PER THE ASCE-7 STANDARD.
9. NO INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE CERTIFICATION OF THIS PRODUCT. WIND LOAD DURATION FACTOR $C_D = 1.6$ WAS USED FOR WOOD SCREW ANALYSIS ONLY.
10. MATERIALS, INCLUDING BUT NOT LIMITED TO STEEL SCREWS, THAT COME INTO CONTACT WITH OTHER DISSIMILAR MATERIALS SHALL BE SEPARATED OR COATED AS REQUIRED TO AVOID CORROSION OF EITHER MATERIAL.
11. TO THE BEST OF OUR KNOWLEDGE, THE STORE FRONT SYSTEMS SHOWN HEREIN ARE QUALITY ASSURED BY AN APPROVED CERTIFICATION/QA ENTITY & SHALL BE LABELED IN ACCORDANCE WITH APPLICABLE STANDARDS. THESE DRAWINGS SHOW ALL APPLICABLE ELEVATION, COMBINATION, INSTALLATION & COMPARATIVE ANALYSIS CONDITIONS AS DETERMINED THROUGH TESTING & ENGINEERING RATIONAL ANALYSIS. STORE FRONT ASSEMBLY SHALL BE IN ACCORDANCE WITH THESE DRAWINGS, THE MANUFACTURER'S QUALITY ASSURANCE SPECIFICATIONS & TESTING REPORTS.
12. CERTIFICATION OF THESE STORE FRONT SYSTEMS SHALL BE CONSIDERED VOID IF THEY ARE INSTALLED WITHOUT A BUILDING PERMIT FROM THE APPLICABLE LOCAL BUILDING DEPARTMENT OR IF THEY ARE INSTALLED BY ANYONE OTHER THAN A LICENSED CONTRACTOR EXPERIENCED WITH STORE FRONT INSTALLATIONS.

FRAME END/CORNER CONSTRUCTION:

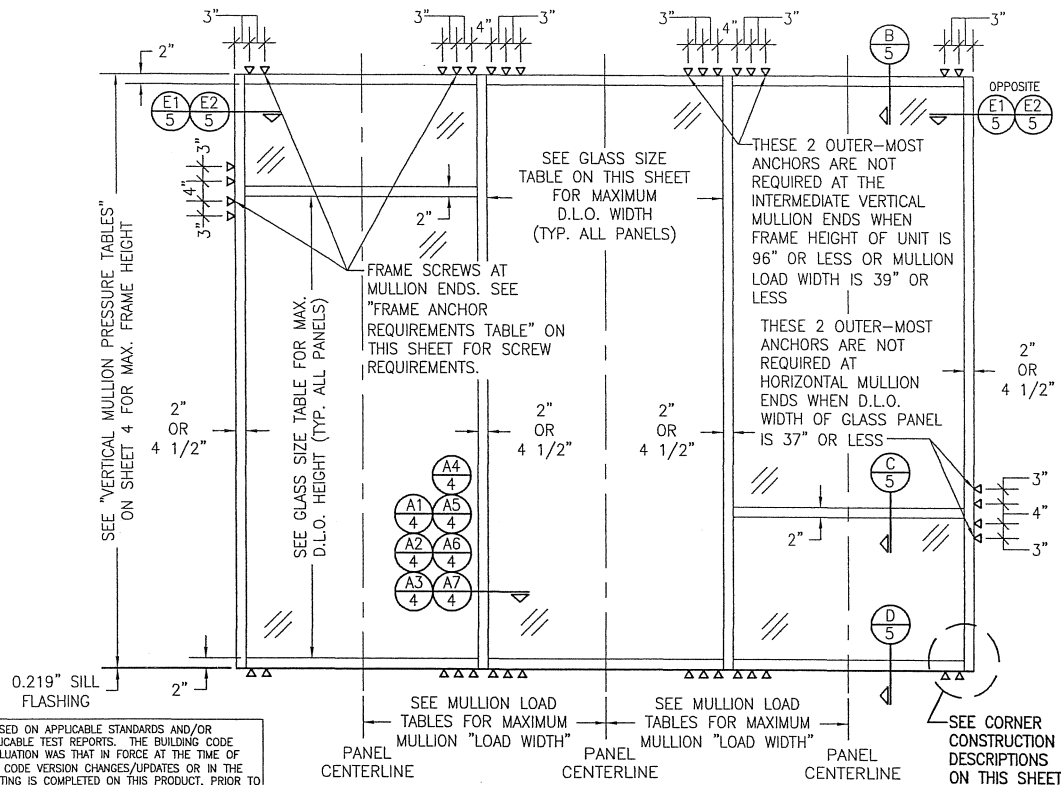
VERTICAL FRAME MEMBERS RUN THROUGH WITH HORIZONTAL FRAME MEMBERS RUNNING BETWEEN THE VERTICALS. APPLY SEALANT TO BOTH ENDS OF ALL HORIZONTAL FRAME MEMBERS AND GLAZING REGLETS. SECURE VERTICAL FRAME MEMBERS TO THE HORIZONTAL FRAME MEMBERS WITH NO. 12 X 1 1/8" PHIT SCREWS RUN THROUGH THE VERTICAL MEMBERS & INTO THE HORIZONTAL MEMBER SCREW SPLINES (QUANTITY OF SCREWS TO MATCH THE NUMBER OF SCREW SPLINES). PIN SILL END DAMS TO SILL FLASHING WITH 1 NO. 6 SCREW & APPLY SEALANT TO END DAMS. TOOL SEALANT AT ALL LOCATIONS.

ALLOWABLE GLASS SIZE TABLE		ALLOWABLE DESIGN PRESSURE
		AS CONTROLLED BY GLASS: +/-45 PSF
		AS CONTROLLED BY DOORS: SEE RESPECTIVE DOOR APPROVAL.
		AS CONTROLLED BY VERTICAL MULLIONS: SEE MULLION PRESSURE TABLE ON SHEET 4.
		NOTE: LESSER OF THE ALLOWABLE PRESSURE ON THE GLASS, DOORS & VERTICAL MULLIONS SHALL CONTROL AS THE ALLOWABLE PRESSURE ON THE ASSEMBLY.
MAXIMUM D.L.O. WIDTH (IN.)	MAXIMUM D.L.O. HEIGHT (IN.)	
48	93 5/16	
45	99 1/2	
42	106 5/8	
39	114 3/4	
38	116	

FRAME ANCHOR REQUIREMENTS TABLE
(FRAME, SILL & DOOR JAMB MULLION CLIP SCREWS)

OPENING TYPE (SUBSTRATE)	FRAME TO OPENING FASTENER TYPE	MINIMUM EMBED	MINIMUM EDGE DIST.
MIN. 2X4 WOOD FRAME OR BUCK (MIN. GR. 3 & $G=0.55$)	NO. 14 SMS OR WOOD SCREW	1 1/4"	3/4"
MIN. 16 GA. 33 KSI METAL STUD	1/4-14 GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
MIN. 1/8" THK A36 STEEL	1/4-14 GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
MIN. 1/8" THK 6063-T5 ALUM.	1/4-14 GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
MIN. C-90 CMU (SIDES ONLY)	(1) 1/4" CONCRETE SCREW	1 1/4"	2"
MIN. 3000 PSI CONCRETE	(1) 1/4" CONCRETE SCREW	1 3/4"	2"

(1) CONCRETE SCREWS SHALL BE ELCO ULTRACONS, ELCO CRETE-FLEX, ITW RAMSET/RED HEAD TAPCONS OR HILTI KWIK-CON II (HARDENED STEEL OR S.S.).



EXTERIOR ELEVATION:
MULTIPLE FIXED PANEL STOREFRONT ASSEMBLY

SCALE: 1/2" = 1'-0"

UNIT NOTES:

1. HORIZONTAL STACKING & OVERALL UNIT WIDTH IS UNLIMITED PROVIDING D.L.O. DOES NOT EXCEED THAT SPECIFIED IN THE GLASS SIZE TABLE.
2. NUMBER OF GLASS PANELS STACKED VERTICALLY WITHIN IN ONE BAY IS UNLIMITED PROVIDING THE OVERALL FRAME HEIGHT DOES NOT EXCEED THAT ALLOWED IN THE MULLION LOAD TABLES.
3. GLASS PANELS MAY BE FULL HEIGHT OF UNIT OR BE SPLIT WITH INTERMEDIATE HORIZONTAL MULLIONS PROVIDING D.L.O. OF EACH PANEL DOES NOT EXCEED THAT SPECIFIED IN THE GLASS SIZE TABLE.

PRODUCT LIMITS OF USE APPLICABLE TO ALL STOREFRONT CONDITIONS SHOWN WHEN GLASS OPTION 1 IS USED (NOT APPLICABLE WHEN GLASS OPTION 2 IS USED):

- A) THIS STOREFRONT SYSTEM MAY NOT BE INSTALLED AT SMALL MISSILE IMPACT LOCATIONS OF ANY BUILDING (OVER 30 FT. ABOVE GRADE).
- B) USE OF THIS STOREFRONT SYSTEM IS NOT APPLICABLE UNLESS THE VERTICAL EDGE OF THE STOREFRONT GLASS IS GREATER THAN 24" FROM ANY OPERABLE DOOR PANEL EDGE & ONE OF THE FOLLOWING APPLIES:
 1. ALL WALKWAYS HAVE A MINIMUM 36" SEPARATION BETWEEN THE EDGE OF THE WALKWAY AND THE FACE OF THE STOREFRONT GLASS.
 2. BOTTOM EDGE OF THE STOREFRONT GLASS IS 18" OR GREATER ABOVE THE WALKING SURFACE.

THESE DRAWINGS ARE APPLICABLE ONLY TO THE PRODUCT SPECIFIED. THEY MAY NOT BE USED FOR THE ASSEMBLY AND/OR INSTALLATION OF ANY OTHER PRODUCT NOR MAY THEY BE USED FOR RATIONAL AND/OR LOCAL APPROVAL OF ANY PRODUCT NOT PRODUCED BY THE MANUFACTURER STATED ON THESE DRAWINGS.



DRAWN BY: W.S.		CHECKED BY: W.S.	
PLOT: 1=24		DATE: 03/19/13	
DATE	BY	REVISION DESCRIPTION	NO.
JOB INFORMATION:		KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555	
CONSULTANTS:		W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14960) 7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE 561-744-3424	
DRAWING TITLE:		TRIFAB 451/451T LARGE MISSILE IMPACT STOREFRONT SYSTEM	
DATE:		MAR 9 2013	
DRAWING NO.		1726T	
SHEET NO.		1 OF 8	

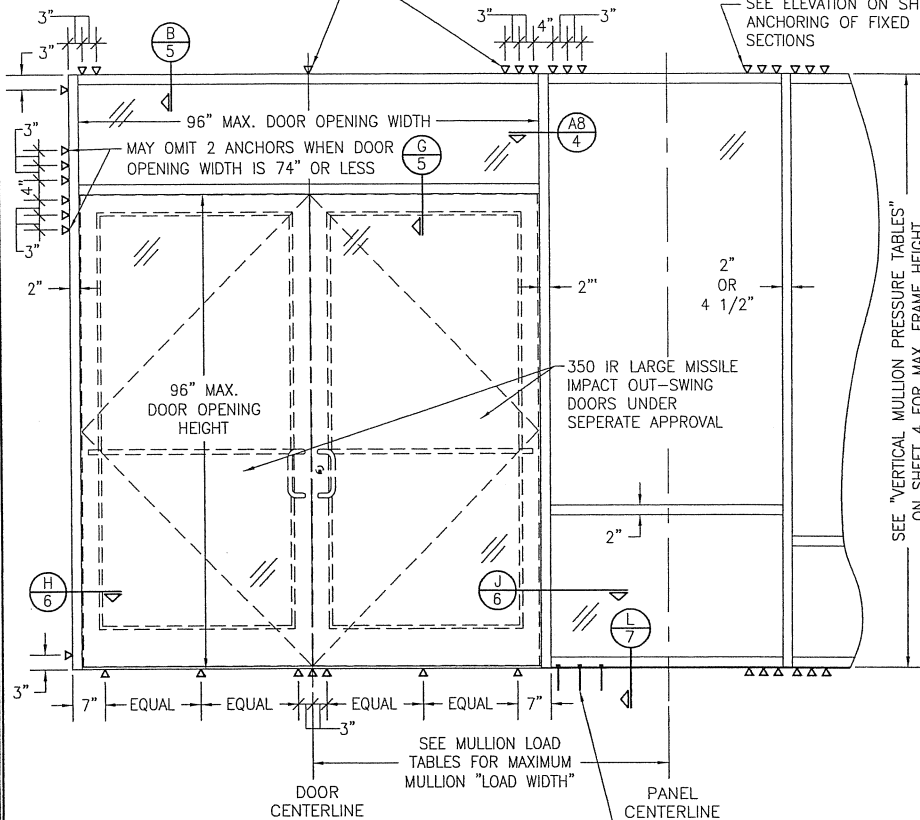
FRAME & SILL SCREWS WHERE SHOWN. SEE "FRAME ANCHOR REQUIREMENTS TABLE" ON SHEET 1 FOR SCREW REQUIREMENTS.

NOTE: 6 ANCHORS ARE ALWAYS REQUIRED AT DOOR JAMB MULLION END WHEN DOUBLE DOORS & TRANSOM EXIST.

SEE ELEVATION ON SHEET 1 FOR ANCHORING OF FIXED PANEL SECTIONS

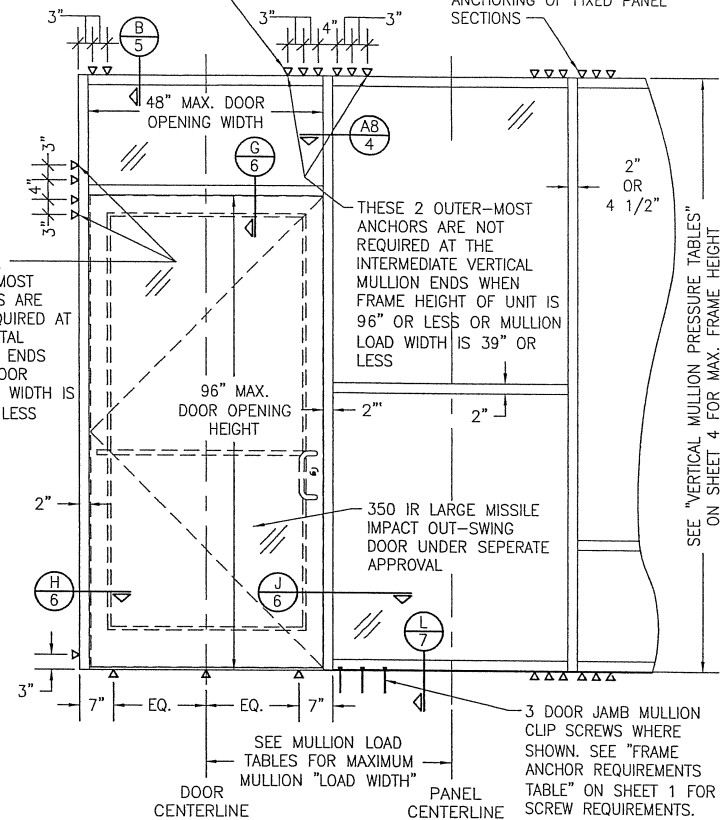
FRAME & SILL SCREWS WHERE SHOWN. SEE "FRAME ANCHOR REQUIREMENTS TABLE" ON SHEET 1 FOR SCREW REQUIREMENTS.

SEE ELEVATION ON SHEET 1 FOR ANCHORING OF FIXED PANEL SECTIONS



**EXTERIOR ELEVATION:
STORE FRONT ASSEMBLY WITH
DOUBLE DOOR & TRANSOM**

SCALE: 1/2"=1'-0"



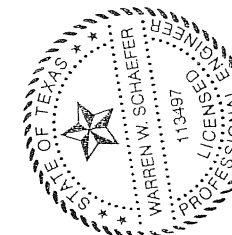
**EXTERIOR ELEVATION:
STORE FRONT ASSEMBLY WITH
SINGLE DOOR & TRANSOM**

SCALE: 1/2"=1'-0"

UNIT NOTES (SINGLE & DOUBLE DOOR ELEVATIONS):

1. SIDELIGHTS AT ONE SIDE OF DOOR SHOWN. SIDELIGHTS MAY BE PLACED AT ONE OR BOTH SIDES OF DOORS.
2. HORIZONTAL STACKING & OVERALL UNIT WIDTH IS UNLIMITED PROVIDING FIXED PANEL D.L.O. DOES NOT EXCEED THAT SPECIFIED IN THE GLASS SIZE TABLE.
3. NUMBER OF GLASS PANELS STACKED VERTICALLY WITHIN IN ONE BAY IS UNLIMITED PROVIDING THE OVERALL FRAME HEIGHT DOES NOT EXCEED THAT ALLOWED IN THE MULLION LOAD TABLES.
4. FOR STOREFRONT DETAIL NOT SHOWN, SEE ELEVATION ON SHEET 1.
5. MULLION CONDITION, WHERE-BY DOORS ARE MULLED DIRECTLY NEXT TO DOORS, IS NOT COVERED UNDER THIS APPROVAL AND MUST BE EVALUATED SEPARATELY.

DRAWN BY: W.W.S.		CHECKED BY: W.W.S.	
PLOT: 1-24		DATE: 02/19/13	
DATE	BY	REVISION	DESCRIPTION
DRAWING TITLE TRIFAB 451/451T LARGE MISSILE IMPACT STOREFRONT SYSTEM			
JOB INFORMATION: KAMNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555			
CONSULTANTS W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) 7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424			
CERTIFICATION MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497			
DRAWING NO. 1726T		REV.	
SHEET NO. 2		OF 8	



EXTERIOR ELEVATION:
STORE FRONT ASSEMBLY WITH
DOUBLE DOOR (NO TRANSOM)
SCALE: 1/2"=1'-0"

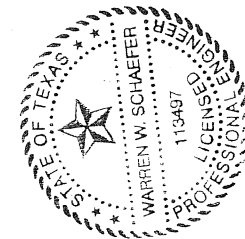
Diagram illustrating the dimensions and requirements for a door and pressure table assembly, showing three sections: SECTION 1, SECTION 2, and SECTION 3.

Dimensions and Requirements:

- Door Opening Width:** 48" MAX.
- Door Opening Height:** 96" MAX.
- Door Jamb Mullion Clip Screws:** 3 DOOR JAMB MULLION CLIP SCREWS WHERE SHOWN. SEE "FRAME ANCHOR REQUIREMENTS TABLE" ON SHEET 1 FOR SCREW REQUIREMENTS.
- Pressure Table:** 2" OR 4 1/2" VERTICAL MULLION PRESSURE TABLES" ON SHEET 4 FOR MAX. FRAME HEIGHT (N.I.E. 96").
- Door Centerline:** 7" EQ. (Equal) from the door jamb.
- Panel Centerline:** 7" EQ. (Equal) from the door jamb.
- Mullion Load Tables:** SEE MULLION LOAD TABLES FOR MAXIMUM MULLION "LOAD WIDTH".
- Impact Approval:** 350 IR LARGE MISSILE IMPACT OUT-SWING DOOR UNDER SEPERATE APPROVAL.
- Labels:** K/6, J/6, L/7, H/6.

EXTERIOR ELEVATION:
STORE FRONT ASSEMBLY WITH
SINGLE DOOR (NO TRANSOM)
SCALE: 1/2"=1'-0"

1. SIDELIGHTS AT ONE SIDE OF DOOR SHOWN. SIDELIGHTS MAY BE PLACED AT ONE OR BOTH SIDES OF DOORS.
2. HORIZONTAL STACKING & OVERALL UNIT WIDTH IS UNLIMITED PROVIDING FIXED PANEL D.L.O. DOES NOT EXCEED THAT SPECIFIED IN THE GLASS SIZE TABLE.
3. NUMBER OF GLASS PANELS STACKED VERTICALLY WITHIN IN ONE BAY IS UNLIMITED PROVIDING THE OVERALL FRAME HEIGHT DOES NOT EXCEED THAT ALLOWED IN THE MULLION LOAD TABLES.
4. FOR STOREFRONT DETAIL NOT SHOWN, SEE ELEVATION ON SHEET 1.
5. MULLION CONDITION, WHERE-BY DOORS ARE MULLED DIRECTLY NEXT TO DOORS, IS NOT COVERED UNDER THIS APPROVAL AND MUST BE EVALUATED SEPARATELY.

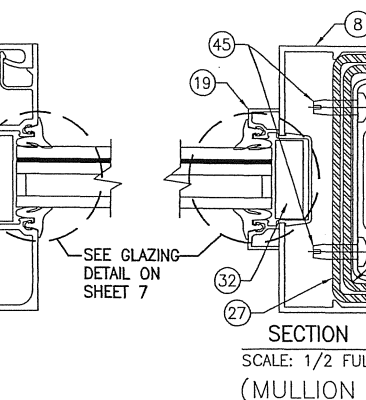
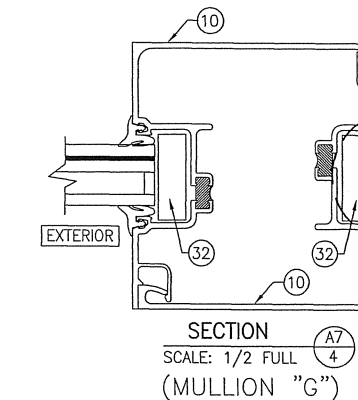
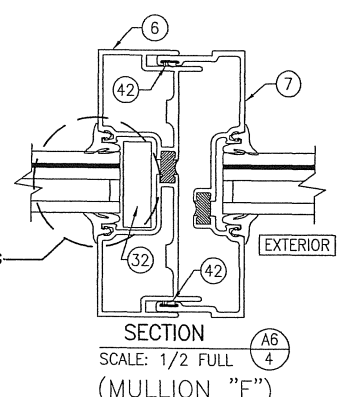
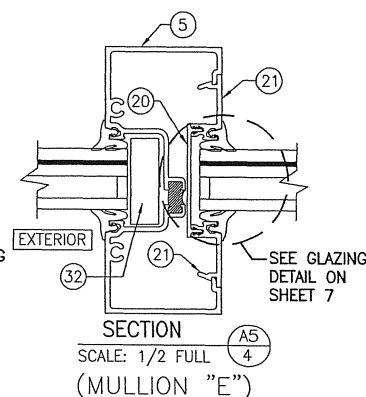
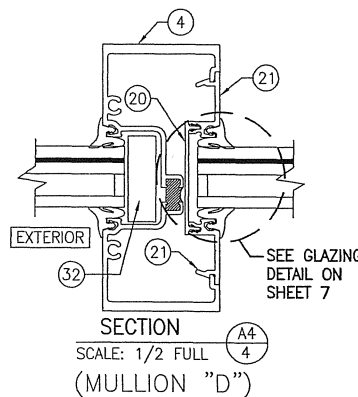
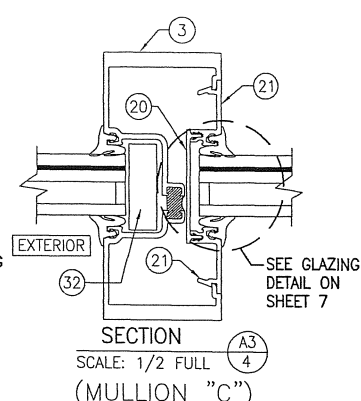
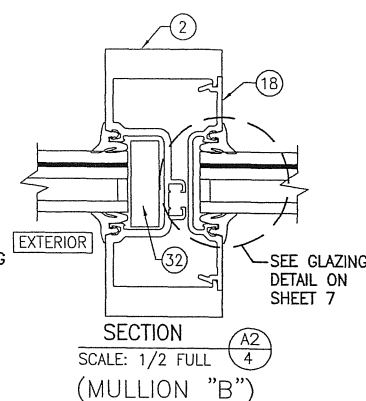
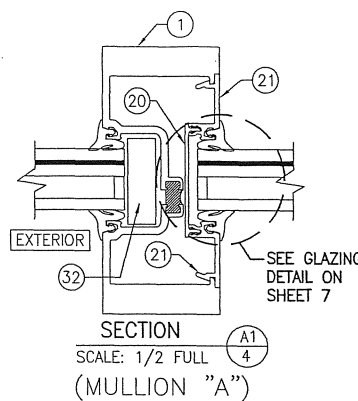


DRAWING NO. 1726T	SHEET NO. 3 OF 8	REV.	CERTIFICATION  MAR 20 2013 WAYNE P. SCHAEFER, P.E. P.E. NO. 113487	DRAWING TITLE TRIFAB 451/451T LARGE MISSILE IMPACT STOREFRONT SYSTEM	CONSULTANTS W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14960) 7480 130TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424	JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIIDGE COURT NORCROSS, GA 30092 770-449-5555	NO. REVISION DESCRIPTION BY DATE	PLOTTED BY: W.W.S. CHECKED BY: W.W.S. DATE: 03/19/13	DRAWN BY: W.W.S.

MULLION ALLOWABLE DESIGN PRESSURE

MAXIMUM MULLION SPAN (IN.)	MAXIMUM LOAD WIDTH (IN.)	ALLOWABLE PRESSURE (+/- PSF)						
		MULLION "A"	MULLION "B"	MULLION "C"	MULLION "D"	MULLION "E"	MULLION "F" & "G"	MULLION "H"
120	74	N/A	N/A	N/A	N/A	N/A	N/A	45.0
	50	35.0	45.0	23.0	20.0	N/A	N/A	45.0
	44	39.8	45.0	26.2	22.7	N/A	N/A	45.0
	38	45.0	45.0	30.3	26.3	N/A	N/A	45.0
	32	45.0	45.0	36.0	31.3	N/A	N/A	45.0
	26	45.0	45.0	44.3	38.5	N/A	N/A	45.0
108	20	45.0	45.0	45.0	45.0	N/A	N/A	45.0
	74	N/A	N/A	N/A	N/A	N/A	N/A	45.0
	50	38.9	45.0	31.6	22.2	N/A	N/A	45.0
	44	44.2	45.0	35.9	25.3	N/A	N/A	45.0
	38	45.0	45.0	41.6	29.2	N/A	N/A	45.0
	32	45.0	45.0	45.0	34.7	N/A	N/A	45.0
102	26	45.0	45.0	45.0	42.7	N/A	N/A	45.0
	20	45.0	45.0	45.0	45.0	N/A	N/A	45.0
	74	N/A	N/A	N/A	N/A	N/A	N/A	45.0
	50	41.2	45.0	37.5	23.5	N/A	N/A	45.0
	44	45.0	45.0	42.6	26.7	N/A	N/A	45.0
	38	45.0	45.0	45.0	31.0	N/A	N/A	45.0
96	32	45.0	45.0	45.0	36.8	N/A	N/A	45.0
	26	45.0	45.0	45.0	45.0	N/A	N/A	45.0
	20	45.0	45.0	45.0	45.0	N/A	N/A	45.0
	74	N/A	N/A	N/A	N/A	N/A	N/A	45.0
	50	43.8	45.0	45.0	25.0	30.0	45.0	45.0
	44	45.0	45.0	45.0	28.4	34.1	45.0	45.0
90	38	45.0	45.0	45.0	32.9	39.5	45.0	45.0
	32	45.0	45.0	45.0	39.1	45.0	45.0	45.0
	26	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	20	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	74	N/A	N/A	N/A	N/A	N/A	N/A	45.0
	50	45.0	45.0	45.0	26.7	32.0	45.0	45.0
84	44	45.0	45.0	45.0	30.3	36.4	45.0	45.0
	38	45.0	45.0	45.0	35.1	42.1	45.0	45.0
	32	45.0	45.0	45.0	41.7	45.0	45.0	45.0
	26	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	20	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	74	N/A	N/A	N/A	N/A	N/A	N/A	45.0
78	50	45.0	45.0	45.0	28.6	34.3	45.0	45.0
	44	45.0	45.0	45.0	32.5	39.0	45.0	45.0
	38	45.0	45.0	45.0	37.6	45.0	45.0	45.0
	32	45.0	45.0	45.0	44.6	45.0	45.0	45.0
	26	45.0	45.0	45.0	45.0	45.0	45.0	45.0
	20	45.0	45.0	45.0	45.0	45.0	45.0	45.0
72	74	45.0	45.0	45.0	30.8	36.9	45.0	N/A
	50	45.0	45.0	45.0	35.0	42.0	45.0	N/A
	44	45.0	45.0	45.0	40.5	45.0	45.0	N/A
	38	45.0	45.0	45.0	45.0	45.0	45.0	N/A
	32	45.0	45.0	45.0	45.0	45.0	45.0	N/A
	26	45.0	45.0	45.0	45.0	45.0	45.0	N/A
66	20	45.0	45.0	45.0	33.3	40.0	45.0	N/A
	74	45.0	45.0	45.0	37.9	45.0	45.0	N/A
	50	45.0	45.0	45.0	43.9	45.0	45.0	N/A
	44	45.0	45.0	45.0	45.0	45.0	45.0	N/A
	38	45.0	45.0	45.0	45.0	45.0	45.0	N/A
	32	45.0	45.0	45.0	45.0	45.0	45.0	N/A
60	26	45.0	45.0	45.0	36.4	43.6	45.0	N/A
	20	45.0	45.0	45.0	41.3	45.0	45.0	N/A
	74	45.0	45.0	45.0	45.0	45.0	45.0	N/A
	50	45.0	45.0	45.0	45.0	45.0	45.0	N/A
	44	45.0	45.0	45.0	45.0	45.0	45.0	N/A
	38	45.0	45.0	45.0	45.0	45.0	45.0	N/A
54	32	45.0	45.0	45.0	40.0	45.0	45.0	N/A
	26	45.0	45.0	45.0	44.4	45.0	45.0	N/A
	20	45.0	45.0	45.0	45.0	45.0	45.0	N/A
	74	45.0	45.0	45.0	45.0	45.0	45.0	N/A
	50	45.0	45.0	45.0	45.0	45.0	45.0	N/A
	44	45.0	45.0	45.0	45.0	45.0	45.0	N/A

- NOTES: 1. SEE ELEVATIONS FOR DIMENSIONING OF LOAD WIDTH.
2. SEE SECTIONS A THROUGH H FOR DETAIL OF MULLIONS.
3. "N/A" DESIGNATES A SIZE NOT APPLICABLE TO THAT MULLION CONDITION.



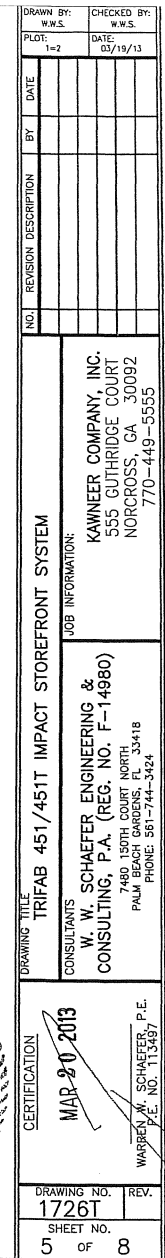
UNKNOWN BY: W.W.S.		CHECKED BY: W.W.S.	
PLOT: 1-2		DATE: 03/19/13	
DATE	BY	REVISION	DESCRIPTION
DRAWING TITLE: TRIFAB 451/451T IMPACT STOREFRONT SYSTEM		JOB INFORMATION:	
CONSULTANTS: W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980)		KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555	
CERTIFICATION: MAR 20 2013		WARREN W. SCHAEFER, P.E. REG. NO. 113497	
DRAWING NO. 1726T		REV.	
SHEET NO. 4		OF 8	

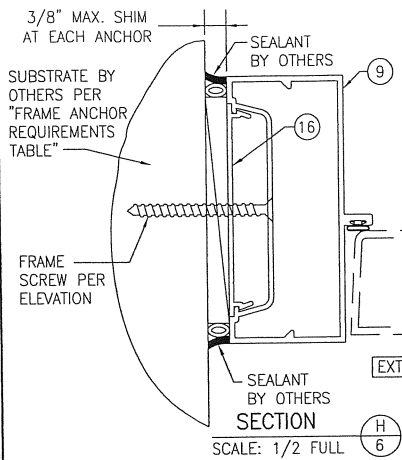

$$\left(\frac{B}{E} \right)$$

$$\left(\frac{C}{E} \right)$$

$$\left(\frac{EI}{5} \right)$$


EXTERIOR

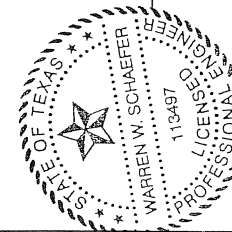
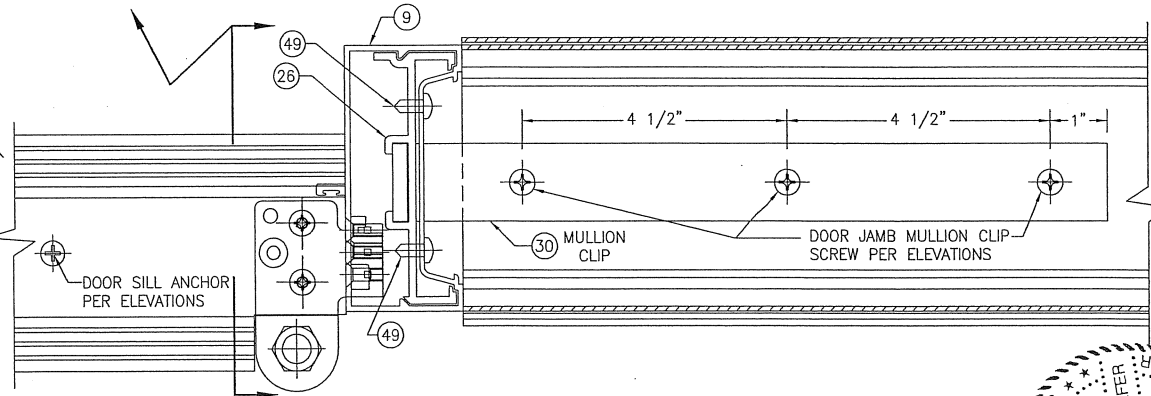
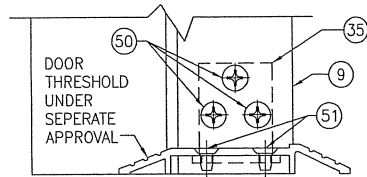
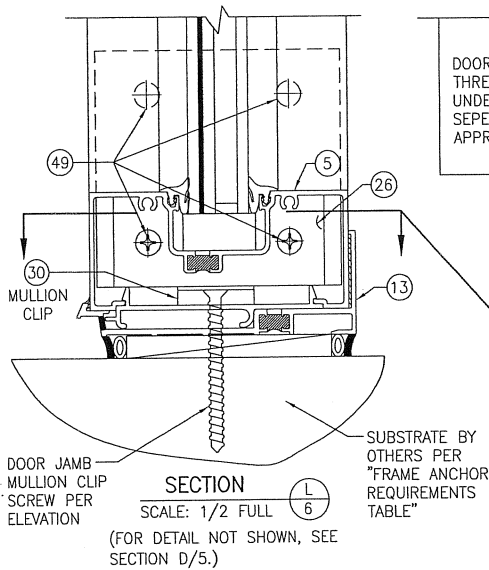
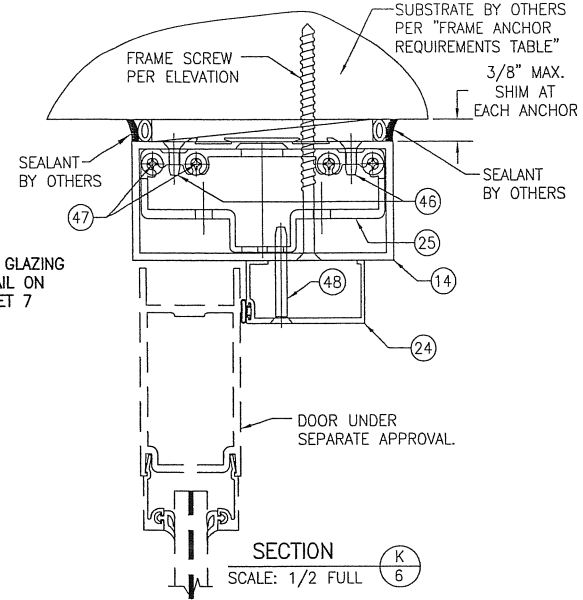
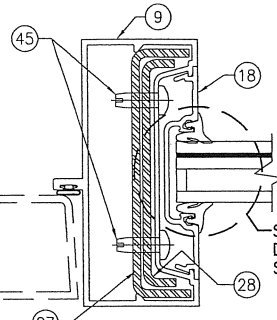
$$\left(\frac{G}{F} \right)$$




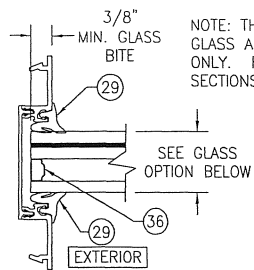
DOOR UNDER SEPERATE APPROVAL.

SECTION J 6

SCALE: 1/2 FULL



DRAWING TITLE		TRIFAB 451/451T IMPACT STOREFRONT SYSTEM	
CONSULTANTS	W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980)	JOB INFORMATION:	
KAWNEER COMPANY, INC.		555 GUTHRIE COURT	
NORCROSS, GA 30092		770-449-5555	
WARREN W. SCHAEFER, P.E.		P.E. NO. 113497	
CERTIFICATION	MAR 20 2013	DRAWING NO.	1726T
SHEET NO.		6	OF 8



NOTE: THIS GLAZING DETAIL SPECIFIES THE GLASS AND GLAZING GASKET REQUIREMENTS ONLY. FOR SHIMS & OTHER PARTS, SEE SECTIONS.

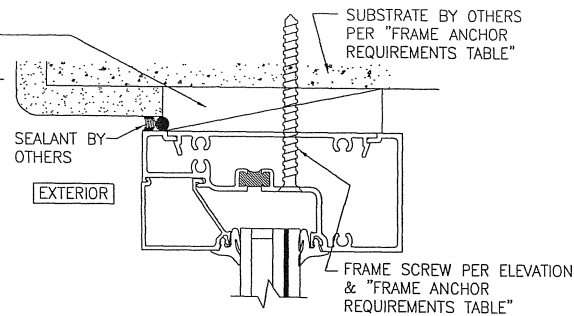
NOTE: EXTERIOR GLASS PANE OF I.G. GLAZING SHALL BE TEMPERED WHEN CURTAIN WALL GLASS IS INSTALLED IN A SMALL MISSILE IMPACT LOCATION OF A BUILDING OR WHEN GLASS IS REQUIRED TO BE SAFETY GLAZED.

GLAZING DETAIL
SCALE: 1/2 FULL

GLASS OPTIONS:

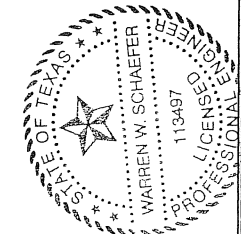
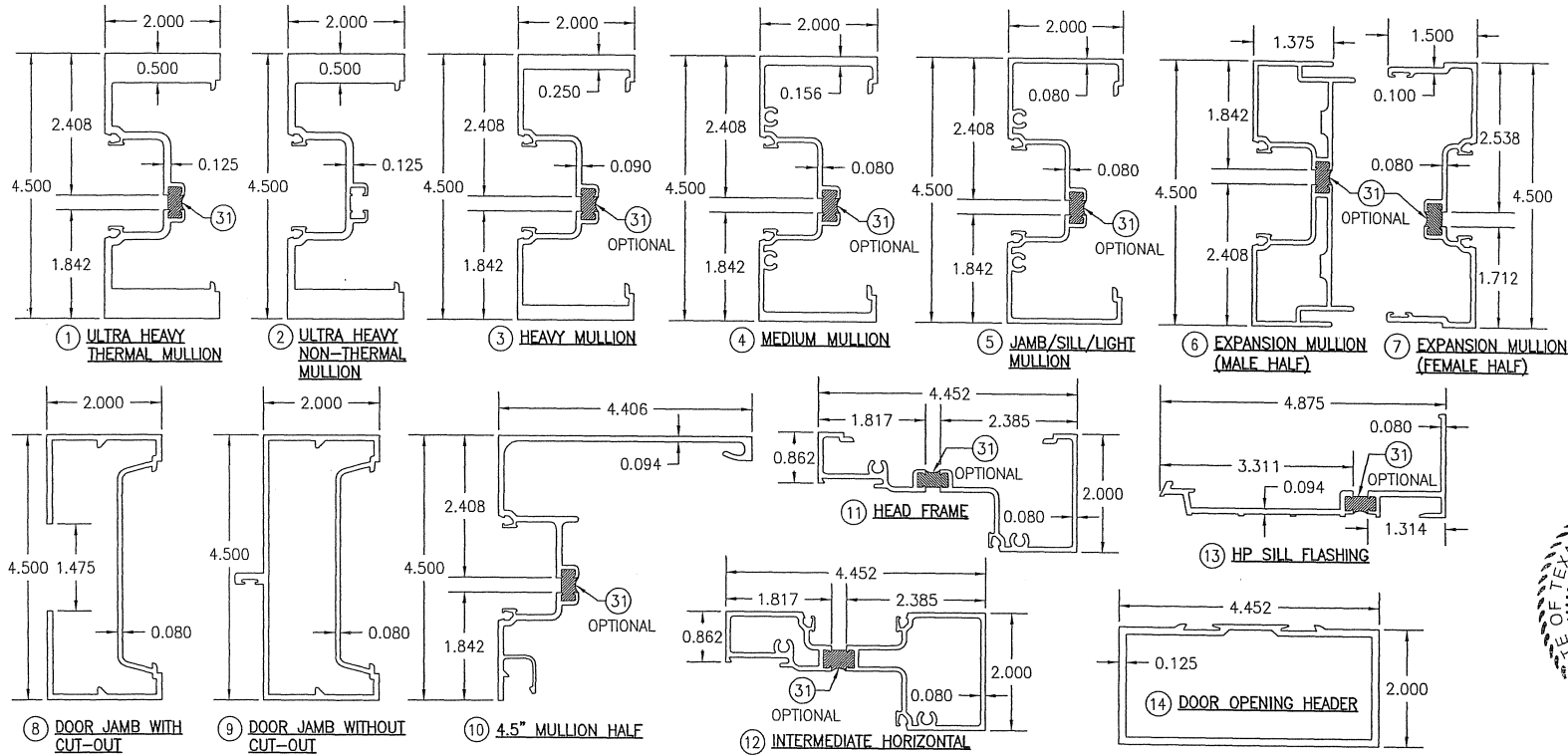
OPTION 1) 1 1/32" I.G. GLASS WITH 3/16" HS OUTBOARD, 3/8" AIR SPACE & LAMINATED 3/16" HS/0.09" DUPONT SG/3/16" HS INBOARD
OPTION 2) 1 1/32" I.G. GLASS WITH 3/16" TEMPERED OUTBOARD, 3/8" AIR SPACE & LAMINATED 3/16" HS/0.09" DUPONT SG/3/16" HS INBOARD

CONTINUOUS WOOD MEMBER LESS IN THICKNESS THAN A 2X- BUCK TO BE MIN. 4" DEEP (NOT REQUIRED WHEN SHIM SPACE IS WITHIN ALLOWABLE DIMENSIONS SHOWN IN SECTIONS).



**OPTIONAL DIRECT MOUNT DETAIL
TO SUBSTRATE WITH SPACER**

(HEAD SECTION SHOWN; SILL & SIDES ARE INSTALLED THE SAME)
(FOR DETAIL NOT SHOWN, SEE OTHER SECTIONS)



DATE	DATE
BY	DATE
REVISION DESCRIPTION	DATE
NO.	DATE
DRAWING TITLE TRIFAB 451/451T IMPACT STOREFRONT SYSTEM	
CONSULTANTS W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14960) 7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE 561-744-3424	
JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555	
CERTIFICATION MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497	
DRAWING NO. 1726T	REV.
SHEET NO. 7	OF 8



Hurricane Resistant Product



Blast Mitigation Product

Features

- 350 IR medium stile has 3-1/2" (88.9) vertical stiles, 3-1/2" (88.9) top and 6-1/2" (165.1) bottom rails
- 500 IR wide stile has 5" (127) vertical stile, 5" (127) top and 6-1/2" (165.1) bottom rail.
- Door is 1-3/4" (44.5) deep
- Dual moment welded corner construction
- Single acting
- Square stops for 9/16" (14.3) or 1" (25.4) glazing infill for use with Kuraray SentryGlas® dry glazing
- Offset pivots, butt hinges or continuous geared hinge
- MS locks and 3-point locks or exit device hardware
- Surface mounted or concealed closers
- Architects Classic push/pulls
- Adjustable astragal utilizing pile weathering with polymeric fin at meeting stiles
- Polymeric bulb weatherstripping in door frames
- Permanodic™ anodized finishes in seven choices
- Painted finishes in standard and custom choices

Optional Features

- Paneline™ / Paneline™ EL exit device (Hurricane Resistant applications only)
- Square stops with interior silicone seal for 9/16" (14.3) glazing infill
- Square stops with 3M® VHB interior tape for 9/16" (14.3) or 1" (25.4) glazing infill
- Variety of bottom rails and horizontal cross rails

Product Applications

- 350 IR medium stile and 500 IR wide stile provides extra strength for schools, institutions and other high traffic applications where codes require wind borne debris protection or blast mitigation protection

For specific product applications,
Consult your Kawneer representative.

Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

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ENTRANCE HARDWARE OFFERINGS	18-20

LAWS AND BUILDING AND SAFETY CODES GOVERNING THE DESIGN AND USE OF GLAZED ENTRANCE, WINDOW, AND CURTAIN WALL PRODUCTS VARY WIDELY. KAWNEER DOES NOT CONTROL THE SELECTION OF PRODUCT CONFIGURATIONS, OPERATING HARDWARE, OR GLAZING MATERIALS, AND ASSUMES NO RESPONSIBILITY THEREFOR.

Metric (SI) conversion figures are included throughout these details for reference. Numbers in parentheses () are millimeters unless otherwise noted.

The following metric (SI) units are found in these details:

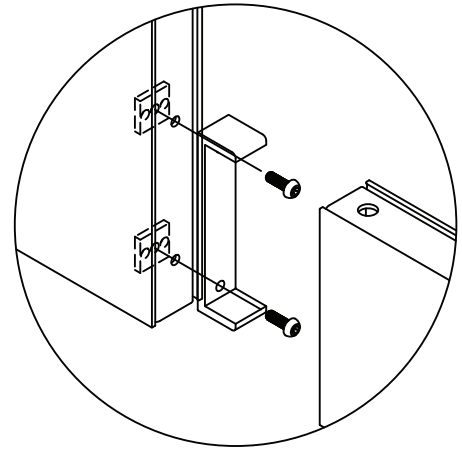
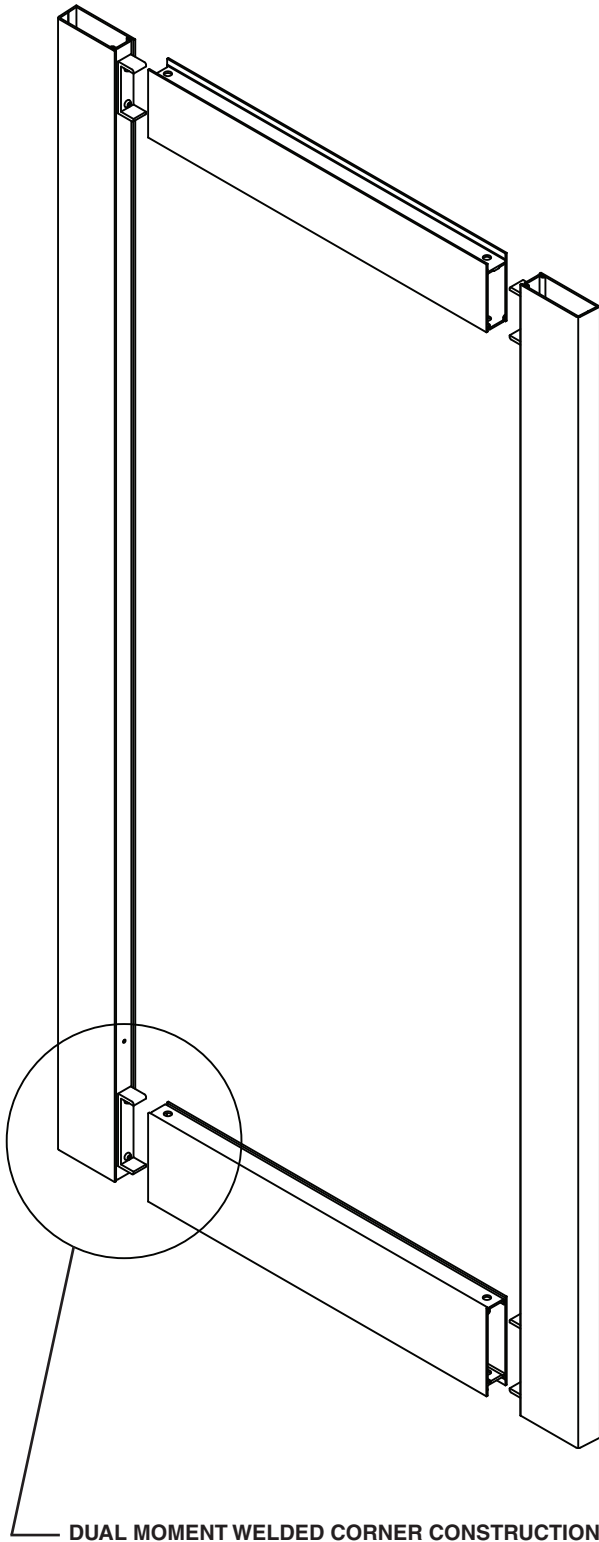
m – meter
 cm – centimeter
 mm – millimeter
 s – second
 Pa – pascal
 MPa – megapascal

Kawneer reserves the right to change configurations without prior notice when deemed necessary for product improvement.

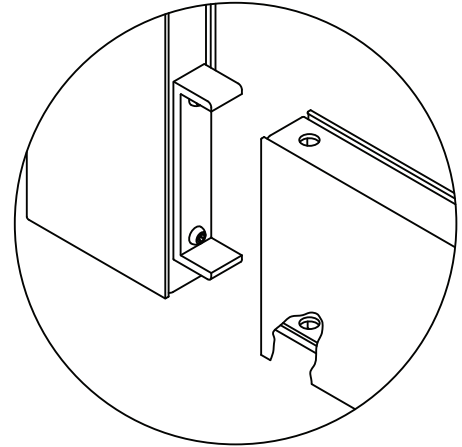
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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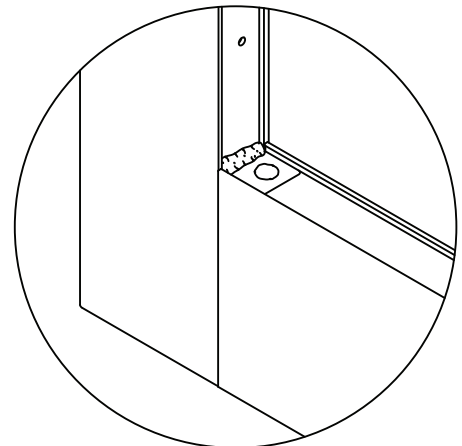
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#1 MECHANICAL FASTENING is accomplished by attaching a 5/16" (7.9) thick extruded aluminum channel clip to the vertical stile with 1/4"-20 heat strengthened bolts and 3/16" thick steel nut plates for a high strength welding base for attachment horizontal member.



#2 SIGMA* DEEP PENETRATION PLUG WELDS are made top and bottom after the horizontal is properly positioned over the channel clip to help provide the strongest door corner joint currently available.



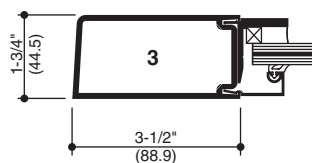
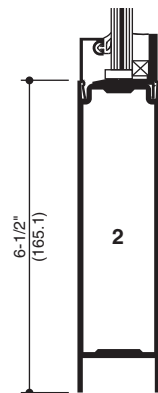
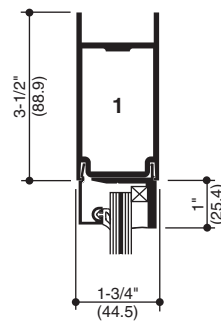
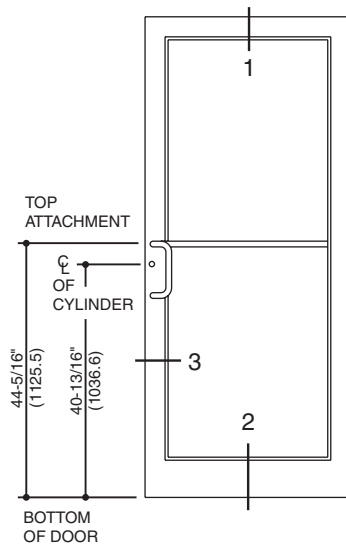
#3 SIGMA* FILLET WELDS along both top and bottom webs of the rail extrusion complete the welded corner construction.

* An arc welding process known as Shielded Inert Gas Metal Arc (SIGMA) or also known as Metal Inert Gas (MIG).



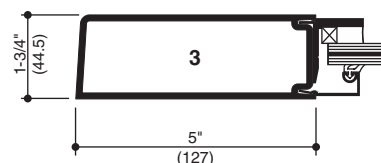
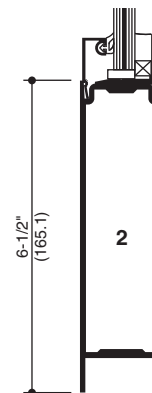
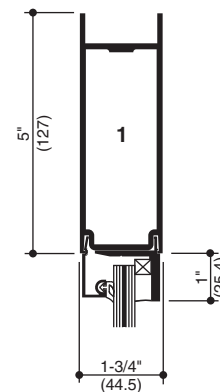
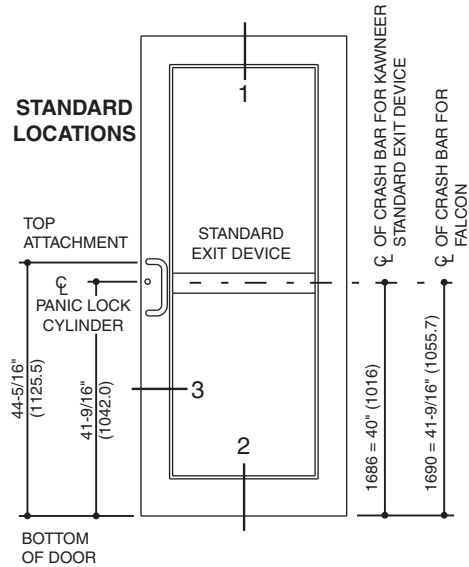
SCALE 3" = 1' 0"

350 IR MEDIUM STILE



SINGLE ACTING

500 IR WIDE STILE



SINGLE ACTING

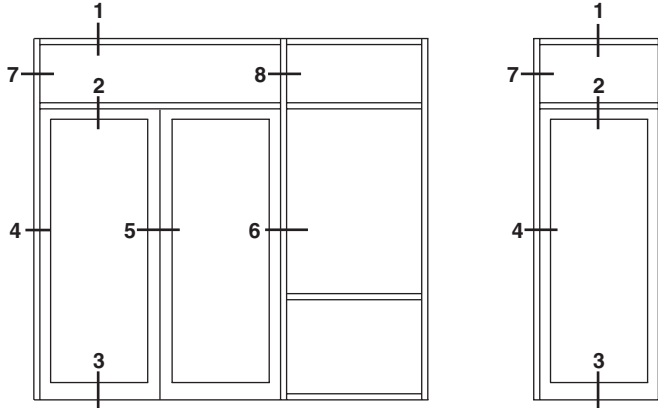
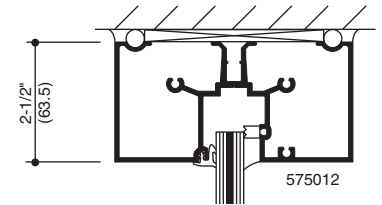
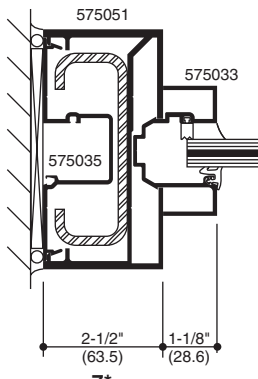
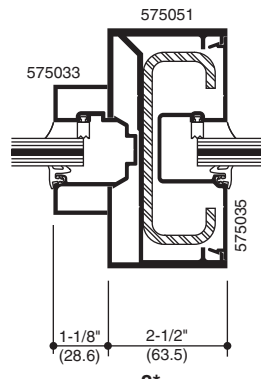
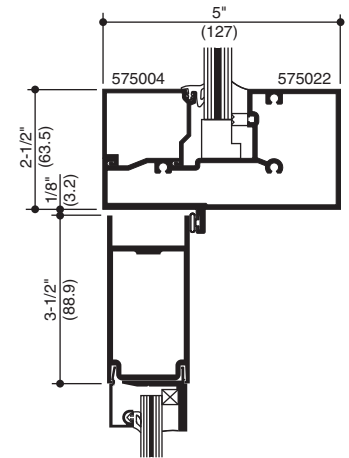
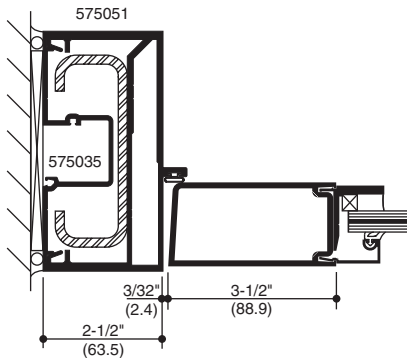
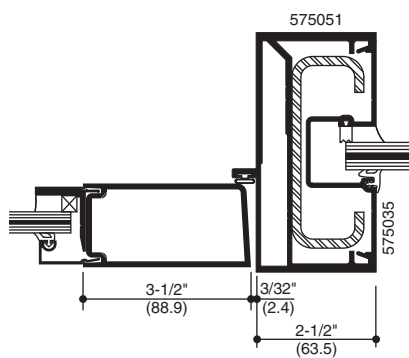
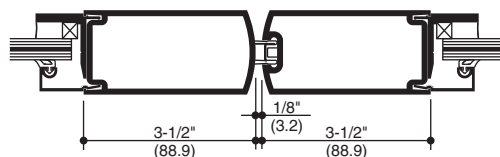
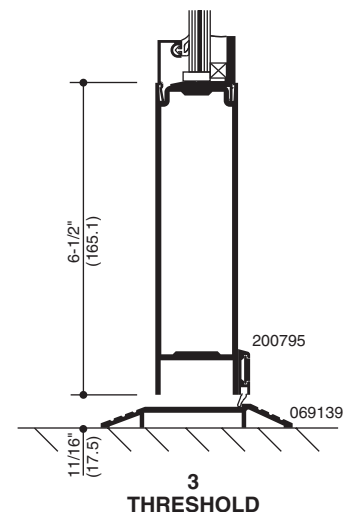
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SCALE 3" = 1'-0"**NOTE:**

1. 350 IR MEDIUM STILE DOORS ARE DETAILED. 500 IR WIDE STILE DOORS MAY ALSO BE USED.
2. IR 500 FRAMING WITH 9/16" (14.3) GLAZING IS DETAILED WITH THESE DOORS FOR REFERENCE. OTHER GLAZING INFILLS MAY BE USED WITH THE IR 500 SERIES FRAMING. SEE CATALOG SECTION IR 500/501 FRAMING FOR APPROPRIATE DETAILS.

**ELEVATION IS NUMBER KEYED TO DETAILS****1
TRANSOM HEAD****7*
DOOR JAMB
AT TRANSOM****8*
DOOR JAMB
AT TRANSOM****2
DOOR WITH TRANSOM****4
DOOR JAMB****6
DOOR JAMB****5
PAIR OF DOORS****3
THRESHOLD**

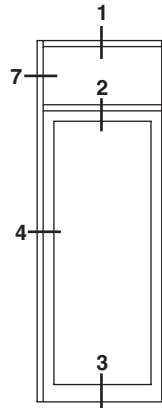
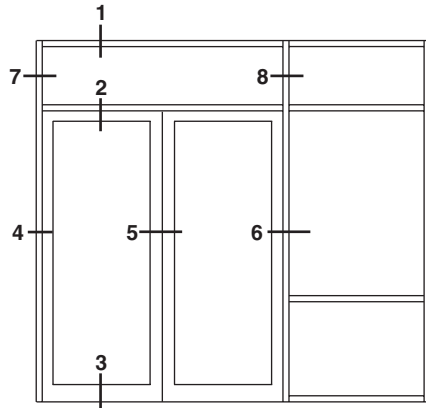
* STEEL REINFORCING AS REQUIRED.



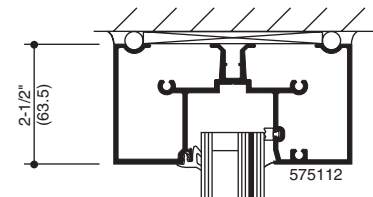
SCALE 3" = 1'-0"

NOTE:

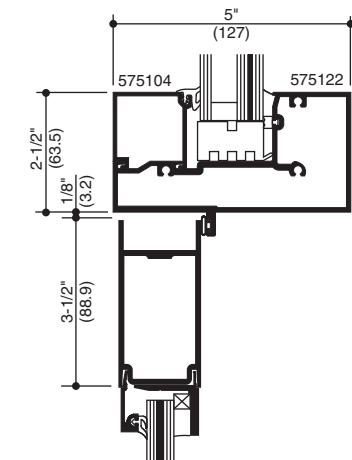
1. 350 IR MEDIUM STILE DOORS ARE DETAILED. 500 IR WIDE STILE DOORS MAY ALSO BE USED.
2. IR 501 FRAMING WITH 1-5/16" (33.3) GLAZING IS DETAILED WITH THESE DOORS FOR REFERENCE. OTHER GLAZING INFILLS MAY BE USED WITH THE IR 501 SERIES FRAMING. SEE CATALOG SECTION IR 500/501 FRAMING FOR APPROPRIATE DETAILS.



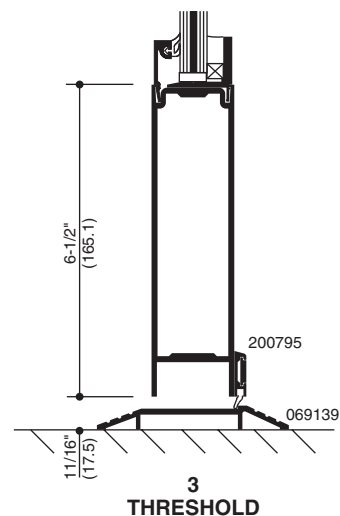
ELEVATION IS NUMBER KEYED TO DETAILS



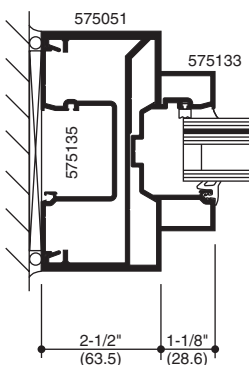
**1
TRANSOM HEAD**



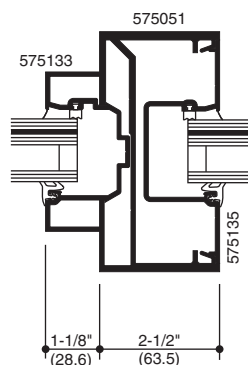
**2
DOOR WITH TRANSOM**



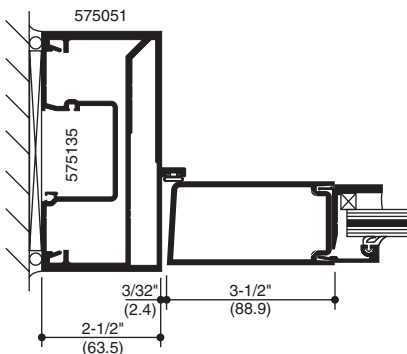
**3
THRESHOLD**



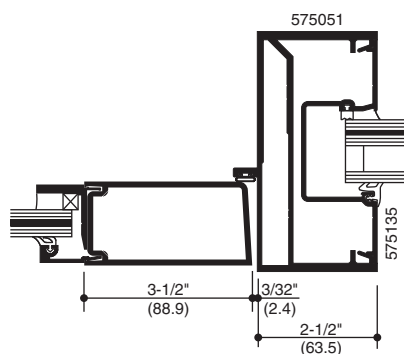
**4
DOOR JAMB
AT TRANSOM**



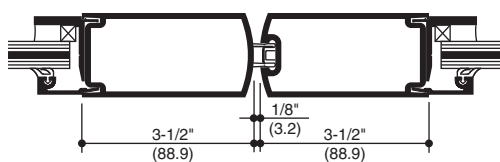
**5
DOOR JAMB
AT TRANSOM**



**6
DOOR JAMB**



**7
DOOR JAMB**



**8
PAIR OF DOORS**

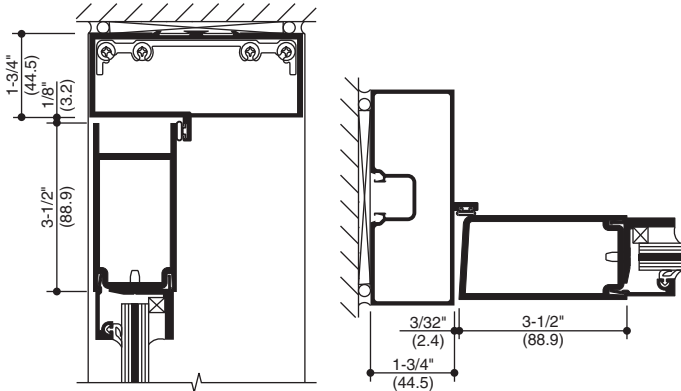
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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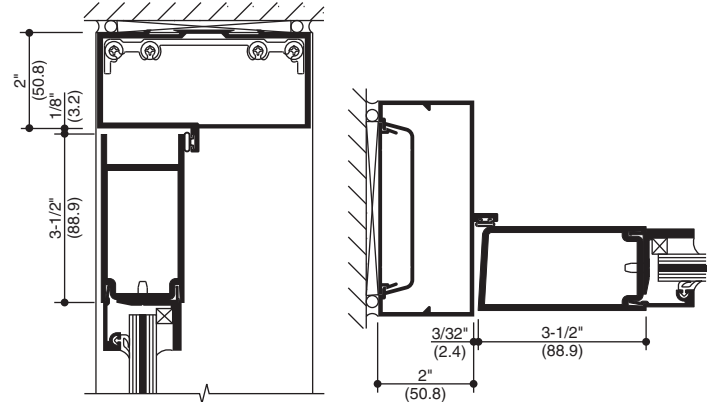
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SCALE 3" = 1'-0"

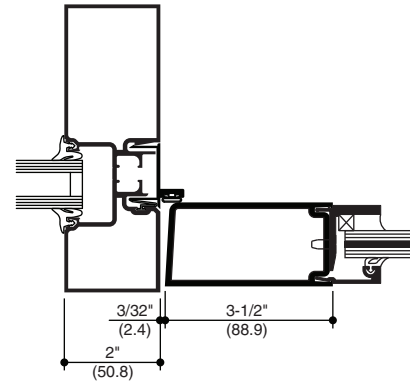
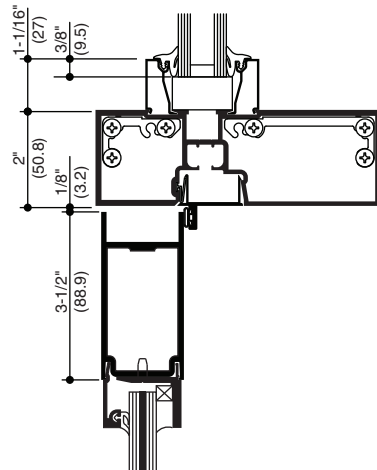
TRIFAB™ VG 450 FRAMING



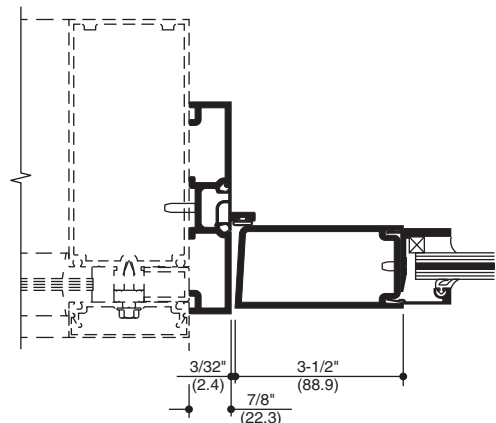
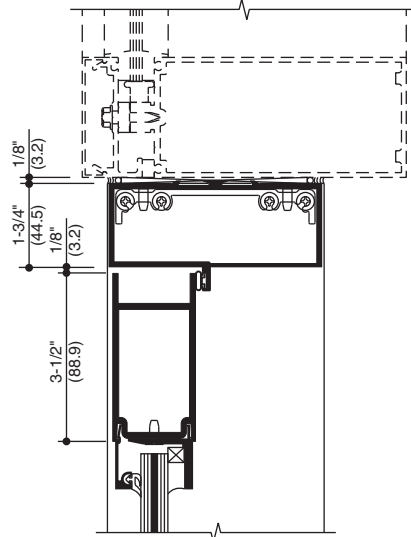
TRIFAB™ VG 451 FRAMING



TRIFAB™ 601 FRAMING



1600 WALL SUB FRAMING



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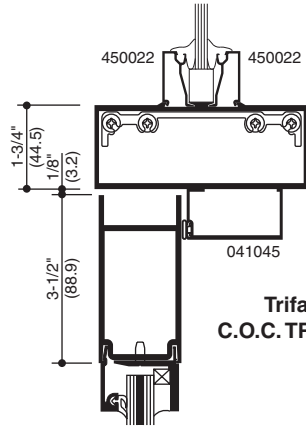
© Kawneer Company, Inc., 2014

FRAMING OPTIONS

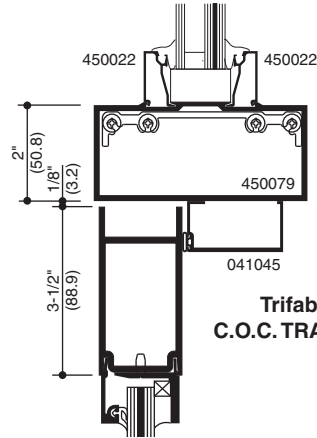
EC 97911-083

 Hurricane Resistant Product

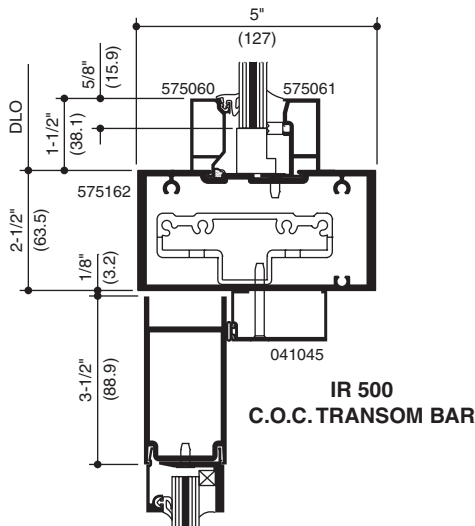
SCALE 3" = 1' - 0"



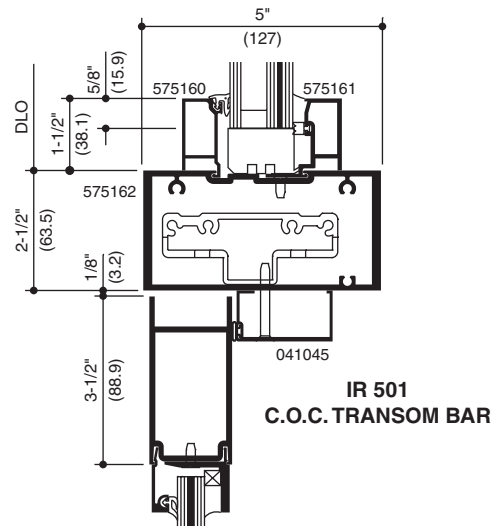
Trifab VG 450
C.O.C. TRANSOM BAR



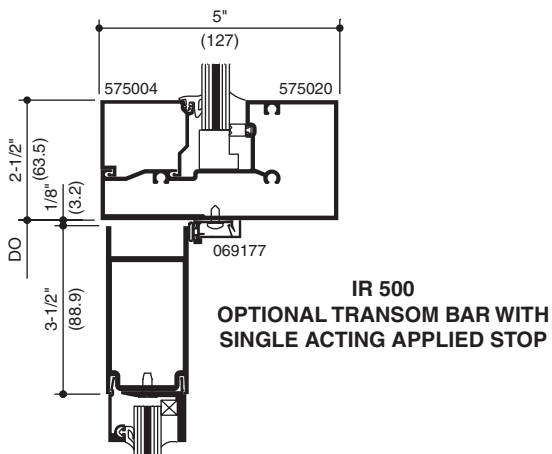
Trifab VG 451
C.O.C. TRANSOM BAR



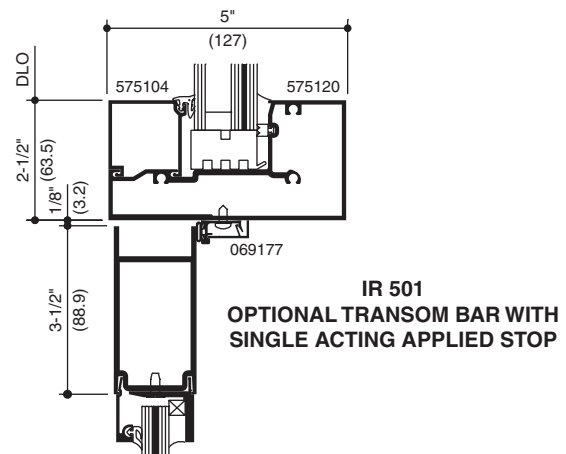
IR 500
C.O.C. TRANSOM BAR



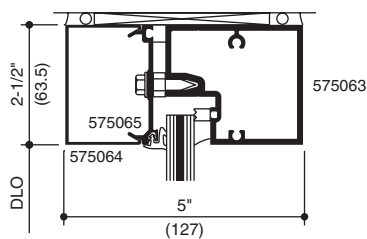
IR 501
C.O.C. TRANSOM BAR



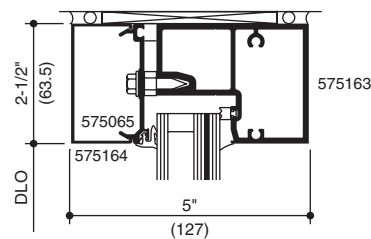
IR 500
OPTIONAL TRANSOM BAR WITH
SINGLE ACTING APPLIED STOP



IR 501
OPTIONAL TRANSOM BAR WITH
SINGLE ACTING APPLIED STOP



IR 500 RADIUS HEAD



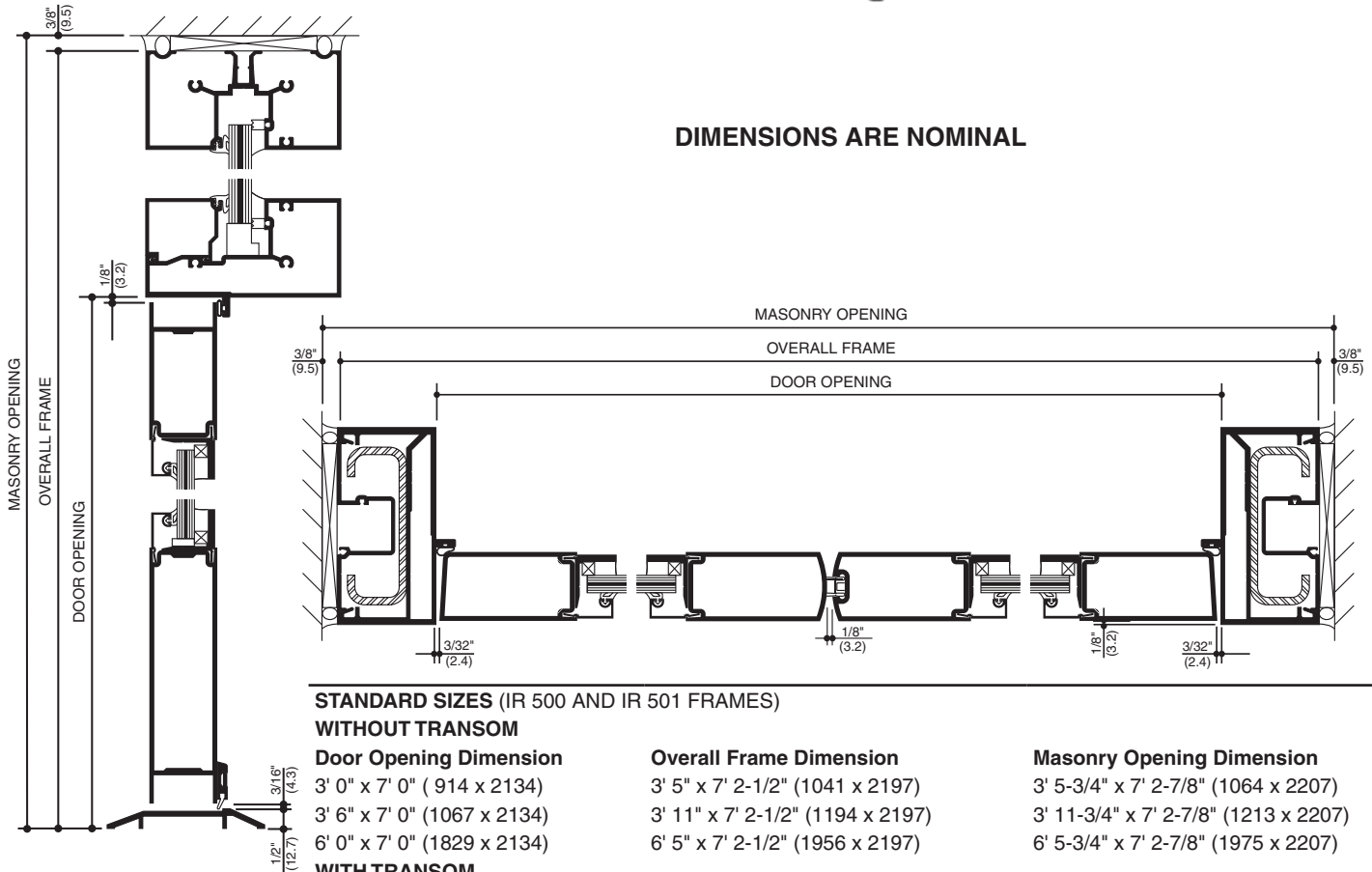
IR 501 RADIUS HEAD

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SCALE 3" = 1' 0"

**STANDARD SIZES (IR 500 AND IR 501 FRAMES)****WITHOUT TRANSOM****Door Opening Dimension**

3' 0" x 7' 0" (914 x 2134)

3' 6" x 7' 0" (1067 x 2134)

6' 0" x 7' 0" (1829 x 2134)

Overall Frame Dimension

3' 5" x 7' 2-1/2" (1041 x 2197)

3' 11" x 7' 2-1/2" (1194 x 2197)

6' 5" x 7' 2-1/2" (1956 x 2197)

Masonry Opening Dimension

3' 5-3/4" x 7' 2-7/8" (1064 x 2207)

3' 11-3/4" x 7' 2-7/8" (1213 x 2207)

6' 5-3/4" x 7' 2-7/8" (1975 x 2207)

WITH TRANSOM**Door Opening Dimension**

Unchanged from above.

Masonry Opening Dimension

Add 3' 2-1/2" (978) to above heights.

Masonry Opening Dimension

Add 3' 2-1/2" (978) to above heights.

STANDARD SIZES (TRIFAB™ VG 450 CENTER FRAMES)**WITHOUT TRANSOM****Door Opening Dimension**

3' 0" x 7' 0" (914 x 2134)

3' 6" x 7' 0" (1067 x 2134)

6' 0" x 7' 0" (1829 x 2134)

Overall Frame Dimension

3' 3-1/2" x 7' 1-3/4" (1003 x 2178)

3' 9-1/2" x 7' 1-3/4" (1156 x 2178)

6' 3-1/2" x 7' 1-3/4" (1918 x 2178)

Masonry Opening Dimension

3' 4-1/4" x 7' 2-1/8" (1022 x 2188)

3' 10-1/4" x 7' 2-1/8" (1175 x 2188)

6' 4-1/4" x 7' 2-1/8" (1937 x 2188)

WITH TRANSOM**Door Opening Dimension**

Unchanged from above.

Masonry Opening Dimension

Add 3' 1-3/4" (959) to above heights.

Masonry Opening Dimension

Add 3' 1-3/4" (959) to above heights.

STANDARD SIZES (TRIFAB™ VG 451, AND TRIFAB™ 601 CENTER FRAMES)**WITHOUT TRANSOM****Door Opening Dimension**

3' 0" x 7' 0" (914 x 2134)

3' 6" x 7' 0" (1067 x 2134)

6' 0" x 7' 0" (1829 x 2134)

Overall Frame Dimension

3' 4" x 7' 2" (1016 x 2184)

3' 10" x 7' 2" (1168 x 2184)

6' 4" x 7' 2" (1930 x 2184)

Masonry Opening Dimension

3' 4-3/4" x 7' 2-3/8" (1035 x 2194)

3' 10-3/4" x 7' 2-3/8" (1187 x 2194)

6' 4-3/4" x 7' 2-3/8" (1949 x 2194)

WITH TRANSOM**Door Opening Dimension**

Unchanged from above.

Masonry Opening Dimension

Add 3' 2" (965) to above heights.

Masonry Opening Dimension

Add 3' 2" (965) to above heights.

STANDARD SIZES (1600 WALL SUB FRAMES)**WITHOUT TRANSOM****Door Opening Dimension**

3' 0" x 7' 0" (914 x 2134)

3' 6" x 7' 0" (1067 x 2134)

6' 0" x 7' 0" (1829 x 2134)

Overall Frame Dimension

3' 6-3/4" x 7' 4-3/8" (1086 x 2245)

4' 3/4" x 7' 4-3/8" (1238 x 2245)

6' 6-3/4" x 7' 4-3/8" (2000 x 2245)

Masonry Opening Dimension

3' 7-3/4" x 7' 4-7/8" (1111 x 2257)

4' 1-3/4" x 7' 4-7/8" (1264 x 2257)

6' 7-3/4" x 7' 4-7/8" (2026 x 2257)

WITH TRANSOM**Door Opening Dimension**

Unchanged from above.

Masonry Opening Dimension

Add 3' 2-1/2" (978) to above heights.

Masonry Opening Dimension

Add 3' 2-1/2" (978) to above heights.

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LOCKING OPTIONS	MAXIMUM DOOR SIZE	MAXIMUM DESIGN PRESSURE	HINGING OPTIONS	GLAZING STOP OPTIONS	GLASS THICKNESS
4 MS 1850 3-Point Lock (Active leaf) Flushbolts (Inactive leaf)	Single 4'-0" x 8'-0" (1219.2 x 2438.4) Pair 8'-0" x 8'-0" (2438.4 x 2438.4)	± 70 PSF	Offset Pivots Butt Hinges Continuous Hinge	1, 2, 3	9/16" (14.3)
	Single 3'-6" x 7'-0" (1066.8 x 2133.6)	± 90 PSF		2, 3	1" (25.4)
MS 1850 3-Point Lock (Active leaf) Adams Rite 2180 2 Point Dead Lock (Inactive leaf)	Single 4'-0" x 8'-0" (1219.2 x 2438.4) Pair 8'-0" x 8'-0" (2438.4 x 2438.4)	± 90 PSF	Offset Pivots Butt Hinges Continuous Hinge	1, 2, 3	9/16" (14.3)
				2, 3	1" (25.4)
4 Kawneer 1686 Concealed Rod Exit Device (EL option)	Single 4'-0" x 8'-0" (1219.2 x 2438.4) Pair 8'-0" x 8'-0" (2438.4 x 2438.4)	± 90 PSF	Offset Pivots Butt Hinges Continuous Hinge	1, 2, 3	9/16" (14.3)
				2, 3	1" (25.4)
Paneline™ Concealed Rod Exit Device (EL option)	Single 4'-0" x 8'-0" (1219.2 x 2438.4) Pair 8'-0" x 8'-0" (2438.4 x 2438.4)	± 70 PSF	Offset Pivots Butt Hinges Continuous Hinge	1, 2, 3	9/16" (14.3)
				2, 3	1" (25.4)
Adams Rite G86 Concealed Rod Exit Device	Single 4'-0" x 8'-0" (1219.2 x 2438.4) Pair 8'-0" x 8'-0" (2438.4 x 2438.4)	± 70 PSF	Offset Pivots Butt Hinges Continuous Hinge	1, 2, 3	9/16" (14.3)
				2, 3	1" (25.4)
Calibre 9100 Concealed Rod Exit Device	Single 4'-0" x 8'-0" (1219.2 x 2438.4) Pair 8'-0" x 8'-0" (2438.4 x 2438.4)	± 70 PSF	Offset Pivots Butt Hinges Continuous Hinge	1, 2, 3	9/16" (14.3)
				2, 3	1" (25.4)
4 Falcon HH1690 Concealed Rod Exit Device (EL option)	Single 4'-0" x 8'-0" (1219.2 x 2438.4) Pair 8'-0" x 8'-0" (2438.4 x 2438.4)	± 65 PSF	Offset Pivots Butt Hinges Continuous Hinge	1, 2, 3	9/16" (14.3)
				2, 3	1" (25.4)
Jackson 2086 Concealed Rod Exit Device	Single 4'-0" x 8'-0" (1219.2 x 2438.4) Pair 8'-0" x 8'-0" (2438.4 x 2438.4)	± 90 PSF	Offset Pivots Butt Hinges Continuous Hinge	1, 2, 3	9/16" (14.3)
				2, 3	1" (25.4)
Sargent AD8400 Concealed Rod Exit Device	Single 4'-0" x 8'-0" (1219.2 x 2438.4) Pair 8'-0" x 8'-0" (2438.4 x 2438.4)	± 65 PSF	Offset Pivots Butt Hinges Continuous Hinge	1, 2, 3	9/16" (14.3)
				2, 3	1" (25.4)
4 Von Duprin HH9947 Concealed Rod Exit Device	Single 4'-0" x 8'-0" (1219.2 x 2438.4) Pair 8'-0" x 8'-0" (2438.4 x 2438.4)	± 65 PSF	Offset Pivots Butt Hinges Continuous Hinge	1, 2, 3	9/16" (14.3)
				2, 3	1" (25.4)
Von Duprin 98/99 XP Concealed Rod Exit Device	Single 3'-6" x 7'-6" (1066.8 x 2286) Pair 7'-0" x 7'-6" (2133.6 x 2286)	± 50 PSF (Zone 3 only)	Offset Pivots Butt Hinges Continuous Hinge	1, 2, 3	9/16" (14.3)
				2, 3	1" (25.4)
Corbin Russwin ED5200SA Rim Device	Single 4'-0" x 8'-0" (1219.2 x 2438.4) Pair 8'-0" x 8'-0" (2438.4 x 2438.4)	± 50 PSF	Offset Pivots Butt Hinges Continuous Hinge	1, 2, 3	9/16" (14.3)
				2, 3	1" (25.4)

Glazing Stop Options:

- 1 - Structural silicone with 0.090 Kuraray or Eastman PVB inter layer or 0.090 Kuraray Sentry Glas® inter layer.
- 2 - 3M VHB structural tape with 0.090 Kuraray or Eastman PVB inter layer or 0.090 Kuraray Sentry Glas® inter layer.
- 3 - Dry glazing gasket with 0.090 Kuraray Sentry Glas® inter layer, only for 9/16" (14.3) infill with design pressure < or = 90 PSF.
- 4 - Available in 6'-0" x 9'-0" pairs.

Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

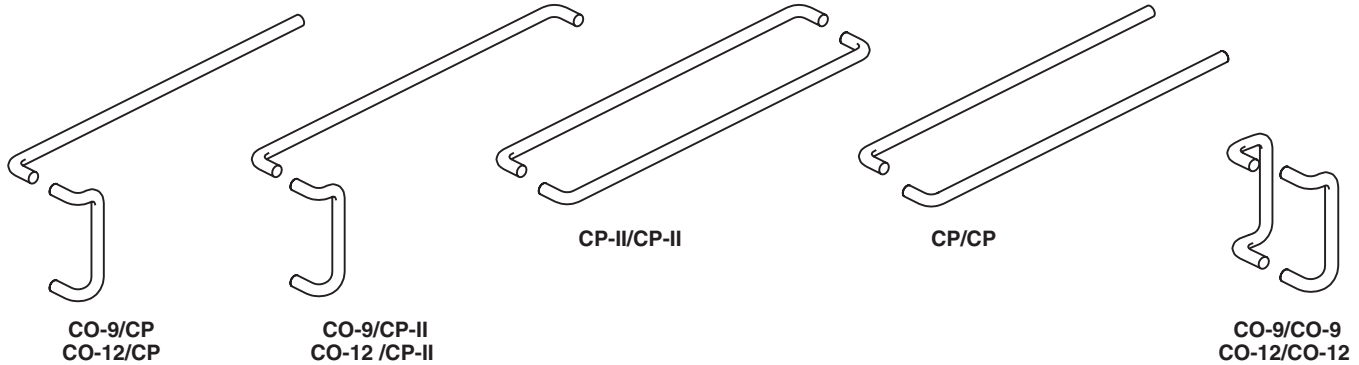
Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

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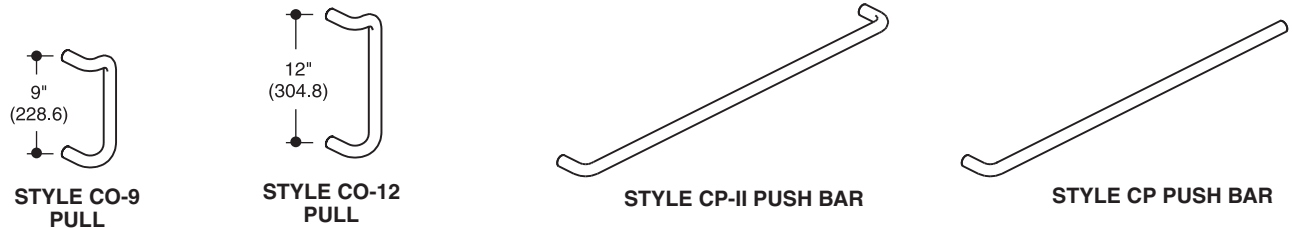
REFER TO **HARDWARE SECTION** FOR COMPLETE HARDWARE INFORMATION.

ARCHITECTS CLASSIC (PUSH PULL SETS)

SINGLE ACTING DOORS USE A PULL HANDLE AND PUSH BAR AS STANDARD

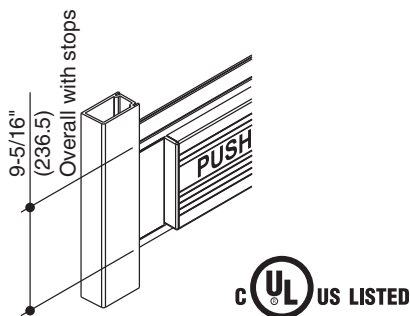


ARCHITECTS CLASSIC (COMPONENTS)

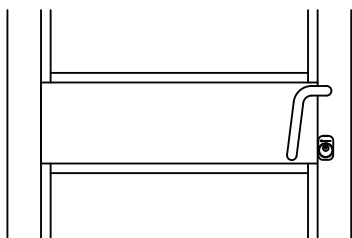


EXIT DEVICES

KAWNEER PANELINE™ / PANELINE™ EL



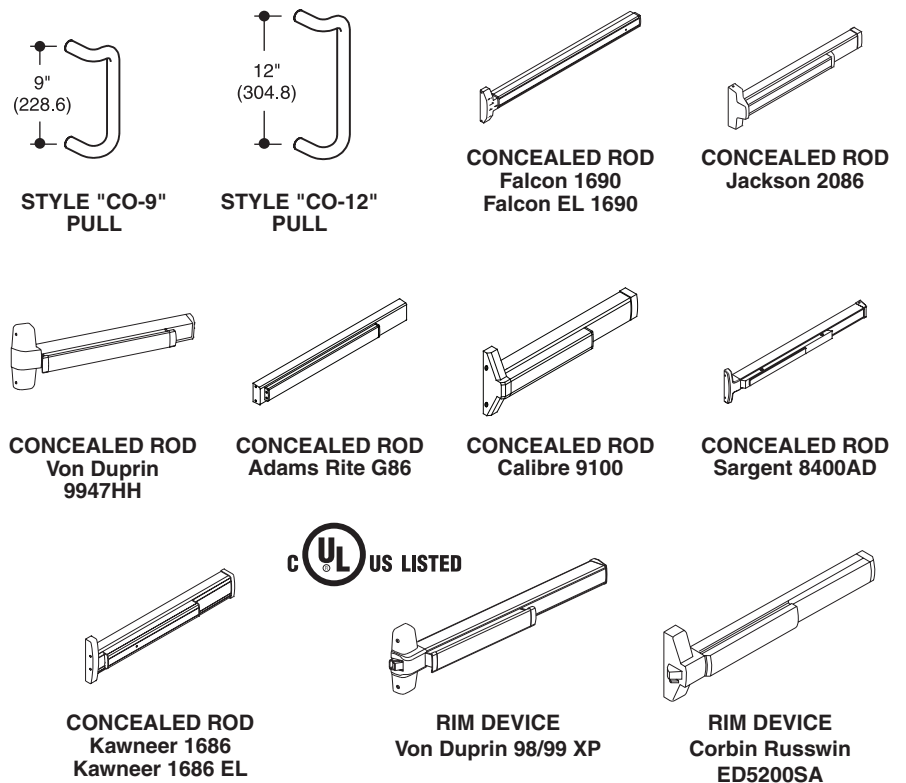
STYLE "CPN" PULL ON EXTERIOR OF DOOR



EXTERIOR VIEW OF 350 IR DOOR (500 IR SIMILAR)
"CPN" PULL AND OPTIONAL CYLINDER GUARD SHOWN.

SEE PAGE 14 AND 15 FOR COMPLETE
PANELINE™ INFORMATION

EXIT DEVICES AND PULLS





SCALE 3" = 1' - 0"

PANELINE™ EXIT DEVICE

The Paneline™ concealed rod exit device will accommodate variations in door width as shown in the following illustrations.

The Optional Paneline™ EL device is designed for electrified access control and is compatible with most key pad and card reader systems.

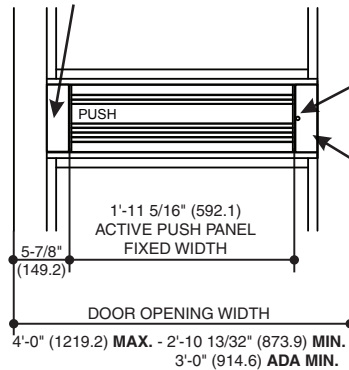
See **Hardware Section** for complete description of Paneline hardware, including finish of units.

Paneline™ uses mortise cylinder in lieu of the normal rim-type.



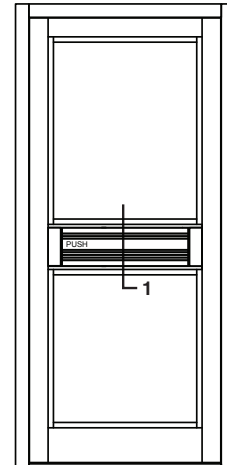
INTERIOR VIEW

LOCK STILE TRIM FILLER WIDTH
VARIES WITH STILE WIDTH

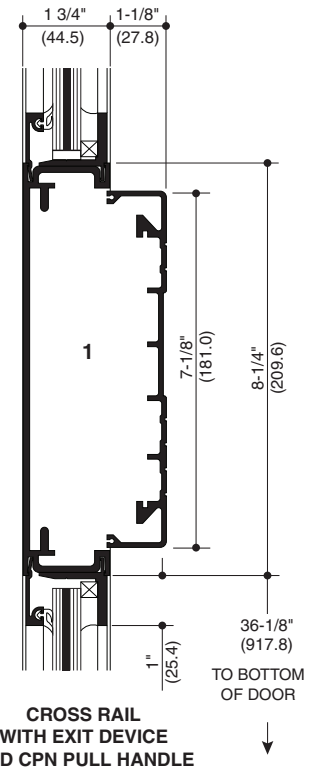


EXTERIOR VIEW

EXTERIOR VIEW OF 350 IR DOOR (500 IR SIMILAR) WITH
"CPN" PULL AND OPTIONAL CYLINDER GUARD SHOWN

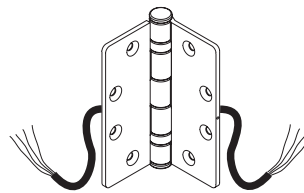


INTERIOR ELEVATION

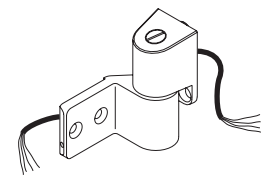


CROSS RAIL WITH EXIT DEVICE AND CPN PULL HANDLE

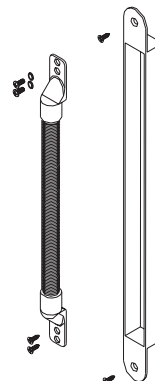
PANELINE™ EL COMPONENTS



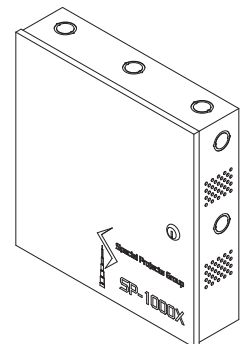
POWER TRANSFER INTERMEDIATE BUTT HINGE



POWER TRANSFER INTERMEDIATE OFFSET PIVOT



ELECTRIC POWER TRANSFER (EPT)



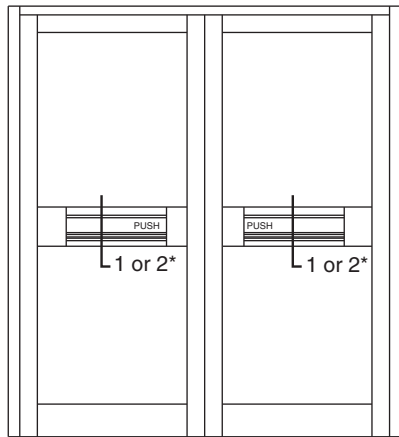
SP-1000X POWER SUPPLY

PANELINE™ EXIT DEVICE

See **Hardware Section** for complete description of Paneline™ hardware, including finish of units.

Paneline™ uses mortise cylinder in lieu of the normal rim-type.

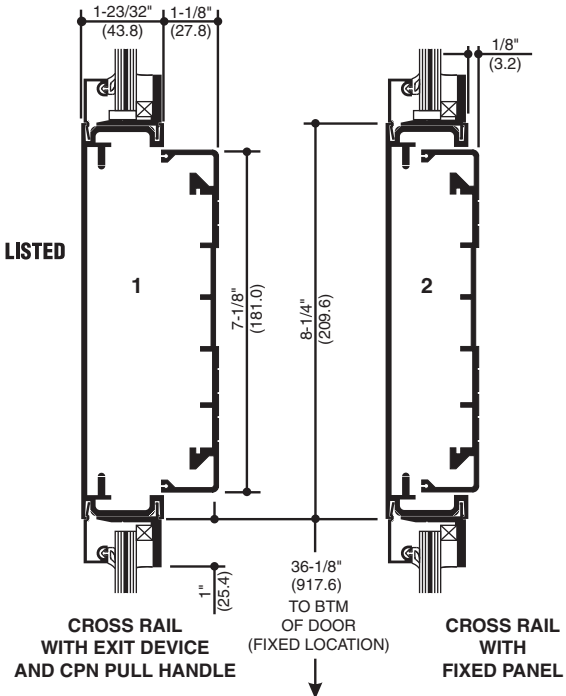
INTERIOR ELEVATION



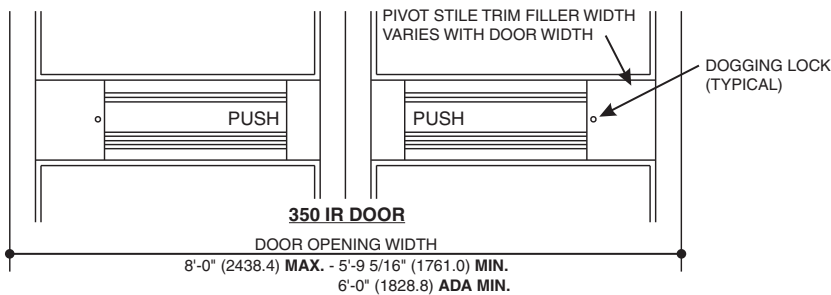
INACTIVE DOOR

ACTIVE DOOR

* **ALTERNATE CROSSRAIL FOR VESTIBULE DOORS**
(Without Exit Device or Lock)



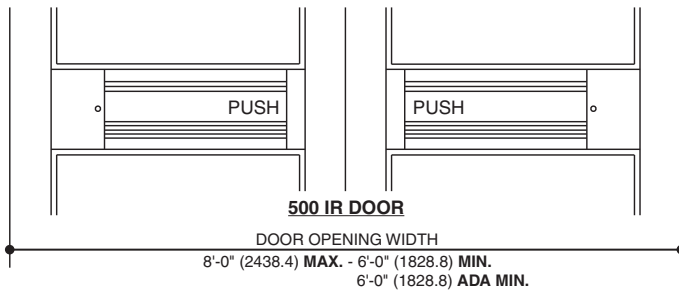
INTERIOR VIEW



350 IR DOOR

DOOR OPENING WIDTH

8'-0" (2438.4) MAX. - 5'-9 5/16" (1761.0) MIN.
6'-0" (1828.8) ADA MIN.



500 IR DOOR

DOOR OPENING WIDTH

8'-0" (2438.4) MAX. - 6'-0" (1828.8) MIN.
6'-0" (1828.8) ADA MIN.

STYLE "CPN" PULL ON
EXTERIOR OF DOOR



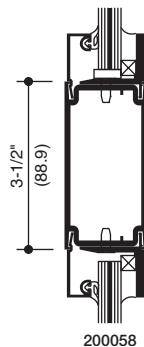
EXTERIOR VIEW

EXTERIOR VIEW OF 350 IR DOOR (500 IR SIMILAR) WITH
"CPN" PULL AND STANDARD CYLINDER GUARD SHOWN

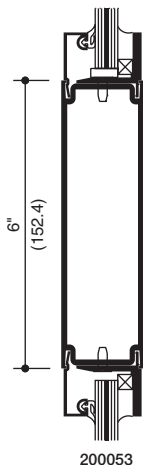
SCALE 3" = 1' 0"

HORIZONTAL CROSS RAILS

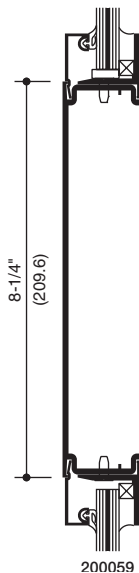
3-1/2" CROSS RAIL



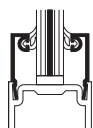
6" CROSS RAIL



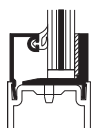
8-1/4" CROSS RAIL



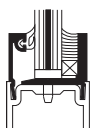
INFILL OPTIONS



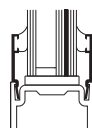
**9/16" IMPACT
GLASS STOP**
(Dry Glaze)
(STANDARD)



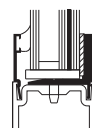
**9/16" IMPACT
GLASS STOP**
(3M Tape Glaze)



**9/16" IMPACT
GLASS STOP**
(Structural Silicone Glaze)



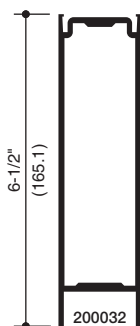
**1" IMPACT
GLASS STOP**
(Dry Glaze)



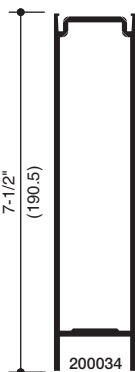
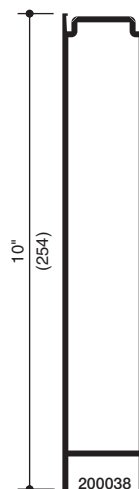
**1" IMPACT
GLASS STOP**
(3M Tape Glaze)

BOTTOM RAILS

Rail height shown may be used on 350 IR and 500 IR doors.



6-1/2" BOTTOM RAIL
(STANDARD)

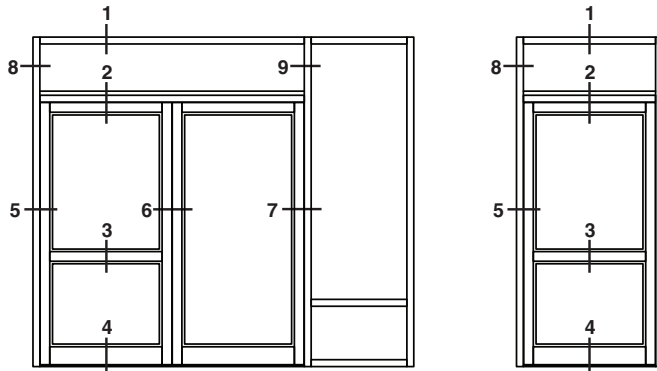
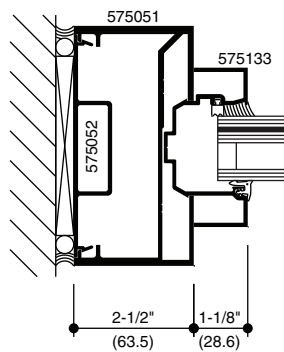
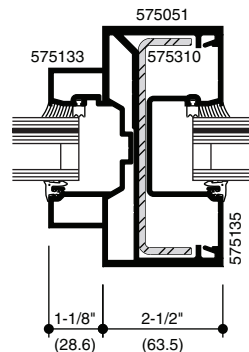
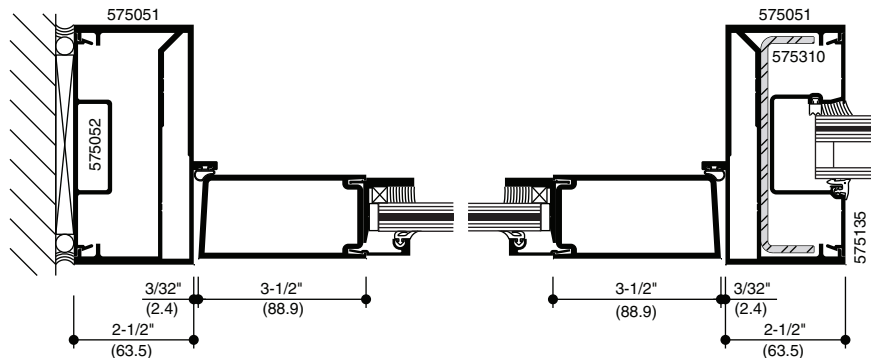
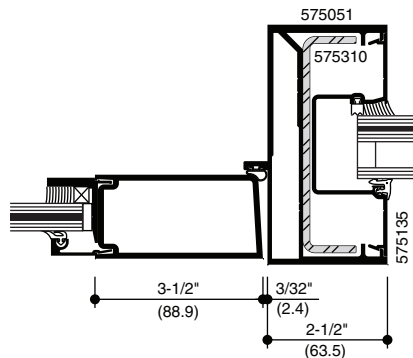
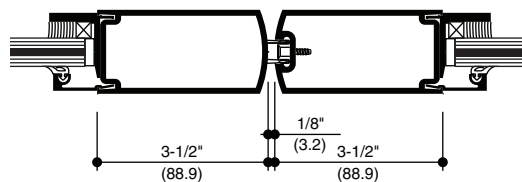
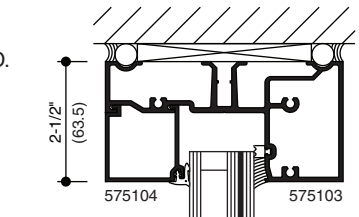
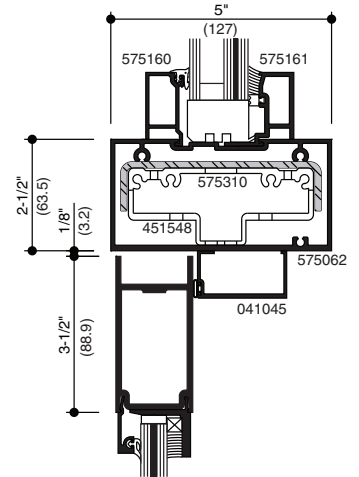
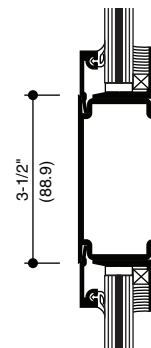
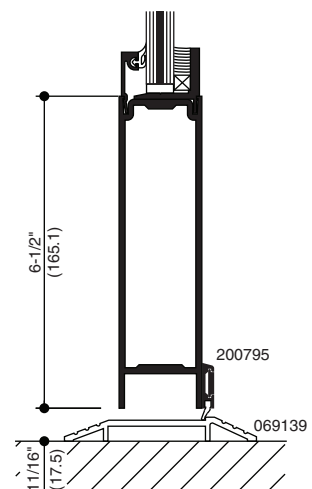
**7-1/2" BOTTOM RAIL****10" BOTTOM RAIL**

Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.
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SCALE 3" = 1'-0"**NOTE:**

1. 350 IR MEDIUM STILE DOORS ARE DETAILED. 500 IR WIDE STILE DOORS MAY ALSO BE USED.
2. IR 501 FRAMING WITH 1-5/16" (33.3) GLAZING IS DETAILED WITH THESE DOORS.

**ELEVATION IS NUMBER KEYED TO DETAILS****8
DOOR JAMB
AT TRANSOM****9
DOOR JAMB
AT TRANSOM****5
DOOR JAMB****7
DOOR JAMB****6
PAIR OF DOORS****1
TRANSOM HEAD****2
DOOR WITH TRANSOM****3
CROSS RAIL****4
THRESHOLD**



LOCKING OPTIONS	MAXIMUM DOOR SIZE	MAXIMUM BLAST LOADING	HINGING OPTIONS	GLAZING STOP OPTIONS	GLASS THICKNESS
Kawneer 1686 Concealed Rod Exit Device	Single 4'-0" x 8'-0" (1219.2 x 2438.4) Pair 8'-0" x 8'-0" (2438.4 x 2438.4)	Peak Pressure: 5.8 PSF Impulse: 41 PSI/M-SEC	Offset Pivots	1	9/16" (14.3)

Test conditions shown. Other conditions may be supported through calulation.

Glazing Stop Options:

- 1 - Structural silicone with 0.060 Kuraray or Eastman PVB inter layer.

Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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STANDARD

OPTIONAL

Doors	Medium stile 350 IR	Wide stile 500 IR
Door Sizes	Maximum size shown on page 11.	Maximum door sizes are determined by hardware type, refer to specific hardware for size limitations.
Glass Stops	Square stops for 9/16" (14.3) infill, interior and exterior snap in glass stop.	Square stops for 9/16" (14.3) or 1" (25.4) infill, interior screw applied glass stop with 3M VHB structural tape. Square stops for 9/16" (14.3) infill, interior screw applied glass stop with silicone seal. Square stops for 1" (25.4) infill, interior and exterior snap in glass stop.
Door Frames	IR 500 2-1/2" x 5" (63.5 x 127)	*IR 501 2-1/2" x 5" (63.5 x 127) *IR 501T/UT 2-3/4" x 5" (69.9 x 127) Trifab™ VG 450 1-3/4" x 4-1/2" (44.5 x 114.3) Trifab™ VG 451 2" x 4-1/2" (50.8 x 114.3) Trifab™ VG 451T 2" x 4-1/2" (50.8 x 114.3) Trifab™ 601/601T 2" x 6" (50.8 x 152.4) 1600 sub-frame with door jamb adaptors and sub-head
Push-Pulls	Single Acting: Architects Classic Hardware "CO-9" Pull and "CP-II" Push Bar. Architects Classic Hardware "CO-9" Pull and "CP" Push Bar.	Single Acting: Architects Classic Hardware "CO-12" and "CP-II" push bar. Architects Classic Hardware "CO-12" and "CP" push bar. Architects Classic Hardware "CO-9"/"CO-9" Pulls. Architects Classic Hardware "CO-12"/"CO-12" Pulls.
Door Closers	Single Acting: Norton 1601 Adjustable or 1601 BF Adjustable Surface Closer with back-check, with or without adjustable hold open. Standard concealed overhead closer with single acting offset arm.	Single Acting: LCN 4040 surface closer with or without adjustable hold-open. LCN 2010, 2030 or 5010 concealed overhead closers with or without hold-open. LCN 1260 adjustable surface closer. Norton 8100 surface closer with a 50% spring power adjustment (for opening forces of less than 8 pounds). Closer is available with standard back-checks and with or without the hold-open feature. International single acting concealed overhead closer. Falcon SC 60 Surface closer.
Hinging	Single Acting: Kawneer top and bottom offset pivots (or) Kawneer top and bottom 4 1/2" x 4" (114.3 x 101.6) ball bearing butt hinge with non-removable pin (NRP) (or) Kawneer continuous gear hinge.	---
Intermediate Pivots/Butts	Single Acting: Kawneer intermediate offset pivot (or) Kawneer 4-1/2" x 4" (114.3 x 101.6) ball bearing butt hinge with non-removable pin (NRP).	---
Locking	MS 1850 Deadbolt 3-Point Lock with 4016 Top Bolt and 4056 Bottom Bolt. Hurricane Resistant Flush Bolts required on pairs.	Adams Rite 2180 Dead Lock Flush Bolt for pair only.

NOTE:

*IR 501 door frame uses IR 500 door jamb with IR 501 filler.

Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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	STANDARD	OPTIONAL
Doors	Medium stile 350 IR	Wide stile 500 IR
Thresholds	A 1/2" x 4" (12.7 x 101.6) aluminum mill finish threshold.	---
Weathering	Single Acting: Weathering system in the door and frame consisting of a dense, bulb polymeric material, which remains resilient and retains its weathering ability under temperature extremes. (The system is complete with an optional EPDM blade gasket sweep strip applied to the bottom door rail with concealed fasteners).	Bottom Door Sweep
Exit Device	Kawneer 1686 Concealed Rod Exit Device with or without a mortised type cylinder. Exit Device Pulls: Architects Classic style "CO-9" Pull with Kawneer 1686 exit device. Architects Classic style "CPN" Pull for Paneline™ and Paneline™ EL exit devices.	Kawneer Paneline™ Conc. Rod Exit Device Kawneer Paneline™ EL Conc. Rod Exit Device Jackson 2086 Concealed Rod Exit Device Adams Rite G86 Conc. Rod Exit Device Calibre 9100 Conc. Rod Exit Device Falcon HH1690 Conc. Rod Exit Device Sargent 8400AD Concealed Rod Exit Device Von Duprin HH9947 Conc. Rod Exit Device Von Duprin 98/99 XP Rim Device Corbin Russwin ED5200SA Rim Device Optional Exit Device Pulls: Architects Classic style "CO-12" Pull with Kawneer 1686 exit device.

NOTE:

*IR 501 door frame uses IR 500 door jamb with IR 501 filler.

Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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TEXAS DEPARTMENT OF INSURANCE

Engineering Services Program / MC 103-3A 333 Guadalupe Street P.O. Box 149104 Austin, Texas 78714-9104
Phone No. (512) 322-2212 Fax No. (512) 463-6693

PRODUCT EVALUATION

DR-668

Effective Date: February 1, 2014

Reevaluation Date: **February 2018**

*The following product has been evaluated for compliance with the wind loads specified in the **International Residential Code (IRC)** and the **International Building Code (IBC)**.*

This product evaluation is not an endorsement of this product or a recommendation that this product be used. The Texas Department of Insurance has not authorized the use of any information contained in the product evaluation for advertising, or other commercial or promotional purpose.

This product evaluation is intended for use by those individuals who are following the design wind load criteria in Chapter 3 of the IRC and Section 1609 of the IBC. The design loads determined for the building or structure shall not exceed the design load rating specified for the products shown in the limitations section of this product evaluation. This product evaluation does not relieve a Texas licensed engineer of his responsibilities as outlined in the Texas Insurance Code, the Texas Administrative Code, and the Texas Engineering Practice Act.

IR350/500 HW Aluminum Glazed Outswing Hinged Doors, Impact Resistant, manufactured by

Kawneer Company, Inc.
555 Guthridge Court
Norcross, Georgia 30092-3503
Telephone: (770) 840 - 6426

will be acceptable in designated catastrophe areas along the Texas Gulf Coast when installed in accordance with the manufacturer's installation instructions and this product evaluation.

PRODUCT DESCRIPTION

This evaluation report is for IR350/500 HW aluminum glazed outswing hinged doors. The aluminum glazed outswing hinged doors are used for commercial curtain wall and storefront installations.

General Description:

This evaluation report includes the following hinged door assemblies:

Double Door with Trifab 450, 451 or IR500/501 Framing
Single Door with Trifab 450, 451 or IR500/501 Framing
Double Door within 1600 System 1 Curtain Wall

Curtain Wall and Storefront: Curtain wall and storefront framing referenced in this product evaluation report are the Trifab 450, 451; the IR500/501; or the 1600 System 1. The curtain wall and storefront framing are not part of this product evaluation report. Curtain wall and storefront framing used with these assemblies shall be listed in a separate Texas Department of Insurance product evaluation report.

Product Identification: A manufacturer-produced label shall be applied to the door assembly. The label includes the manufacturer's name (Kawneer); the product name (IR350/500 HW Door); that the design pressure and size are per drawing #1821T; and that the product complies with ASTM E 330, ASTM E 1886, ASTM E 1996, Large Missile Impact, Zone 4-Level D.

LIMITATIONS

Design Drawings: The door assemblies shall be installed in accordance with the following drawing:

Drawing No. 1821T, titled "IR350/500 HW Wind Zone 4 L.M.I. Out-Swing Doors," Sheets 1 thru 12 of 12, dated March 19, 2013, signed and sealed by Warren W. Schaeffer., P.E on March 20, 2013. The stated drawings will be referred to as the approved drawings in this evaluation report.

Fabrication and Assembly: Kawneer aluminum glazed outswing hinged doors are fabricated in the factory. The aluminum glazed outswing hinged doors are assembled and glazed at the jobsite. The approved drawings referenced in this evaluation report indicate the options for the glazing construction.

Design pressure (DP): Maximum design pressure: ± 110 psf. The allowable design pressure varies depending on door type (double or single), door geometry, hardware (lock option) used, and glass option. Refer to the approved drawings for specific design pressure requirements.

If the doors are used with curtain wall or storefront framing, then the design pressure rating of the complete assembly shall be the lesser of the allowable design pressure rating for the curtain wall or storefront framing and the doors in this evaluation report

Hardware: Hardware options are specified on the approved drawings. The allowable design pressure for the door assembly varies as a function of the hardware option used. Refer to the approved drawings for allowable hardware options and specific design pressure requirements.

Impact Resistance: These door assemblies satisfy the Texas Department of Insurance's criteria for protection from windborne debris in both the **Inland I** and **Seaward** zones. These assemblies have passed an impact criteria equivalent to Missile Level D specified in ASTM E 1996-04. These assemblies may be installed at any height on the structure as long as the design pressure rating for the assembly is not exceeded. These assemblies will not need to be protected with an impact protective system when installed in areas where windborne debris protection is required.

INSTALLATION INSTRUCTIONS

General: The assembly shall be prepared and installed in accordance with the manufacturer's recommended installation instructions. Detailed installation instructions are available from the manufacturer.

Installation:

Wall Framing Construction: The aluminum glazed outswing hinged door assemblies may be mounted to several types of wall framing construction. The types of wall framing construction allowed include:

- Concrete (minimum compressive strength: 3,000 psi)
- Wood dimension lumber (minimum Southern Yellow Pine)
- Masonry – (ASTM C-90, Grade N, Type 1 or greater)
- Steel studs (minimum 16 gauge, 33 ksi)
- Steel (1/8" thick, A36 (minimum $F_y = 36$ ksi))
- Aluminum (0.100" thick 6063-T5)

Fastener Requirements:

- Refer to the approved drawings for the anchor layout and notes.
- Refer to the approved drawings for the minimum embedment depths for the fasteners and the minimum edge distances (minimum distance fastener must be from the edge of the substrate material) for the fasteners.

Note: The manufacturer's installation instructions shall be available on the job site during installation. All fasteners shall be corrosion resistant as specified in the International Residential Code (IRC), the International Building Code (IBC), and the Texas Revisions.

ALLOWABLE SIZE/PRESSURE TABLE									
DOOR TYPE	MAX. DOOR OPENING WIDTH (IN.)	MAX. DOOR OPENING HEIGHT (IN.)	MAX. D.L.O. WIDTH (IN.)	MAX. D.L.O. HEIGHT (IN.)	LOCK OPTION (3)	GLASS OPTION (1)	MISSILE LEVEL (2)	ALLOWABLE PRESSURE (+/- PSF)	
								DOORS IN 450, 451 OR 1600 FRAMES	DOORS IN IR500/501 FRAMES
DOUBLE	96	96	38 13/16	83 13/16	1 OR 2	1, 2 OR 5	D	110	90
	96	96	38 13/16	83 13/16	1	5	E	110	90
	72	108	30 13/16	95 3/16	1 OR 2	1 OR 2	D	110	90
	96	96	38 13/16	83 13/16	1 THRU 3	1, 2, 3 & 5	D	70	70
	72	96	30 13/16	83 13/16	1 THRU 3	4	D	60	60
SINGLE	48	96	38 13/16	83 13/16	1 OR 2	1, 2 OR 5	D	110	90
	48	96	38 13/16	83 13/16	1	5	E	110	90
	36	108	30 13/16	95 3/16	1 OR 2	1 OR 2	D	110	90
	48	96	38 13/16	83 13/16	1 THRU 3	1, 2, 3 & 5	D	70	70
	36	96	30 13/16	83 13/16	1 THRU 3	4	D	60	60

LOCK OPTIONS:

- OPTION 1 = ADAMS RITE 1850 3 POINT LOCK AT ACTIVE PANEL (ITEM #57) & ADAMS RITE FLUSHBOLTS AT HEAD AND SILL (ITEM #58) OF INACTIVE PANEL.
- OPTION 2 = KAWNEER 1686 DEADBOLT & PANIC DEVICE (ITEM #59) AT ACTIVE PANEL & KAWNEER 1686 PANIC DEVICE (ITEM #60) AT INACTIVE PANEL.
- OPTION 3 = SCHLAGE DEADBOLT WITH & EITHER FALCON HH 1690 OR VON DUPRIN HH9947 CVR PANIC DEVICE (ITEM #61) AT ACTIVE PANEL & EITHER FALCON HH 1690 OR VON DUPRIN HH9947 CVR PANIC DEVICE (ITEM #62) AT INACTIVE PANEL.

PRESSURE TABLE FOOTNOTES:

- (1) FOR GLASS OPTIONS SEE GLAZING DETAILS ON SHEET 11.
- (2) WHEN MISSILE LEVEL E IS REQUIRED ONLY LOCK OPTION 1 & GLASS OPTION 5 ARE APPLICABLE.

NOTE: THESE DOORS ARE NOT APPROVED FOR USE WHERE WATER INFILTRATION RESISTANCE IS REQUIRED BY THE DOOR. UNLESS UNITS ARE INSTALLED IN NON-HABITABLE AREAS WHERE THE UNIT & THE AREA ARE DESIGNED TO ACCEPT WATER INFILTRATION, UNITS SHALL BE INSTALLED ONLY AT LOCATIONS PROTECTED BY A CANOPY OR OVERHANG WHERE-BY THE OVERHANG(OH) RATIO IS EQUAL TO OR MORE THAN.

GENERAL NOTES:

1. THESE DOOR SYSTEMS HAVE BEEN TESTED, ANALYZED & APPROVED FOR DESIGN PRESSURES NOT TO EXCEED THOSE SHOWN IN THE "ALLOWABLE DESIGN PRESSURE TABLE(S)".
2. OPENINGS, BUCKING & BUCKING FASTENERS MUST BE PROPERLY DESIGNED & INSTALLED TO TRANSFER WIND LOADS TO THE STRUCTURE.
3. ALL HARDWARE & FASTENERS SHALL BE IN ACCORDANCE WITH THESE DRAWINGS & SHALL NOT VARY UNLESS SPECIFICALLY MENTIONED ON THE DRAWINGS. SPECIFIED ANCHOR EMBED TO BASE MATERIAL SHALL BE BEYOND WALL FINISH OR STUCCO.
4. THE DETAILS & SPECIFICATIONS SHOWN HEREIN REPRESENT THE PRODUCTS TESTED & PROPOSED FOR WATER, AIR, IMPACT, CYCLIC & UNIFORM STATIC AIR PRESSURE TESTING IN CONFORMANCE WITH ASTM E330, E283, E1886, E1996 & AMMA 1304 FOR LARGE MISSILE IMPACT DOORS.
5. THESE DOOR SYSTEMS HAVE BEEN DESIGNED IN ACCORDANCE WITH AND MEET THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (IBC).
6. IMPACT SHUTTERS ARE NOT REQUIRED WITH THESE DOORS.
7. ALL ANCHORS SECURING DOOR FRAME TO PRESSURE TREATED BUCKS OR WOOD FRAMING SHALL BE CAPABLE OF RESISTING CORROSION CAUSED BY THE PRESSURE TREATING CHEMICALS IN THE WOOD.
8. DETERMINE THE POSITIVE & NEGATIVE DESIGN LOADS TO USE WHEN REFERENCING THESE DOCUMENTS IN ACCORDANCE WITH THE GOVERNING CODE AND GOVERNING WIND VELOCITY. FOR WIND LOAD CALCULATIONS IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, A DIRECTIONALITY FACTOR OF $K_D = 0.85$ MAY BE APPLIED PER THE ASCE-7 STANDARD.
9. NO INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE CERTIFICATION OF THIS PRODUCT. WIND LOAD DURATION FACTOR $C_D = 1.6$ WAS USED FOR WOOD SCREW ANALYSIS ONLY.
10. MATERIALS, INCLUDING BUT NOT LIMITED TO STEEL SCREWS, THAT COME INTO CONTACT WITH OTHER DISSIMILAR MATERIALS SHALL BE SEPARATED OR COATED AS REQUIRED TO AVOID CORROSION OF EITHER MATERIAL.
11. TO THE BEST OF OUR KNOWLEDGE, THE DOOR SYSTEMS SHOWN HEREIN ARE QUALITY ASSURED BY AN APPROVED CERTIFICATION/QA ENTITY & SHALL BE LABELED IN ACCORDANCE WITH APPLICABLE STANDARDS. THESE DRAWINGS SHOW ALL APPLICABLE ELEVATION, COMBINATION, INSTALLATION & COMPARATIVE ANALYSIS CONDITIONS AS DETERMINED THROUGH TESTING & ENGINEERING RATIONAL ANALYSIS. DOOR ASSEMBLY SHALL BE IN ACCORDANCE WITH THESE DRAWINGS, THE MANUFACTURER'S QUALITY ASSURANCE SPECIFICATIONS & TESTING REPORTS.
12. CERTIFICATION OF THESE DOOR SYSTEMS SHALL BE CONSIDERED VOID IF THEY ARE INSTALLED WITHOUT A BUILDING PERMIT FROM THE APPLICABLE LOCAL BUILDING DEPARTMENT OR IF THEY ARE INSTALLED BY ANYONE OTHER THAN A LICENSED CONTRACTOR EXPERIENCED WITH DOOR INSTALLATIONS.

FRAME ANCHOR REQUIREMENTS TABLE			
OPENING TYPE (SUBSTRATE)	FRAME & MULLION PLATE TO OPENING FASTENER TYPE	MINIMUM EMBED	MINIMUM EDGE DIST.
FRAME SCREWS			
(2) MIN. 2X6 WOOD FRAME OR BUCK (MIN. GR. 2 & G=0.55)	NO. 14 OR 1/4" GR. 5 COARSE THREAD SCREW OR 1/4" CONCRETE SCREW	1 1/4"	3/4"
MIN. 16 GA. 33 KSI METAL STUD	1/4" GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
MIN. 1/8" THK A36 STEEL	1/4" GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
MIN. 0.100" THK 6063-T5 ALUM.	1/4" GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
(3) MIN. C-90 CONCRETE FILLED BLOCK	(1) 1/4" CONCRETE SCREW	1 1/2"	2 1/2"
MIN. 3000 PSI CONCRETE	(1) 1/4" CONCRETE SCREW	1 3/4"	2 1/2"
(1) CONCRETE SCREWS SHALL BE ELCO ULTRACONS (C.S.), ELCO CRETE-FLEX (S.S.), ITW RAMSET/RED HEAD TAPCONS (C.S. OR S.S.) OR HILTI KWIK-CON II (C.S. OR S.S.).			
(2) 2X6 BUCKS SHALL BE OF A MINIMUM DEPTH REQUIRED TO MEET ANCHOR EDGE DISTANCE REQUIREMENTS BUT NO LESS THAN 4 1/4".			
(3) CONCRETE FILLED BLOCK SUBSTRATE IS NOT APPLICABLE AT HEAD & SILL			

CORNER CONSTRUCTION:

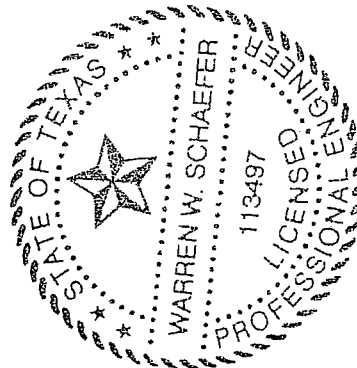
TRIFAB 450 OR 451 FRAME HEAD: VERTICAL MEMBERS RUN THROUGH WHILE THE HORIZONTAL MEMBERS ARE SQUARE CUT, BUTTED AND MECHANICALLY FASTENED TO THE VERTICAL MEMBERS VIA A SHEAR BLOCK (ITEM #17). THE SHEAR BLOCK IS MECHANICALLY FASTENED TO THE VERTICAL FRAME MEMBER WITH 4 NO. 10 X 1 19/32" PHTF SCREWS. THE HORIZONTAL FRAME MEMBERS ARE ATTACHED TO THE SHEAR BLOCK WITH 2 NO. 10 X 9/16" FHTF SCREWS. CORNERS ARE SEALED WITH SILICONE SEALANT.

IR500/501 FRAME HEAD: VERTICAL MEMBERS RUN THROUGH WHILE THE HORIZONTAL MEMBERS ARE SQUARE CUT, BUTTED AND MECHANICALLY FASTENED TO THE VERTICAL MEMBERS VIA A SHEAR BLOCK (ITEM #18). THE SHEAR BLOCK IS MECHANICALLY FASTENED TO THE VERTICAL FRAME MEMBER WITH 4 NO. 12 X 1 7/8" FHTF SCREWS. THE HORIZONTAL FRAME MEMBERS ARE ATTACHED TO THE MULLION WITH 3 NO. 12 X 1" PHTF SCREWS. CORNERS ARE SEALED WITH SILICONE SEALANT.

FRAME HEAD WITHIN 1600 SYSTEM 1 CURTAIN WALL: VERTICAL MEMBERS RUN THROUGH WHILE THE HORIZONTAL MEMBERS ARE SQUARE CUT, BUTTED AND MECHANICALLY FASTENED TO THE VERTICAL MEMBERS VIA A SHEAR BLOCK (ITEM #19). THE SHEAR BLOCK IS MECHANICALLY FASTENED TO THE VERTICAL FRAME MEMBER WITH 4 NO. 10 X 1 19/32" PHTF SCREWS. THE HORIZONTAL FRAME MEMBERS ARE ATTACHED TO THE SHEAR BLOCK WITH 2 NO. 10 X 9/16" FHTF SCREWS. CORNERS ARE SEALED WITH SILICONE SEALANT.

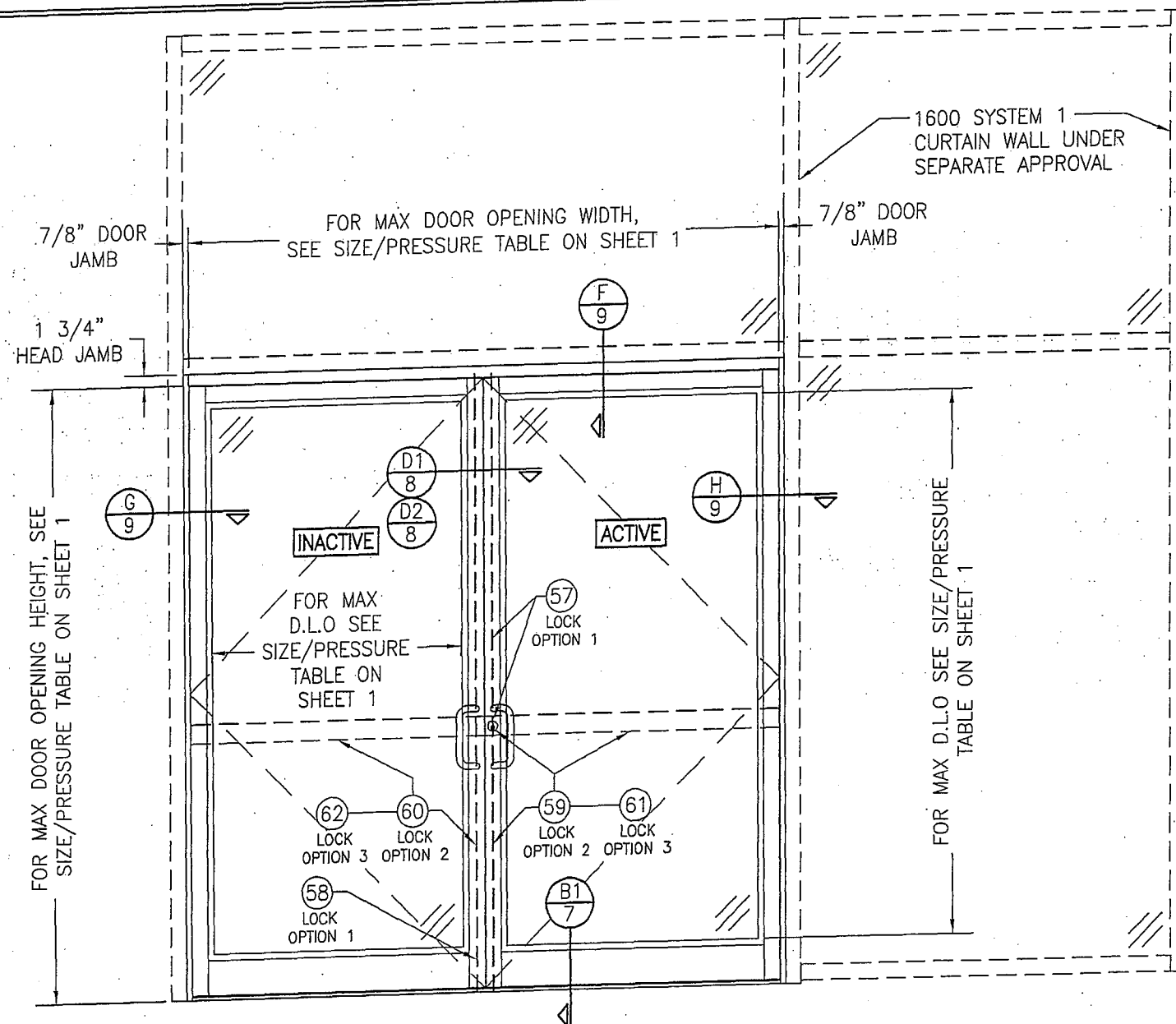
SILL: VERTICAL MEMBERS RUN THROUGH WHILE THE THRESHOLD IS SQUARE CUT, BUTTED AND MECHANICALLY FASTENED TO THE VERTICAL MEMBER VIA A PIVOT ASSEMBLY OR CLIP (ITEM #30). THE CLIP IS MECHANICALLY FASTENED TO THE VERTICAL FRAME MEMBER WITH 3 NO. 12-24 X 3/8" FHMS. THE THRESHOLD MEMBER IS ATTACHED TO THE CLIP BLOCK WITH 2 NO. 12-24 X 3/8" FHMS. CORNERS ARE SEALED WITH SILICONE SEALANT.

DOOR PANEL: VERTICAL STILES RUN THROUGH AND ARE SECURED TO THE RAILS AT THE TOP & BOTTOM WITH 1/4" THICK EXTRUDED CHANNELS. EACH CHANNEL IS FASTENED TO THE STILE & RAIL WITH 1/4-20 X 3/4" PHMS & 3/16" THICK STEEL NUT PLATES. THE INTERSECTION OF EACH CORNER JOINT WAS WELDED WITH A 1/2" DIA. PLUG WELD AND A 1 1/8" LONG FILLET WELD AT BOTH WEBS OF THE RAIL.



THESE DRAWINGS ARE APPLICABLE ONLY TO THE PRODUCT SPECIFIED. THEY MAY NOT BE USED FOR THE ASSEMBLY AND/OR INSTALLATION OF ANY OTHER PRODUCT NOR MAY THEY BE USED FOR RATIONAL AND/OR LOCAL APPROVAL OF ANY PRODUCT NOT PRODUCED BY THE MANUFACTURER STATED ON THESE DRAWINGS.

DRAWN BY: W.R.M.	CHECKED BY: W.W.S.
PLOT: 1=24	DATE: 03/19/13
DATE	BY
REVISION DESCRIPTION	NO.
DRAWING TITLE IR350/500 HW WIND ZONE 4 L.M.I. OUT-SWING DOORS	
CONSULTANTS W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980)	JOB INFORMATION KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555
CERTIFICATION MAR 20 2013	WARREN W. SCHAEFER, P.E. P.E. NO. 113497
DRAWING NO. 1821T	REV.
SHEET NO. 1	OF 12



EXTERIOR ELEVATION:
DOUBLE DOOR WITHIN 1600 SYSTEM 1 CURTAIN WALL

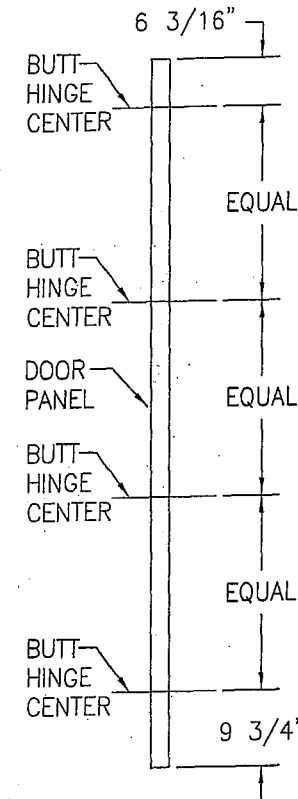
SCALE: 1/2" = 1'-0"

(FOR HINGE REQUIREMENTS, SEE HINGE LOCATION DIAGRAMS ON THIS SHEET.)

ALLOWABLE DESIGN PRESSURE
 SEE SIZE/PRESSURE TABLE ON SHEET 1

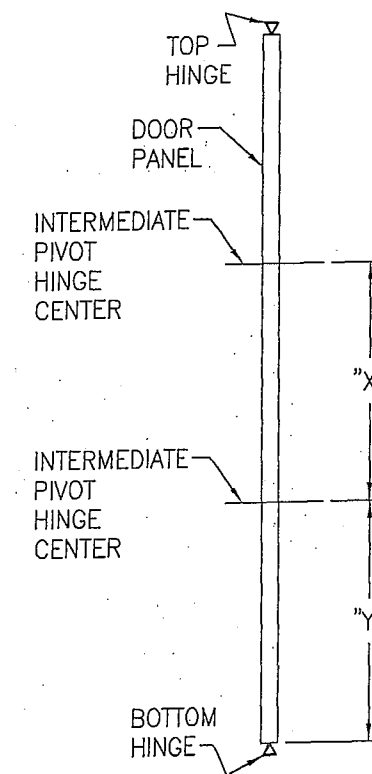
NOTES:

1. FOR DOOR INSTALLATION CONDITIONS NOT SHOWN, SEE INSTALLATION ELEVATIONS ON SHEET 4, 5 & 6.
2. DOUBLE DOOR SHOWN, SINGLE DOOR CONDITION ALSO APPLIES.
3. FOR CURTAIN WALL FRAMING REQUIREMENTS, SEE RESPECTIVE CURTAIN WALL APPROVAL.
4. ALTHOUGH DOOR SECTION IS SHOWN AT A SIDE JAMB, THE DOOR MAY BE LOCATED IN ANY BAY OF THE CURTAIN WALL.
5. THE LESSER ALLOWABLE PRESSURE FOR THE DOOR AND THAT FOR THE 1600 WALL SYSTEM SHALL CONTROL AS THE ALLOWABLE PRESSURE ON THE ASSEMBLY.



BUTT HINGE LOCATION DIAGRAM

SCALE: 1/2" = 1'-0"



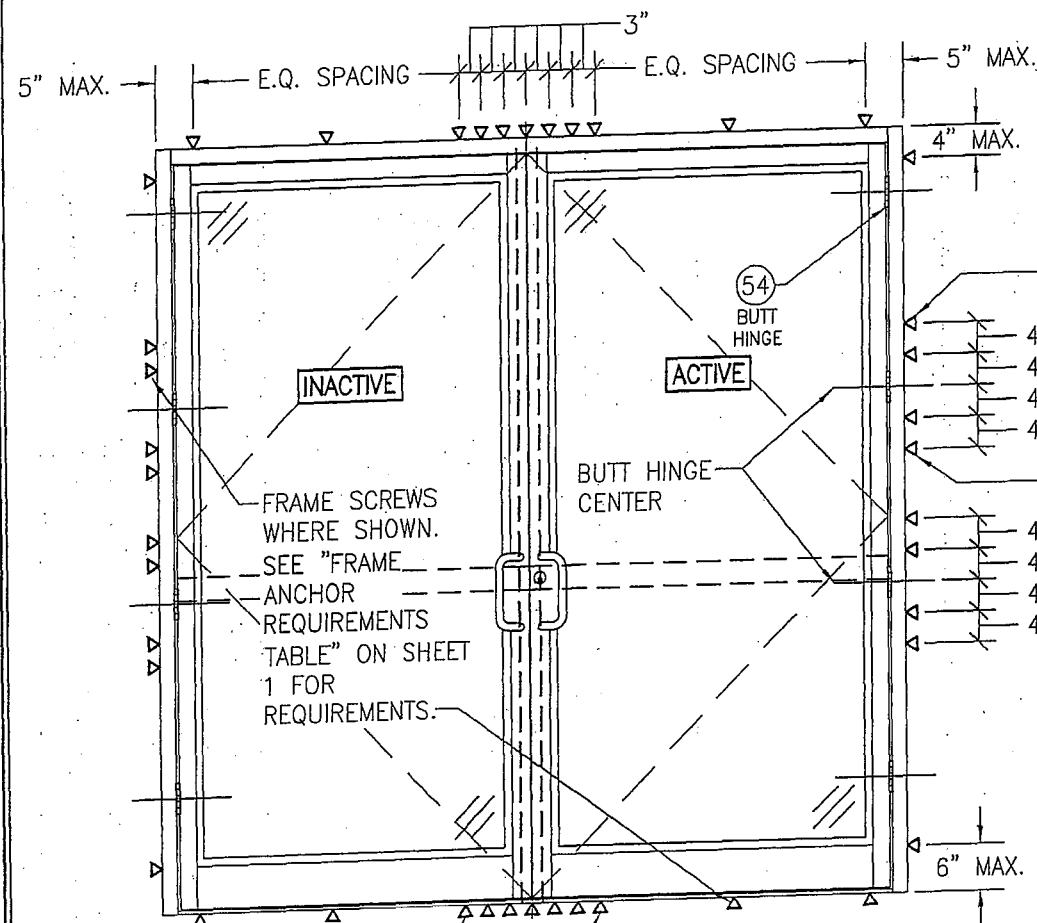
PIVOT HINGE LOCATION DIAGRAM

SCALE: 1/2" = 1'-0"

"X" = DOOR OPENING HEIGHT / (NUMBER OF INTERMEDIATE HINGES + 1)

"Y" = "X" - 13/16"

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PLOT: 1=24		DATE: 03/19/13	
DATE	BY	REVISION	DESCRIPTION
NO.			
DRAWING TITLE: IR350/500 HW WIND ZONE 4 L.M.I. OUT-SWING DOORS CONSULTANTS: W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) 7480 150TH COURT NORTH, PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424			
JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555			
CERTIFICATION: MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497			
DRAWING NO. 1821T		REV.	
SHEET NO. 3		OF 12	



NOTE: WHEN JOB
REQUIRED
PRESSURE IS
+/-70 PSF OR
LESS, THESE
OUTER MOST
SCREWS AT EACH
HINGE LOCATION
ARE NOT REQUIRED

NOTE: WHEN JOB
REQUIRED PRESSURE IS
+/-70 PSF OR LESS,
SCREW SPACING MAY BE
INCREASED TO 17\"/>

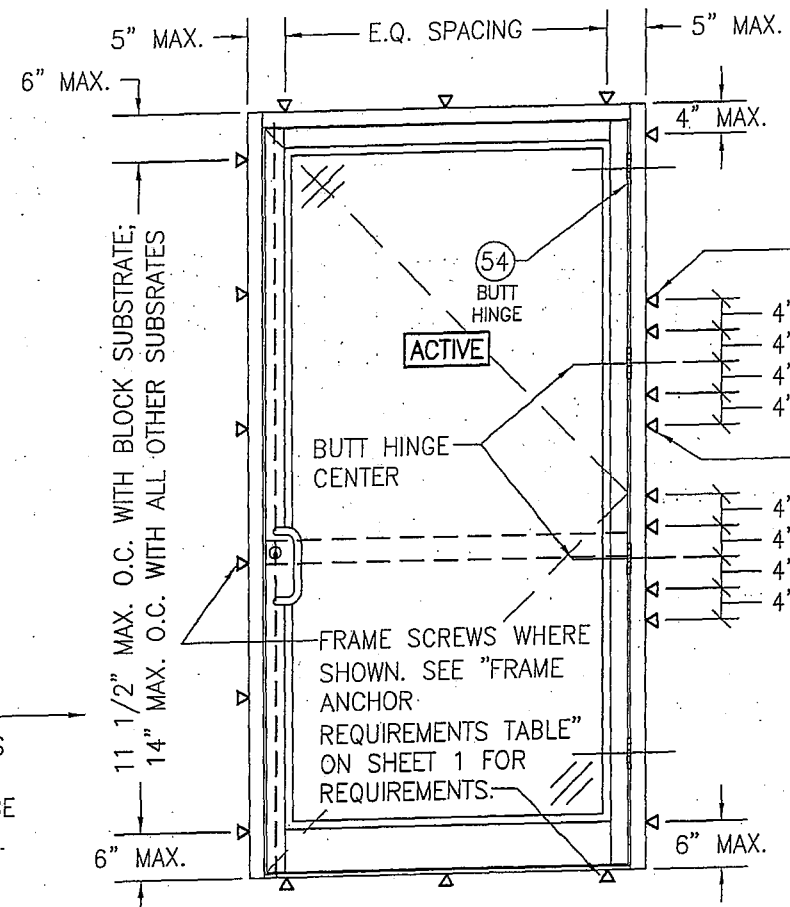
THESE 2 FRAME ANCHORS ARE
ONLY REQUIRED WHEN DESIGN
PRESSURE EXCEEDS +/-70
PSF (TYP. HEAD AND SILL)

**EXTERIOR ELEVATION:
INSTALLATION REQUIREMENTS FOR DOUBLE DOORS
WITH BUTT HINGES**

SCALE: 1/2" = 1'-0"

(FOR DOOR DETAIL NOT SHOWN, SEE ELEVATIONS ON SHEETS 2 & 3)

THE CONDITIONS SHOWN IN THESE ELEVATIONS CONSIDER
THE PERIMETER FRAMING TO BE INSTALLED TO A PUNCHED
WALL OPENING OR CURTAIN WALL SYSTEM OPENING.
WHEN DOOR PANELS ARE INSTALLED INTO A 450, 451 OR
500/501 STOREFRONT SYSTEM (NOT A PUNCHED
OPENING), THE INSTALLATION REQUIREMENTS OF THE
STORE FRONT APPROVAL SHALL CONTROL WITH THE DOOR
PANELS BEING HINGED AND LOCKED TO THE FRAMING AS
SHOWN HERE-IN.



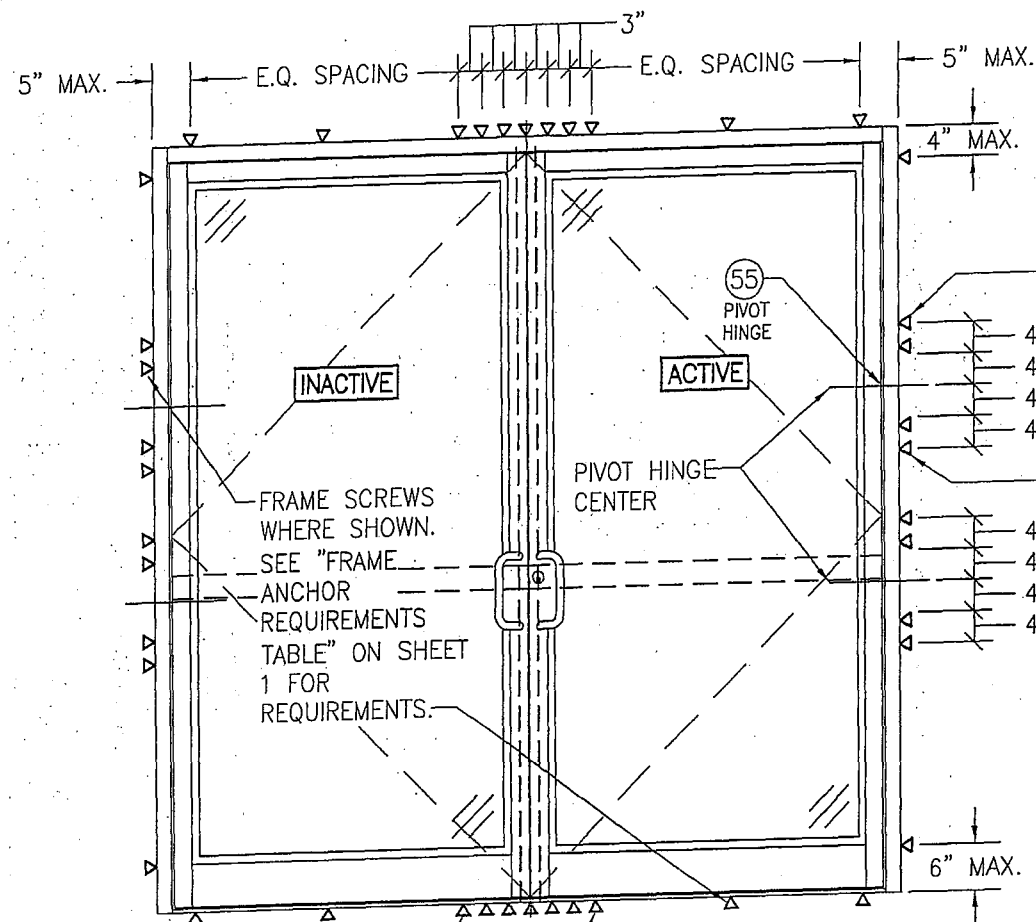
NOTE: WHEN JOB
REQUIRED
PRESSURE IS
+/-70 PSF OR
LESS, THESE
OUTER MOST
SCREWS AT EACH
HINGE LOCATION
ARE NOT REQUIRED

**EXTERIOR ELEVATION:
INSTALLATION REQUIREMENTS FOR SINGLE
DOORS WITH BUTT HINGES**

SCALE: 1/2" = 1'-0"

(FOR DOOR DETAIL NOT SHOWN, SEE ELEVATIONS ON
SHEETS 2 & 3)

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NO.	REVISION DESCRIPTION	BY	DATE
DRAWING TITLE: IR350/500 HW WIND ZONE 4 L.M.I. OUT-SWING DOORS CONSULTANTS: W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) 7480 150TH COURT NORTH, PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424 JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIE COURT, NORCROSS, GA 30092 770-449-5555			
CERTIFICATION: MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497			
DRAWING NO. 1821T		REV.	
SHEET NO. 4		OF 12	



THESE 2 FRAME ANCHORS ARE ONLY REQUIRED WHEN DESIGN PRESSURE EXCEEDS +/-70 PSF (TYP. HEAD AND SILL)

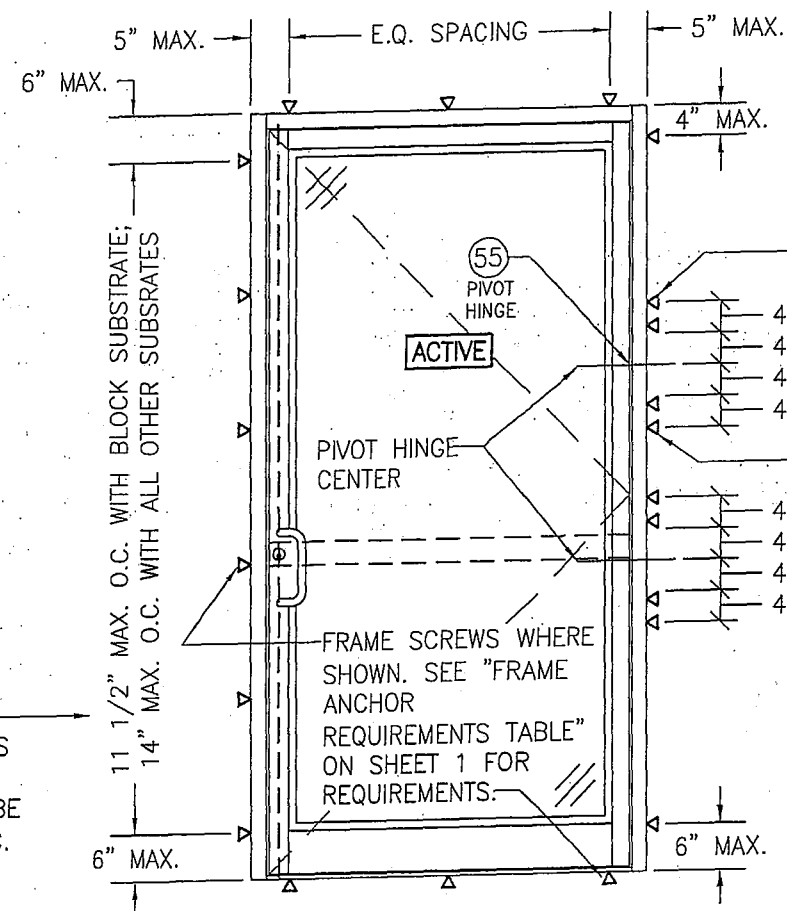
**EXTERIOR ELEVATION:
INSTALLATION REQUIREMENTS FOR DOUBLE DOORS
WITH PIVOT HINGES**

SCALE: 1/2" = 1'-0"

(FOR DOOR DETAIL NOT SHOWN, SEE ELEVATIONS ON SHEETS 2 & 3)

NOTE: WHEN JOB REQUIRED PRESSURE IS +/-70 PSF OR LESS, THESE OUTER MOST SCREWS AT EACH HINGE LOCATION ARE NOT REQUIRED

NOTE: WHEN JOB REQUIRED PRESSURE IS +/-70 PSF OR LESS, SCREW SPACING MAY BE INCREASED TO 17" O.C. WITH ALL SUBSTRATES



NOTE: WHEN JOB REQUIRED PRESSURE IS +/-70 PSF OR LESS, THESE OUTER MOST SCREWS AT EACH HINGE LOCATION ARE NOT REQUIRED.

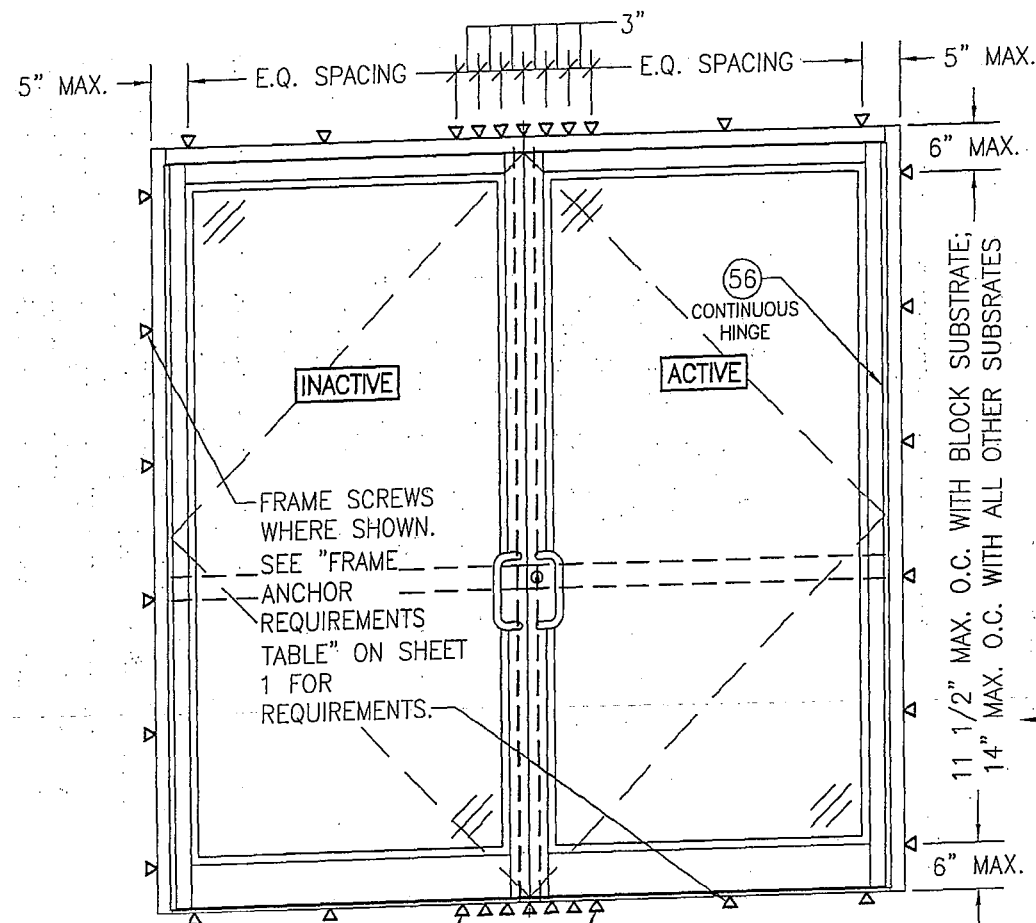
**EXTERIOR ELEVATION:
INSTALLATION REQUIREMENTS FOR SINGLE
DOORS WITH PIVOT HINGES**

SCALE: 1/2" = 1'-0"

(FOR DOOR DETAIL NOT SHOWN, SEE ELEVATIONS ON SHEETS 2 & 3)

THE CONDITIONS SHOWN IN THESE ELEVATIONS CONSIDER THE PERIMETER FRAMING TO BE INSTALLED TO A PUNCHED WALL OPENING OR CURTAIN WALL SYSTEM OPENING. WHEN DOOR PANELS ARE INSTALLED INTO A 450, 451 OR 500/501 STOREFRONT SYSTEM (NOT A PUNCHED OPENING), THE INSTALLATION REQUIREMENTS OF THE STORE FRONT APPROVAL SHALL CONTROL WITH THE DOOR PANELS BEING HINGED AND LOCKED TO THE FRAMING AS SHOWN HERE-IN.

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PLOT: 1=24		DATE: 03/19/13	
DATE	BY	REVISION DESCRIPTION	NO.
DRAWING TITLE: IR350/500 HW WIND ZONE 4 L.M.I. OUT-SWING DOORS CONSULTANTS: W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) 7480 150TH COURT NORTH, PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424 JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555			
CERTIFICATION: MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497			
DRAWING NO. 1821T		REV.	
SHEET NO. 5		OF 12	



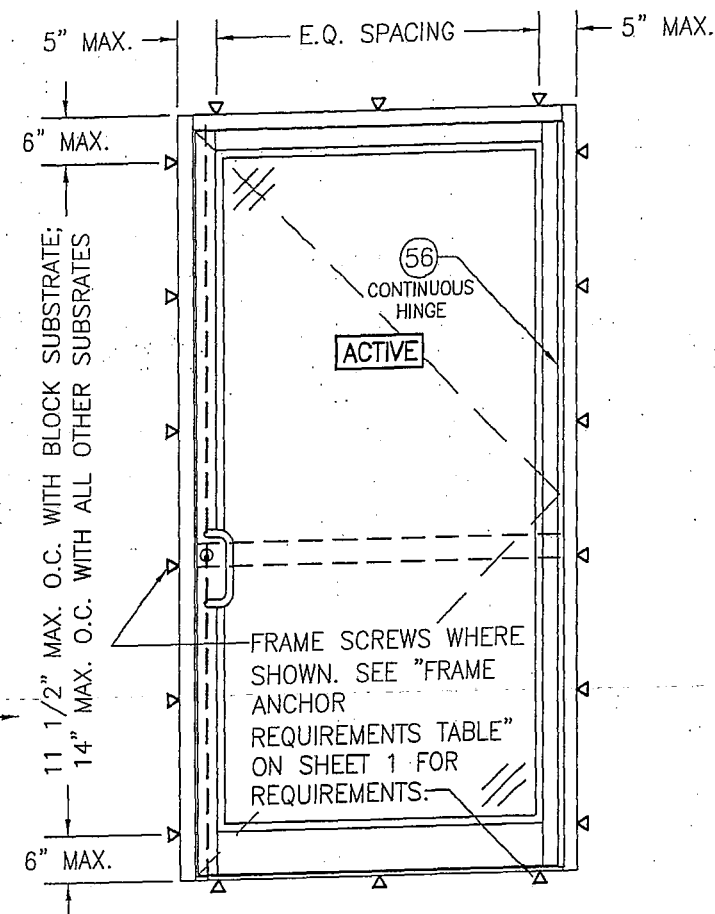
THESE 2 FRAME ANCHORS ARE ONLY REQUIRED WHEN DESIGN PRESSURE EXCEEDS +/-70 PSF (TYP. HEAD AND SILL)

**EXTERIOR ELEVATION:
INSTALLATION REQUIREMENTS FOR DOUBLE DOORS
WITH CONTINUOUS HINGES**

SCALE: 1/2" = 1'-0"

(FOR DOOR DETAIL NOT SHOWN, SEE ELEVATIONS ON SHEETS 2 & 3)

NOTE: WHEN JOB REQUIRED PRESSURE IS +/-70 PSF OR LESS, SCREW SPACING MAY BE INCREASED TO 17" O.C. WITH ALL SUBSTRATES



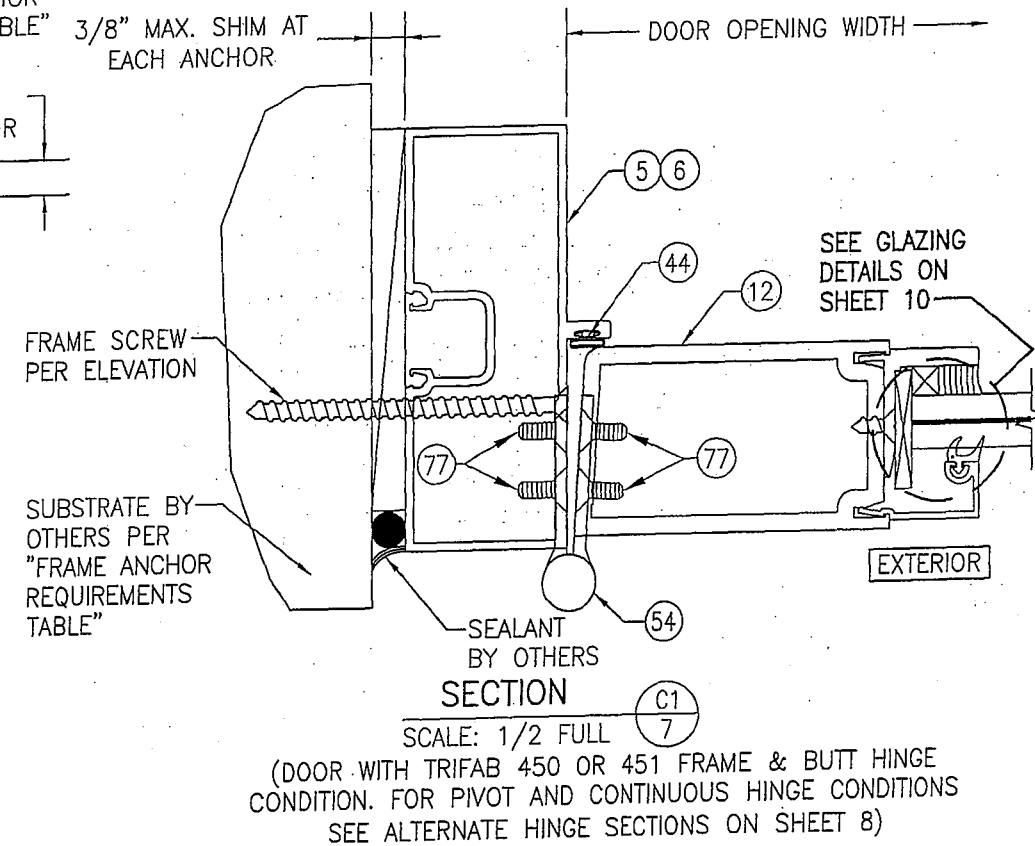
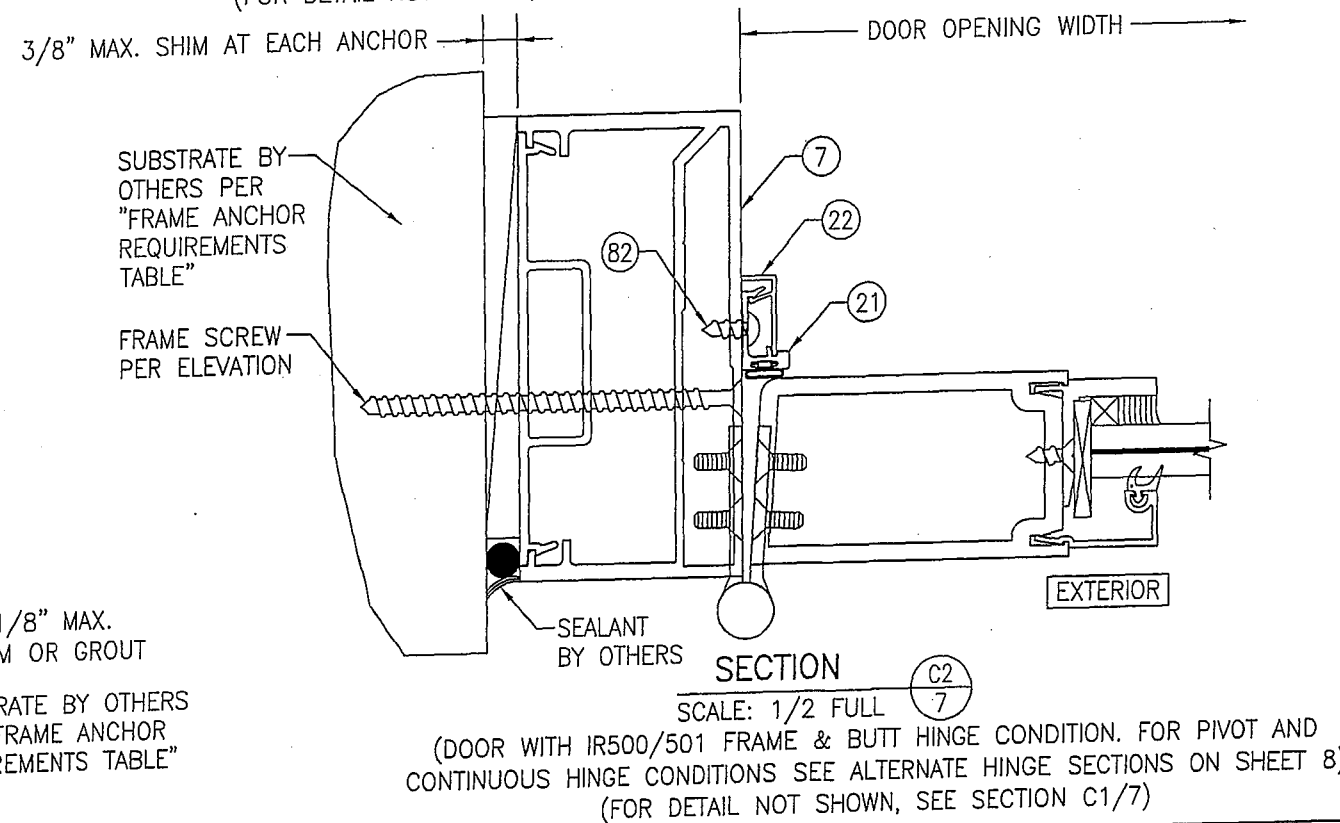
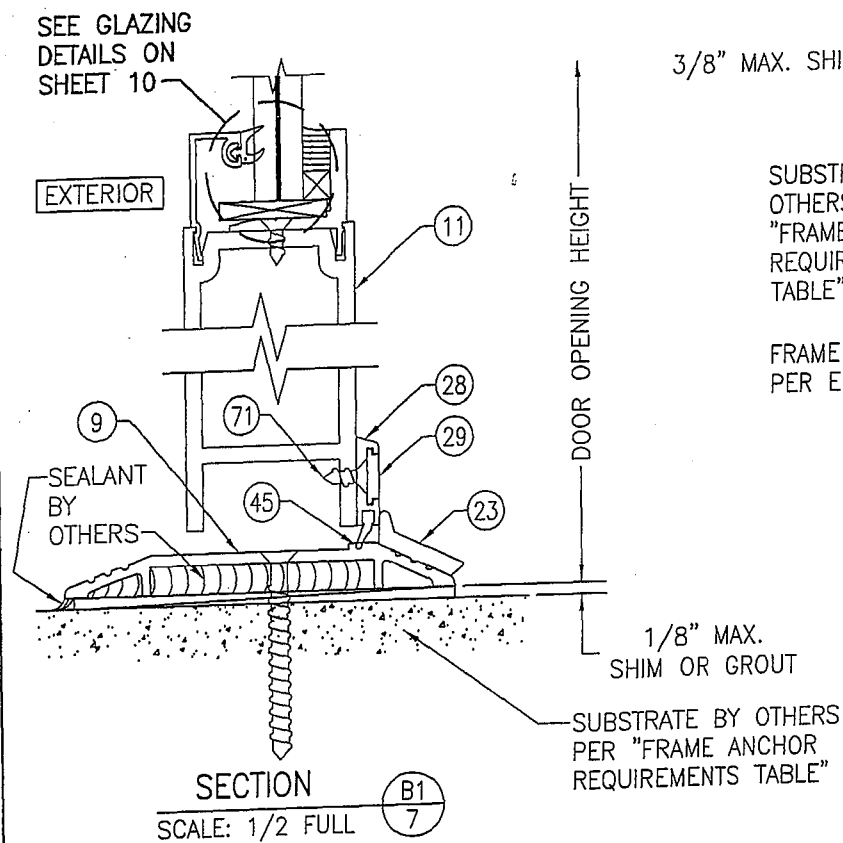
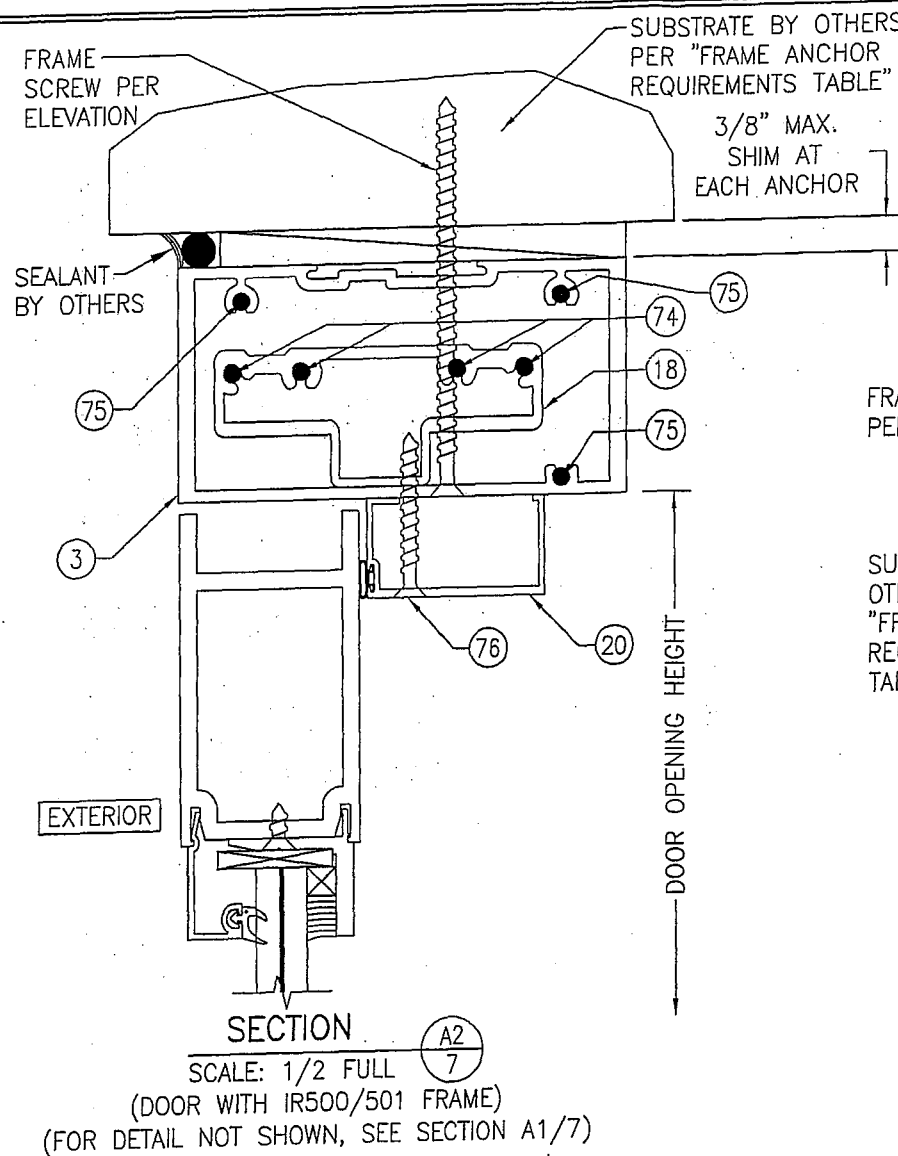
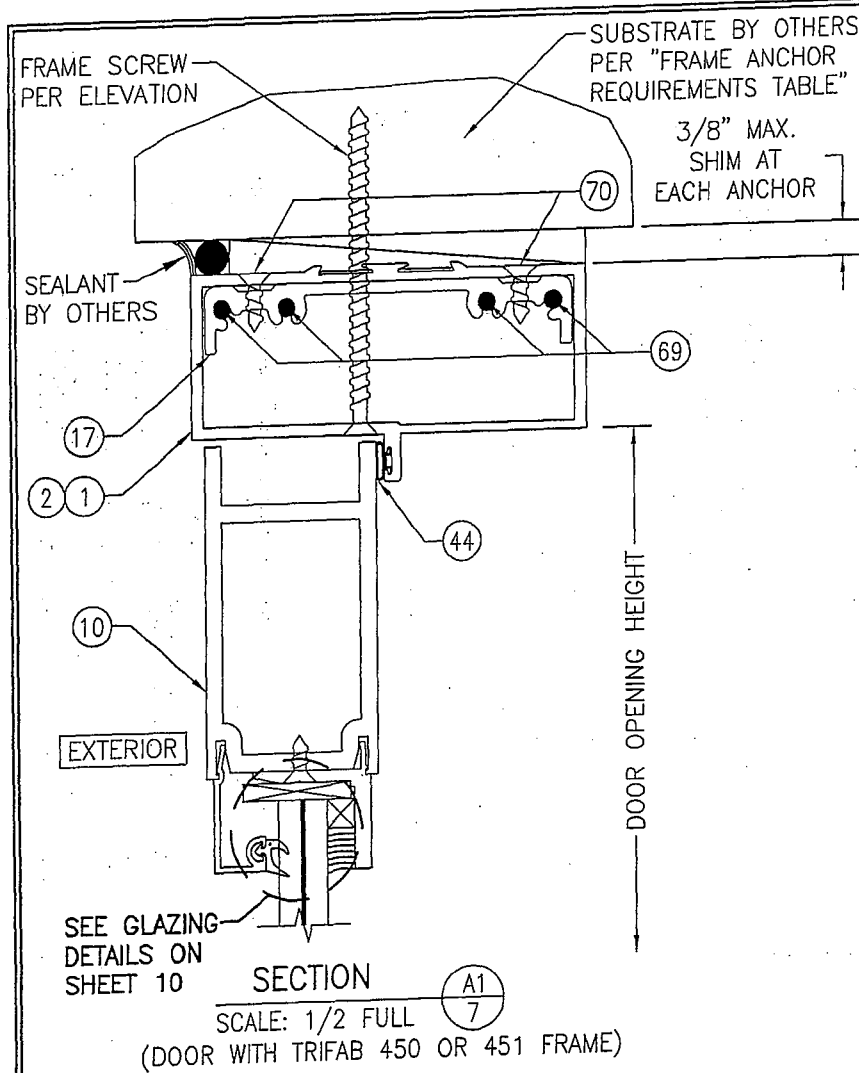
**EXTERIOR ELEVATION:
INSTALLATION REQUIREMENTS FOR SINGLE
DOORS WITH CONTINUOUS HINGE**

SCALE: 1/2" = 1'-0"

(FOR DOOR DETAIL NOT SHOWN, SEE ELEVATIONS ON SHEETS 2 & 3)

THE CONDITIONS SHOWN IN THESE ELEVATIONS CONSIDER THE PERIMETER FRAMING TO BE INSTALLED TO A PUNCHED WALL OPENING OR CURTAIN WALL SYSTEM OPENING. WHEN DOOR PANELS ARE INSTALLED INTO A 450, 451 OR 500/501 STOREFRONT SYSTEM (NOT A PUNCHED OPENING), THE INSTALLATION REQUIREMENTS OF THE STORE FRONT APPROVAL SHALL CONTROL WITH THE DOOR PANELS BEING HINGED AND LOCKED TO THE FRAMING AS SHOWN HERE-IN.

DRAWN BY: W.R.M.		CHECKED BY: W.W.S.	
PLOT: 1=24		DATE: 03/19/13	
NO.	REVISION	DESCRIPTION	DATE
DRAWING TITLE: IR350/500 HW WIND ZONE 4 L.M.I. OUT-SWING DOORS CONSULTANTS: W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) 7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424 JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555			
CERTIFICATION MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497			
DRAWING NO. 1821T		REV.	
SHEET NO. 6		OF 12	



DRAWN BY: W.R.M.		CHECKED BY: W.W.S.	
PLOT: 1=2		DATE: 03/19/13	
NO.	REVISION	DESCRIPTION	DATE
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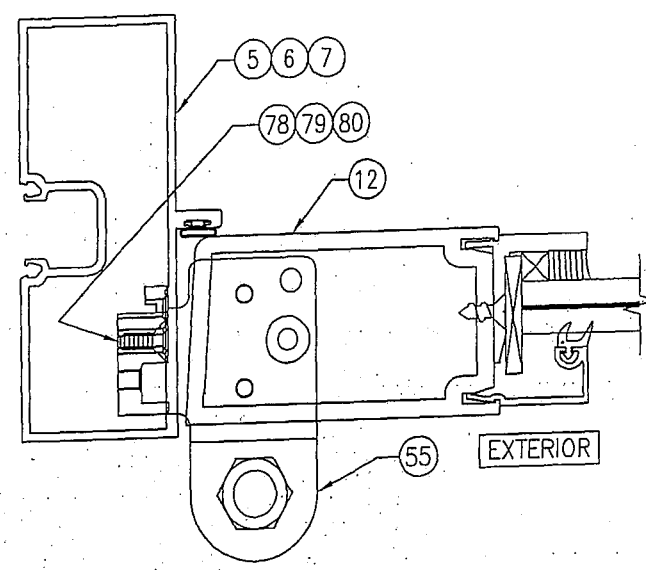
DRAWING TITLE: IR350/500 HW WIND ZONE 4 L.M.I. OUT-SWING DOORS

CONSULTANTS: KAWNEER COMPANY, INC.
555 GUTHRIE COURT
NORCROSS, GA 30092
770-449-5555

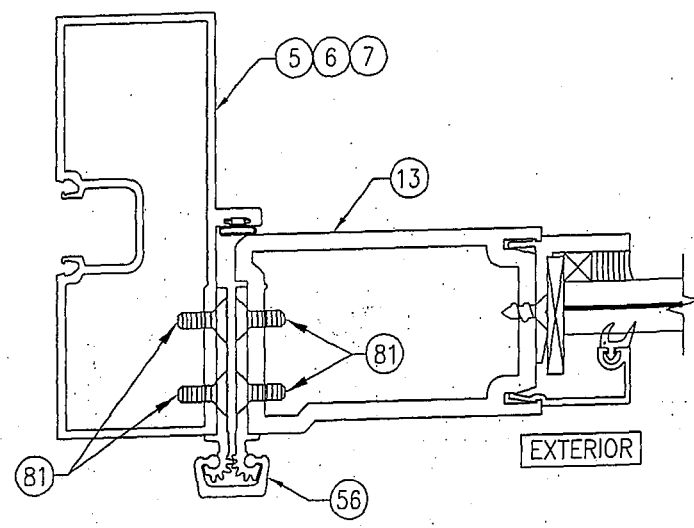
W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980)
7480 150TH COURT NORTH
PALM BEACH GARDENS, FL 33418
PHONE: 561-744-3424

CERTIFICATION: MAR 20 2013
WARREN W. SCHAEFER, P.E.
P.E. NO. 113487

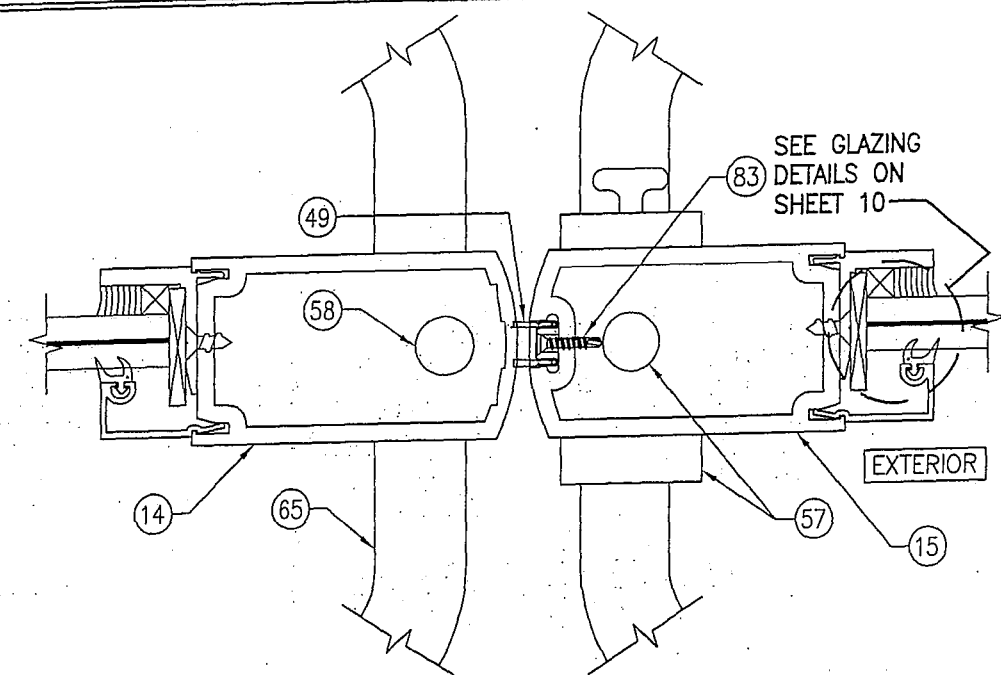
DRAWING NO. 1821T
SHEET NO. 7 OF 12



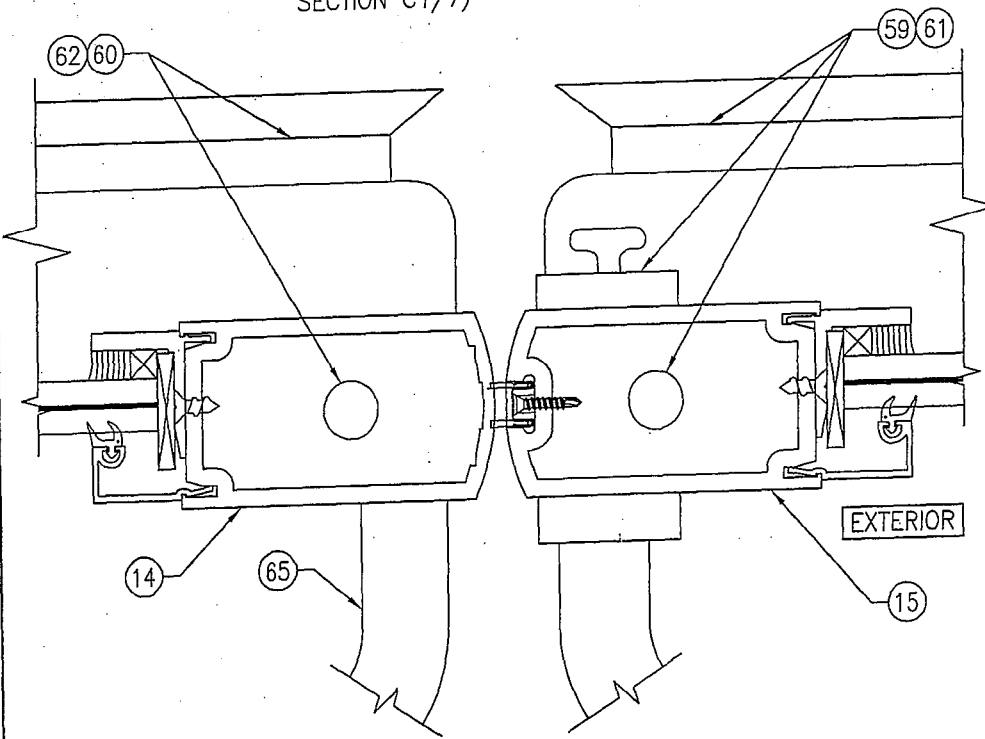
ALTERNATE HINGE SECTION
(PIVOT HINGE CONDITION)
(FOR DETAIL AND INSTALLATION NOT SHOWN, SEE SECTION C1/7)



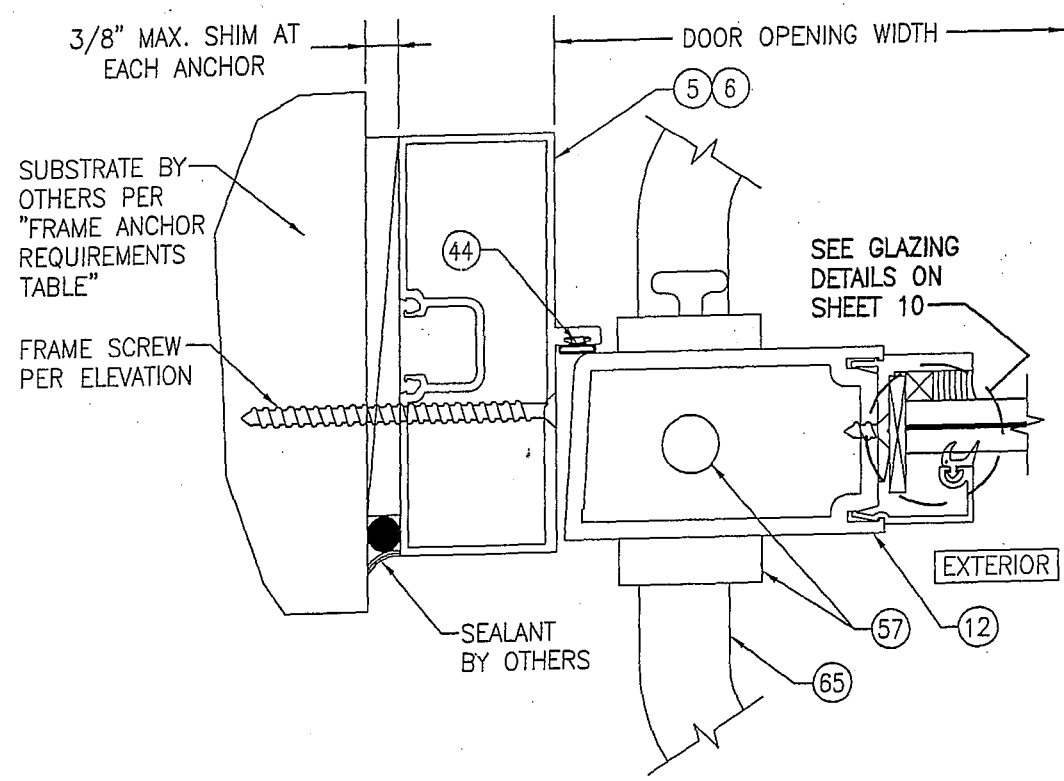
ALTERNATE HINGE SECTION
(CONTINUOUS HINGE CONDITION)
(FOR DETAIL AND INSTALLATION NOT SHOWN, SEE SECTION C1/7)



SECTION D1
8
SCALE: 1/2 FULL
(DOOR WITH LOCK OPTION 1)

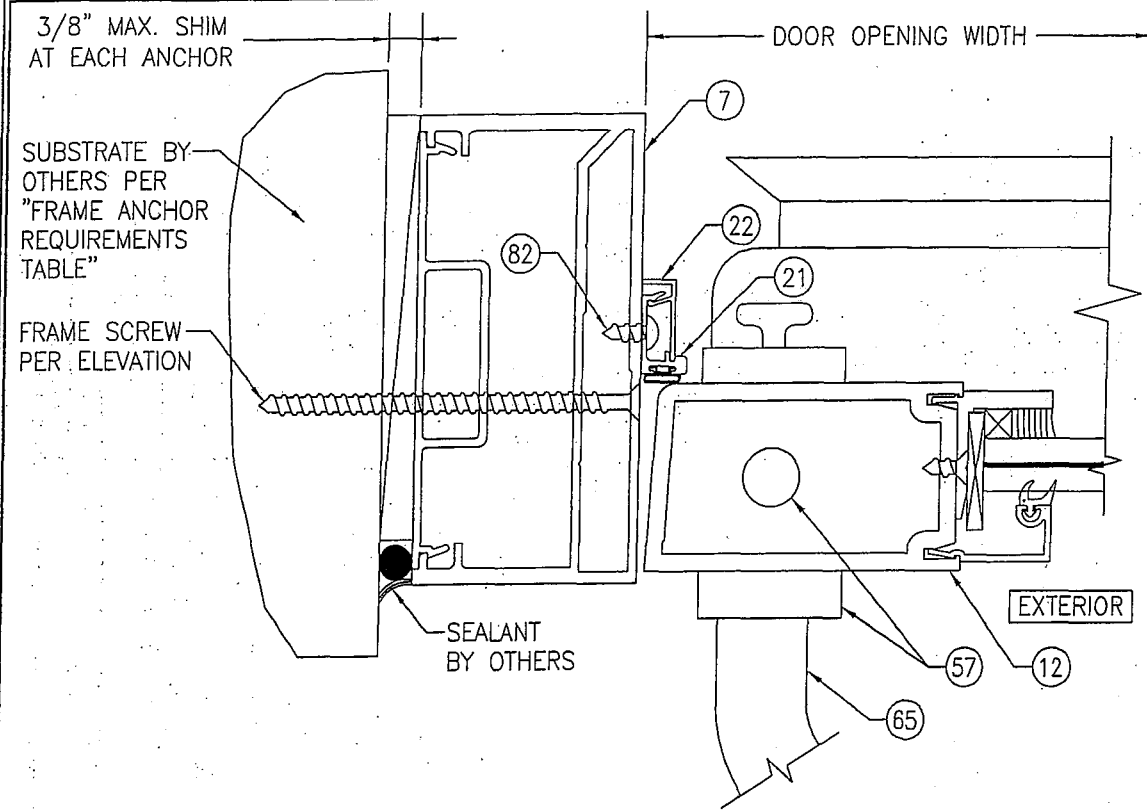


SECTION D2
8
SCALE: 1/2 FULL
(DOOR WITH LOCK OPTIONS 2 & 3)
(FOR DETAIL NOT SHOWN, SEE SECTION D1/8)



SECTION E1
8
SCALE: 1/2 FULL
(DOOR WITH TRIFAB 450 OR 451 FRAME & LOCK OPTION 1. FOR LOCK OPTIONS 2 & 3 SEE ALTERNATE LOCK SECTION ON SHEET 9)

DRAWN BY: W.R.M.		CHECKED BY: W.W.S.			
PLOT: 1=2		DATE: 03/19/13			
NO.		REVISION DESCRIPTION		BY	DATE

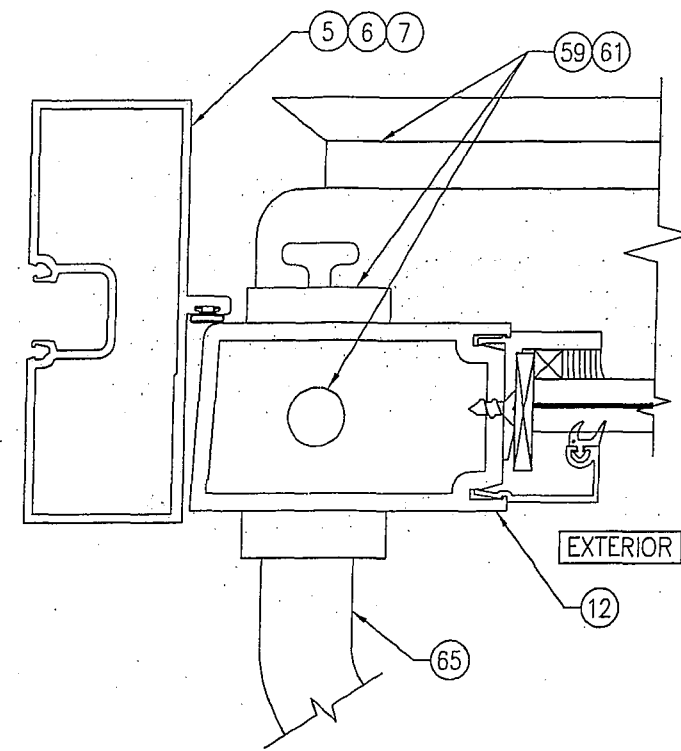


SECTION

SCALE: 1/2 FULL

E2
9

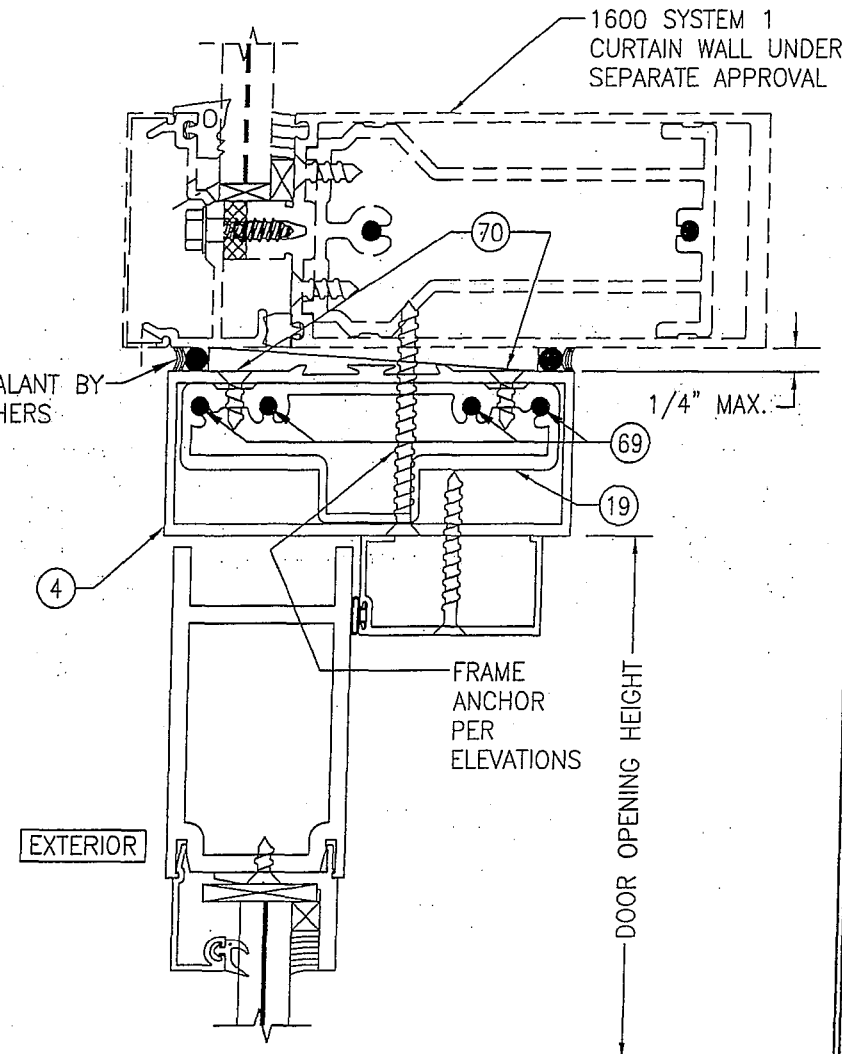
(DOOR WITH IR500/501 FRAME & LOCK OPTION 1. FOR LOCK OPTIONS 2 & 3 SEE ALTERNATE LOCK SECTION ON THIS SHEET)
(FOR DETAIL NOT SHOWN, SEE SECTION E1/8)



ALTERNATE LOCK SECTION

(LOCK OPTIONS 2 & 3)

(FOR DETAIL AND INSTALLATION NOT SHOWN, SEE SECTION E1/8)

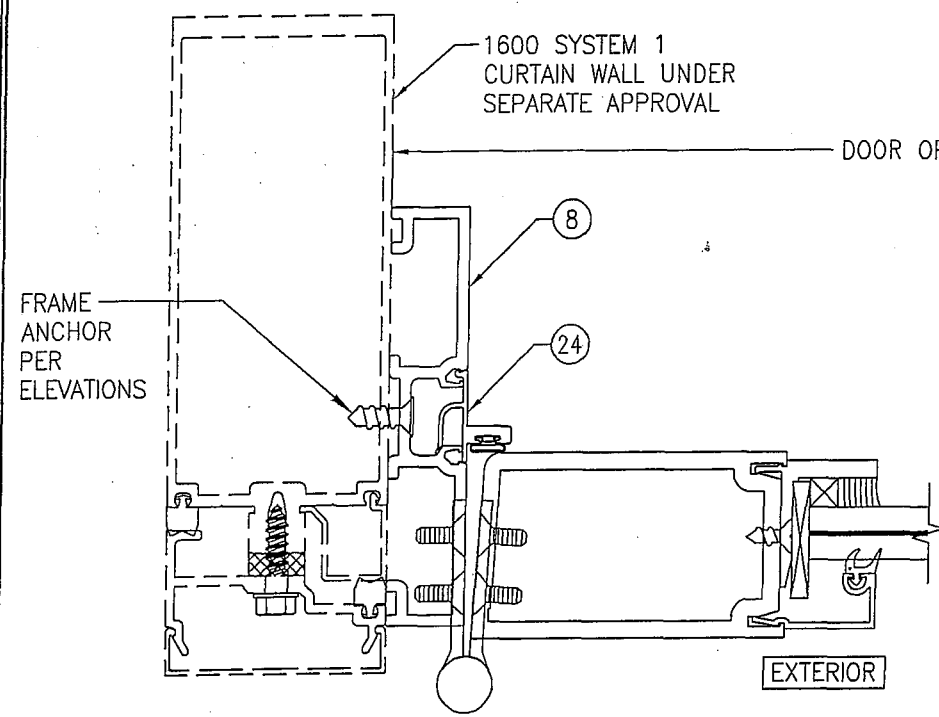


SECTION

SCALE: 1/2 FULL

F
9

(FOR DETAIL NOT SHOWN, SEE OTHER SECTIONS)

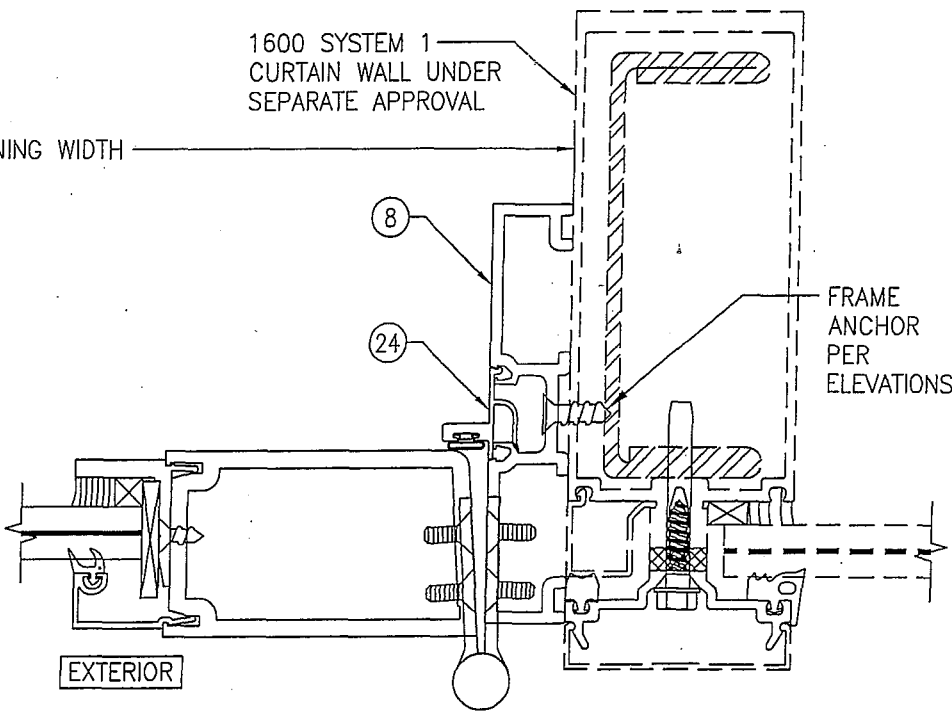


SECTION

SCALE: 1/2 FULL

G
9

(BUTT HINGE CONDITION SHOWN. PIVOT AND CONTINUOUS HINGE CONDITIONS ALSO APPLY)
(FOR DETAIL NOT SHOWN, SEE OTHER SECTIONS)



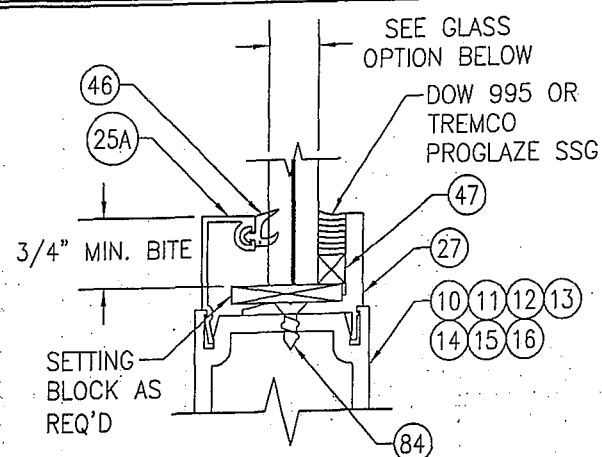
SECTION

SCALE: 1/2 FULL

H
9

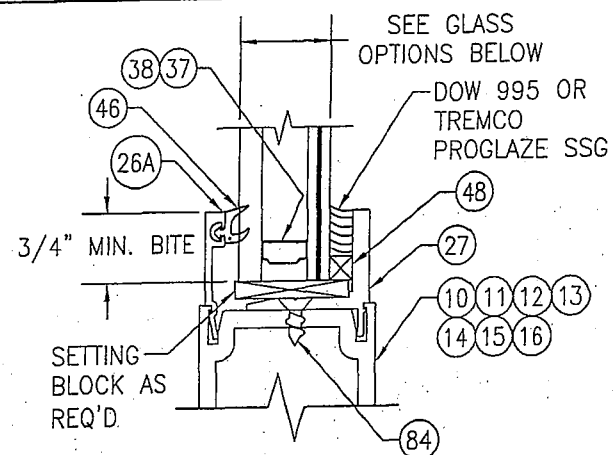
(BUTT HINGE CONDITION SHOWN. PIVOT AND CONTINUOUS HINGE CONDITIONS ALSO APPLY)
(FOR DETAIL NOT SHOWN, SEE OTHER SECTIONS)

DRAWING TITLE	IR350/500 HW WIND ZONE 4 L.M.I. OUT-SWING DOORS		DRAWN BY: W.R.M.		CHECKED BY: W.W.S.	
			PLOT: 1=2		DATE: 03/19/13	
			NO.		REVISION	
			BY		DATE	
CONSULTANTS			JOB INFORMATION:			
			KAWNEER COMPANY, INC.			
			555 GUTHRIE COURT			
			NORCROSS, GA 30092			
DRAWING NO.			7490 150TH COURT NORTH			
			PALM BEACH GARDENS, FL 33418			
			PHONE: 561-744-3424			
SHEET NO.			WARREN W. SCHAEFER, P.E.			
			P.E. NO. 113497			



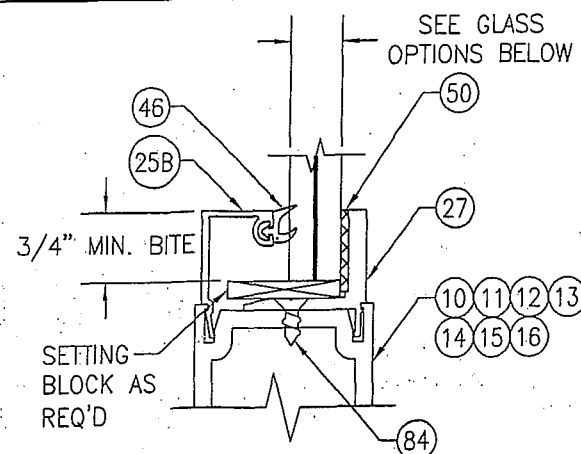
TYPICAL MONOLITHIC GLAZING DETAIL

GLASS OPTION: (WET GLAZED)
 OPTION 1: 9/16" THICK LAMINATED GLASS (1/4" HT. ST./0.090" DUPONT SG/1/4" HT. ST.)



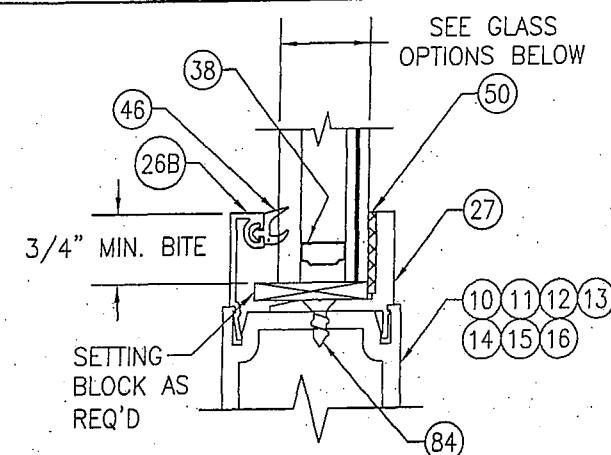
TYPICAL I.G. GLAZING DETAIL

GLASS OPTIONS: (WET GLAZED)
 OPTION 2: 1" THICK I.G. LAMINATED GLASS (1/4" TEMP EXTERIOR; 1/2" AIR SPACE; 1/8" HT. ST./0.090" DUPONT SG/1/8" HT. ST. INTERIOR)
 OPTION 5: 1" THICK I.G. LAMINATED GLASS (1/4" TEMP EXTERIOR; 1/4" AIR SPACE; 3/16" HT. ST./0.180" DUPONT SG/3/16" HT. ST. INTERIOR)



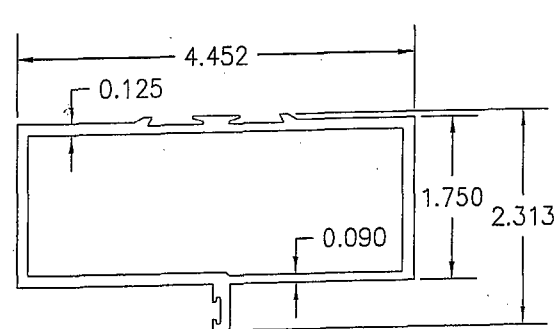
TYPICAL MONOLITHIC GLAZING DETAIL (TAPE GLAZED)

GLASS OPTIONS:
 OPTION 3 9/16" THICK LAMINATED GLASS (1/4" HT. ST./0.090" DUPONT BUTACITE PVB/1/4" HT. ST.)

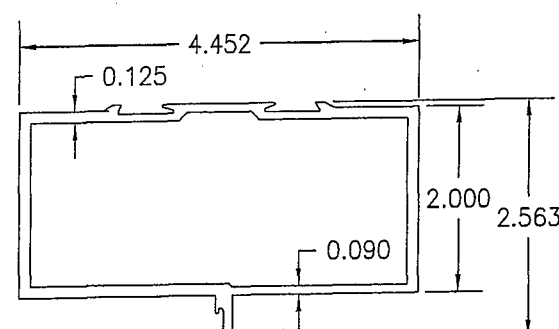


TYPICAL I.G. GLAZING DETAIL

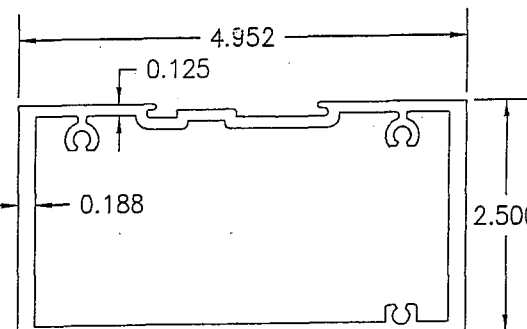
GLASS OPTIONS: (TAPE GLAZED)
 OPTION 4: 1" THICK I.G. LAMINATED GLASS (1/4" TEMP EXTERIOR; 1/2" AIR SPACE; 1/8" HT. ST./0.090" DUPONT BUTACITE PVB/1/8" HT. ST. INTERIOR)



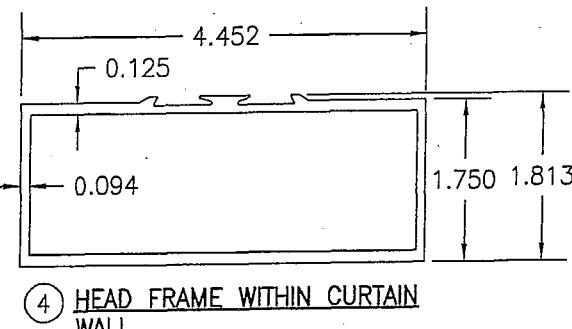
① TRIFAB 450 HEAD FRAMING



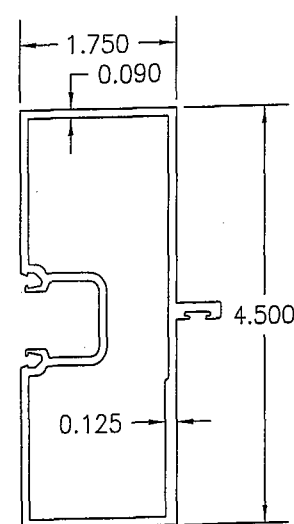
TRIFAB 451 HEAD FRAMING ②



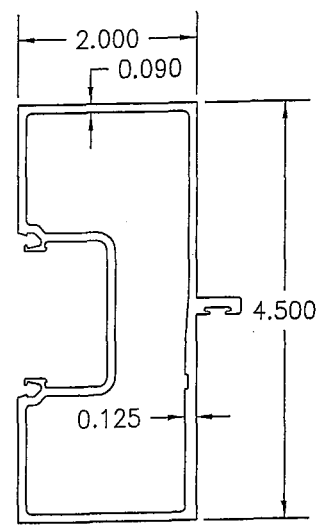
③ IR500/501 HEAD FRAMING



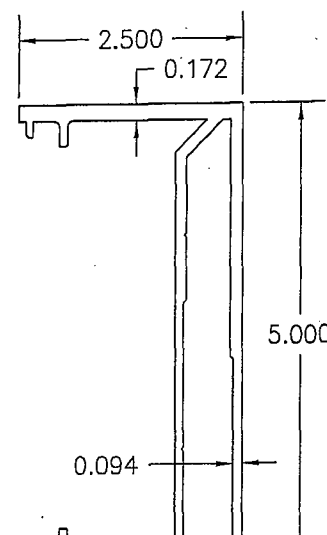
④ HEAD FRAME WITHIN CURTAIN WALL



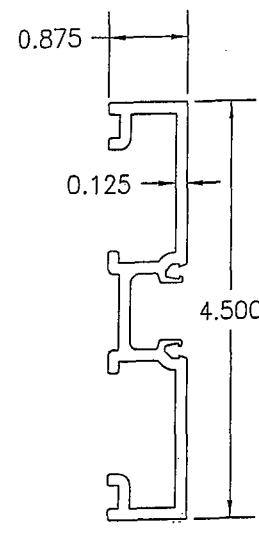
⑤ TRIFAB 450 JAMB FRAMING



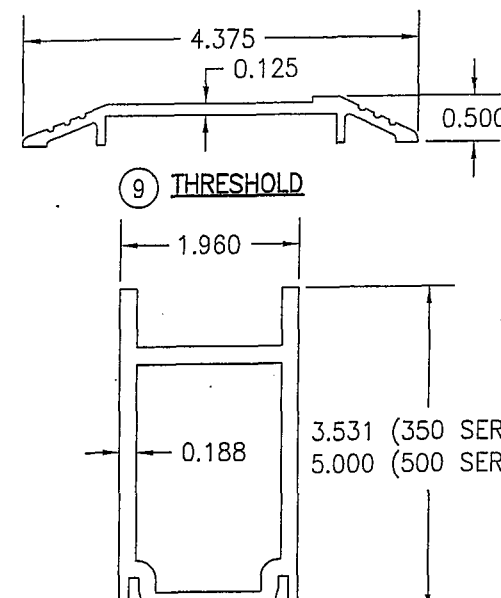
⑥ TRIFAB 451 JAMB FRAMING



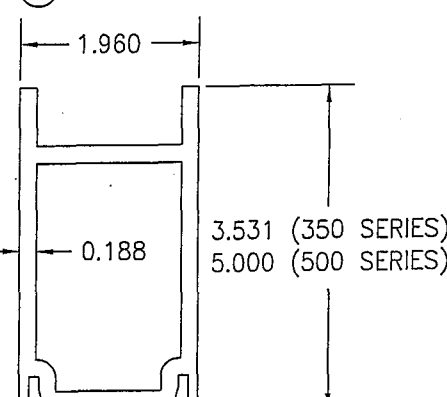
⑦ IR500/501 JAMB FRAMING



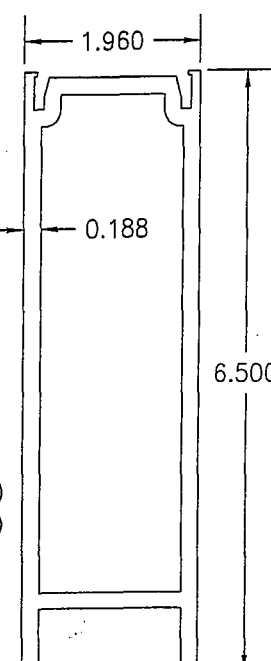
⑧ DOOR ADAPTOR WITHIN CURTAIN WALL SYSTEM



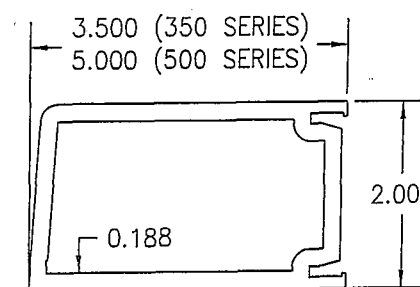
⑨ THRESHOLD



⑩ TOP RAIL

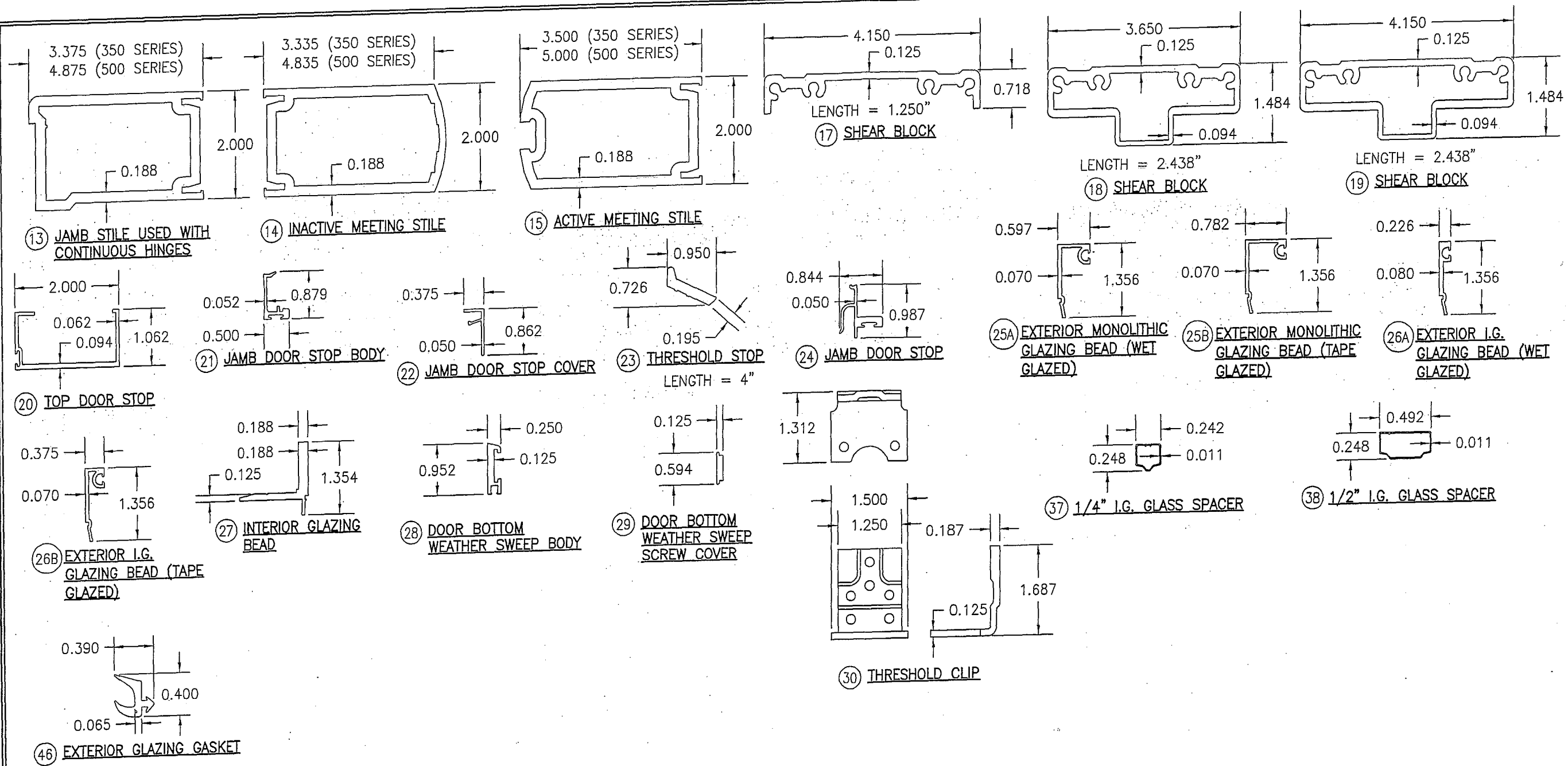


⑪ BOTTOM RAIL



⑫ JAMB STILE USED WITH BUTT OR PIVOT HINGES

DRAWN BY: W.R.M.		CHECKED BY: W.W.S.	
PLOT: 1=2		DATE: 03/19/13	
DATE	BY	REVISION DESCRIPTION	NO.
DRAWING TITLE: IR350/500 HW WIND ZONE 4 L.M.I. OUT-SWING DOORS CONSULTANTS: W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) 7480 150TH COURT NORTH, PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424 JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555			
CERTIFICATION: MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497			
DRAWING NO. 1821T		REV.	
SHEET NO. 10		OF 12	



DRAWN BY: W.R.M.		CHECKED BY: W.W.S.	
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DRAWING TITLE: IR350/500 HW WIND ZONE 4 L.M.I. OUT-SWING DOORS CONSULTANTS: W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) 7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424 KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555			
CERTIFICATION MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497			
DRAWING NO. 1821T		REV.	
SHEET NO. 11		OF 12	

ITEM #			ITEM DESCRIPTION			MANUFACTURER/NOTES		
PARTS								
1	TRIFAB 450 HEAD FRAMING	6063-T6 ALUMINUM						
2	TRIFAB 451 HEAD FRAMING	6063-T6 ALUMINUM						
3	IR500/501 HEAD FRAMING	6063-T6 ALUMINUM						
4	HEAD FRAME WITHIN CURTAIN WALL SYSTEM	6063-T6 ALUMINUM						
5	TRIFAB 450 JAMB FRAMING	6063-T6 ALUMINUM						
6	TRIFAB 451 JAMB FRAMING	6063-T6 ALUMINUM						
7	IR500/501 JAMB FRAMING	6063-T6 ALUMINUM						
8	DOOR ADAPTOR WITHIN CURTAIN WALL SYSTEM	6063-T6 ALUMINUM						
9	THRESHOLD	6063-T6 ALUMINUM						
10	TOP RAIL	6063-T6 ALUMINUM						
11	BOTTOM RAIL	6063-T6 ALUMINUM						
12	JAMB STILE USED WITH BUTT OR PIVOT HINGES	6063-T6 ALUMINUM						
13	JAMB STILE USED WITH CONTINUOUS HINGES	6063-T6 ALUMINUM						
14	INACTIVE MEETING STILE	6063-T6 ALUMINUM						
15	ACTIVE MEETING STILE	6063-T6 ALUMINUM						
17	SHEAR BLOCK	6063-T6 ALUMINUM						
18	SHEAR BLOCK	6063-T6 ALUMINUM						
19	SHEAR BLOCK	6063-T6 ALUMINUM						
20	TOP DOOR STOP	6063-T6 ALUMINUM						
21	JAMB DOOR STOP BODY	6063-T6 ALUMINUM						
22	JAMB DOOR STOP COVER	6063-T6 ALUMINUM						
23	THRESHOLD STOP	6063-T6 ALUMINUM (PLACED @ MID-SPAN OF SILL)						
24	JAMB DOOR STOP	6063-T6 ALUMINUM						
25A	EXTERIOR MONOLITHIC GLAZING BEAD (WET GLAZED)	6063-T6 ALUMINUM						
25B	EXTERIOR MONOLITHIC GLAZING BEAD (TAPE GLAZED)	6063-T6 ALUMINUM						
26A	EXTERIOR I.G. GLAZING BEAD (WET GLAZED)	6063-T6 ALUMINUM						
26B	EXTERIOR I.G. GLAZING BEAD (TAPE GLAZED)	6063-T6 ALUMINUM						
27	INTERIOR GLAZING BEAD	6063-T6 ALUMINUM						
28	DOOR BOTTOM WEATHER SWEEP BODY	6063-T6 ALUMINUM						
29	DOOR BOTTOM WEATHER SWEEP SCREW COVER	6063-T6 ALUMINUM						
30	THRESHOLD CLIP	1010-1020 H.R. STEEL						
37	1/4" I.G. GLASS SPACER	3005 OR 3105 ALUMINUM						
38	1/2" I.G. GLASS SPACER	3005 OR 3105 ALUMINUM						
SEALS & SEALANTS								
44	DOOR BULB WEATHERING	ALCRYN DUROMETER 70 +/-5 & RIGID PVC						
45	DOOR SWEEP	NEOPRENE						
46	EXTERIOR GLAZING GASKET	TREMCO TR-13536E EPDM DUROMETER 70 +/-5						
47	5/16" X 5/16" GLAZING TAPE	POLYURETHANE FAOM DUROMETER 30 +/-5						
48	1/4" X 1/4" GLAZING TAPE	POLYURETHANE FAOM DUROMETER 30 +/-5						
49	ADJUSTABLE ASTRAGAL WEATHERING	5052-H32 ALUMINUM/NYLON/POLYURETHANE/EPDM						
50	0.090" X 0.875" GLAZING TAPE	3M CONFORMABLE ACRYLIC FOAM						
HARDWARE								
54	BUTT HINGE	HAGER 037-264						
55	TOP OFFSET PIVOT HINGE	KAWNEER NO. 050-322						
	INTERMEDIATE PIVOT HINGE	KAWNEER NO. 037-233/037-234						
	BOTTOM OFFSET PIVOT HINGE	KAWNEER NO. 050-326/050-327						
56	CONTINUOUS HINGE	HAGER/ROTON 050-820						

ITEM #			ITEM DESCRIPTION			MANUFACTURER/NOTES		
HARDWARE CONTINUED								
57	ACTIVE DOOR LOCK ASSEMBLY (LOCK OPTION 1)	ADAMS-RITE 1850 3-POINT LOCK SYSTEM WITH KAWNEER'S CYLINDER, THUMBTURN & PUSH PACKAGE						
58	INACTIVE DOOR LOCK ASSEMBLY (LOCK OPTION 1)	ADAMS-RITE FLUSH BLOTS 50-079 TOP FLUSH BOLT 50-075 BOTTOM FLUSH BOLT						
59	ACTIVE DOOR LOCK ASSEMBLY (LOCK OPTION 2)	KAWNEER 1686 PANIC DEVICE SYSTEM WITH KAWNEER'S DEADBOLT (PANIC DEVICE ACTUATES TOP & BOTTOM SHOOTBOLTS)						
60	INACTIVE DOOR LOCK ASSEMBLY (LOCK OPTION 2)	KAWNEER 1686 PANIC DEVICE (PANIC DEVICE ACTUATES TOP & BOTTOM SHOOTBOLTS)						
61	ACTIVE DOOR LOCK ASSEMBLY (LOCK OPTION 3)	FALCON HH 1690 OR VON DUPRIN HH9947 CONSEALED VERTICAL ROD PANIC DEVICE SYSTEM WITH SCHLAGE'S DEADBOLT (PANIC DEVICE ACTUATES TOP & BOTTOM SHOOTBOLTS)						
62	INACTIVE DOOR LOCK ASSEMBLY (LOCK OPTION 3)	FALCON HH 1690 OR VON DUPRIN HH9947 CONSEALED VERTICAL ROD PANIC DEVICE SYSTEM (PANIC DEVICE ACTUATES TOP & BOTTOM SHOOTBOLTS)						
65	PUSH-PULL HANDLE	AS REQ'D						
FASTENERS								
69	NO. 10 X 1 19/32" PHTF SCREW	4 PER SHEAR BLOCK						
70	NO. 10 X 9/16" FHTF SCREW	2 PER SHEAR BLOCK						
71	NO. 6 X 3/8" FHTF SCREW	WITHIN 2" FROM ENDS & 10" MAX. O.C.						
74	NO. 12 X 1 7/8" FHTF SCREW	4 PER SHEAR BLOCK						
75	NO. 12 X 1" PHTF SCREW	3 PER HORIZONTAL						
76	NO. 8 X 3/8" PHTF SCREW	WITHIN 1" FROM ENDS & 16" MAX. O.C.						
77	NO. 12-24 X 9/16" SCREW	8 PER HINGE						
78	5/16"-18 X 5/8" SCREW	2 PER TOP PIVOT HINGE						
79	NO. 12-24 X 9/16" SCREW	2 PER INTERMEDIATE PIVOT HINGE						
80	1/4-20 X 3/8" SCREW	3 PER BOTTOM PIVOT HINGE						
81	NO. 12-24 X 13/32" SCREW	2 9/16" FROM ENDS & 5 1/8" MAX. O.C.						
82	NO. 8 X 3/8" FHTF SCREW	WITHIN 1" FROM ENDS & 9" MAX. O.C.						
83	NO. 6-18 FHTF SCREW	10 PER LEAF						
84	NO. 10 X 1/2" FHTF SCREW	WITHIN 3" FROM ENDS & 11 1/8" MAX. O.C.						

DRAWING TITLE

IR350/500 HW WIND ZONE 4 L.M.I. OUT-SWING DOORS

CONSULTANTS

W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980)

7480 150TH COURT NORTH
PALM BEACH GARDENS, FL 33418
PHONE: 561-744-3424

CERTIFICATION

MAR 20 2013

WARREN W. SCHAEFER, P.E.
P.E. NO. 113497

DRAWING NO.

1821T

REV.

SHEET NO.

12 OF 12

DRAWN BY:

W.R.M.

CHECKED BY:

W.W.S.

PLOT:

1=2

DATE:

03/19/13

DATE

BY

REVISION DESCRIPTION

NO.

JOB INFORMATION:

KAWNEER COMPANY, INC.
555 GUTHRIDGE COURT
NORCROSS, GA 30092
770-449-5555

Bullet Proof Transaction Window



INTERIOR TRANSACTION WINDOW PBITW

RECOMMENDED USES

Cash payment windows
Reception/Interview windows
Ticket windows

AVAILABLE SIZES

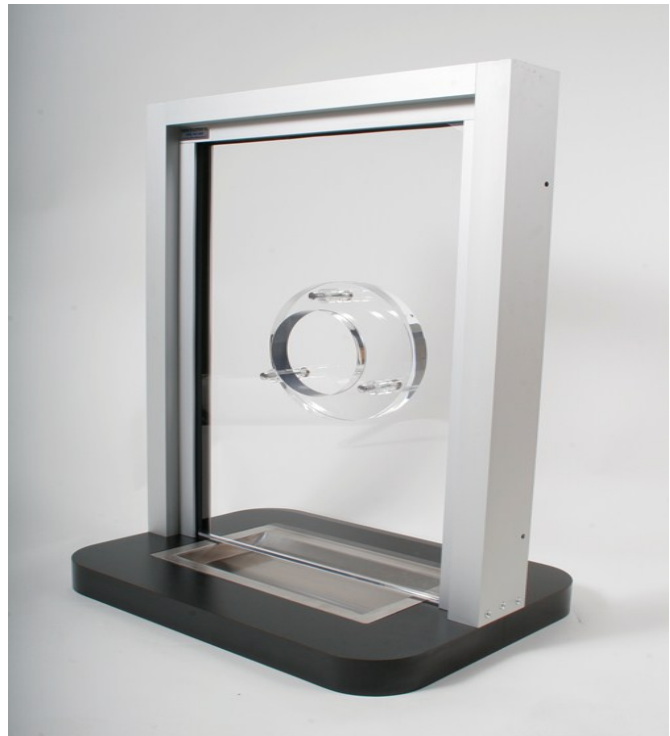
24x36	30x36	30x42	72x42
36x36	36x42	48x36	72x36
48x42	60x36	60x42	

GLAZING MATERIAL OPTIONS

Level 1 1-1/4" Acrylic
1- 1/4" SAR Coated Acrylic
3/4" MP750
1-3/16" BR Glass

Level 2 1-3/8" Acrylic
Glass Clad Polycarbonate

Level 3 1-1/4" Polycarbonate



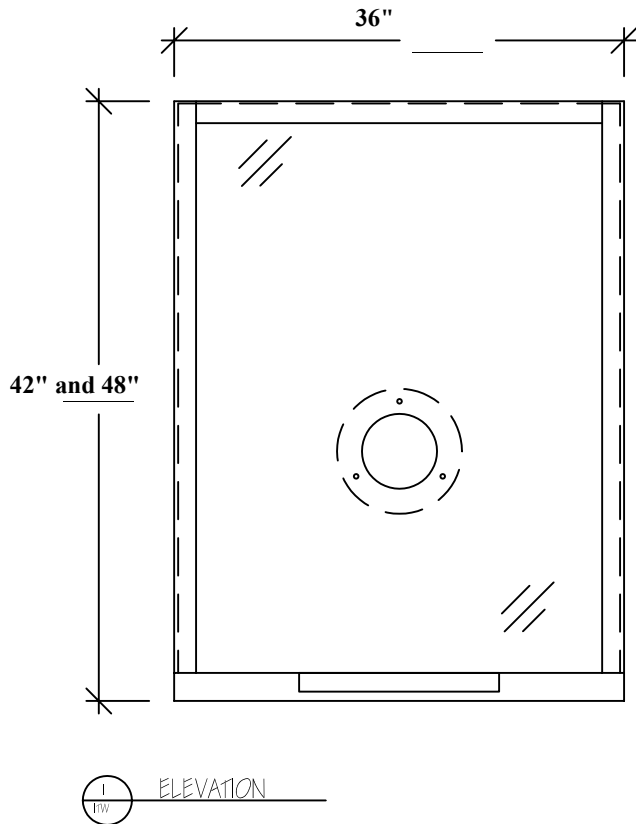
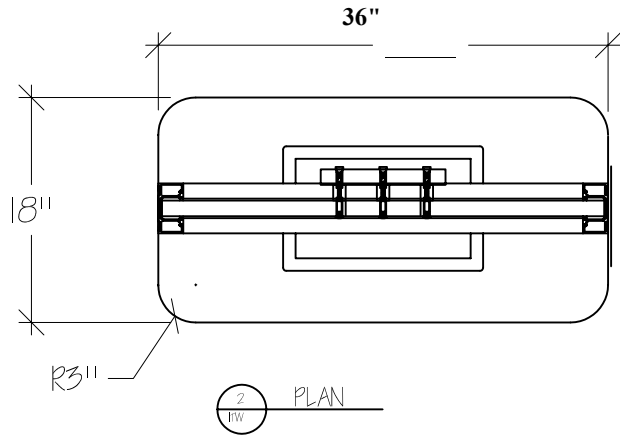
FEATURES

Available in bronze or clear anodized
Black Plastic laminate base with 16 x 10 x 1-1/2" recessed stainless steel cash tray
Delivered assembled & ready for installation
Quick ship item (within one week)
Forced entry option available
For interior applications
Available in Levels 1, 2, & 3

www.pacificbulletproof.com (888) 358-2309

PBITW

INTERIOR TRANSACTION WINDOW
APPROVAL DRAWING



LEVEL OF PROTECTION

- ☒ LEVEL 1 ACRYLIC
☐ LEVEL 2 ACRYLIC
☐ LEVEL 3 POLYCARBONATE
☐ OTHER _____

FRAME COLOR

- ☒ CLEAR ANODIZED
☐ BRONZE ANODIZED
☐ OTHER _____

COUNTERTOP COLOR

- ☒ STANDARD BLACK
☐ OTHER _____

INCLUDES: 16" x 10" x 1-1/2" Stainless Steel drop in deal tray

TALK THRU

- ☒ STANDARD 6" HOLE WITH 10" ACRYLIC / POLYCARBONATE BACKER
☐ 6-FR STAINLESS STEEL
☐ SC-100 ELECTRONIC INTERCOM
☐ 6-D STAINLESS STEEL
☐ 5-D STAINLESS STEEL
☐ OTHER _____

QUANTITY: 1

PROP#

CUSTOMER

APPROVED BY

X

JOB#

SALES REP

DATE:

X



Pattern Reference



Actual Size



Impulse III Modular (7246)

Product Quick Specs

Style Name/Number	Impulse III Modular 7246
Color Name/Number	Roll The Dice 1431
Construction	Level Loop
Selected Backing	Nexus® Modular
Dye Method	Solution/Yarn Dyed
Fiber Type	Encore® BCF (with recycled content)
Face Weight	21 oz./sy (712 grams/m2)
Pile Density	7061 oz./y3 (261.83 kg/m3)
Gauge	1/10 (3.94 rows/cm)
Stitches	8.5 stitches/in (3.35 stitches/cm)
Standard Size	24" x 24" approx. 60.96cm x 60.96cm
Smoke Density	Less then 450 flaming
Static Test	Less then 3 kv

Warranties

Lifetime Fiber Performance for Wear; Lifetime for Tuft Bind Strength (edge ravel, yarn pulls, zippering); Lifetime Protection from Delamination Failure; Lifetime Fiber Performance for Static; Lifetime Moisture Barrier; Lifetime Dimensional Stability



Products Installed

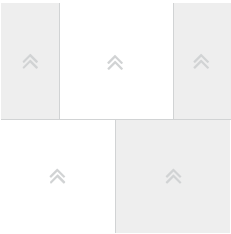


Impulse III Modular 7246
Modular
1431 Roll The Dice

INVISION

ARCHITECT TO
SELECT COLOR
FROM
MANUFACTUER'S
COLOR
SELECTION

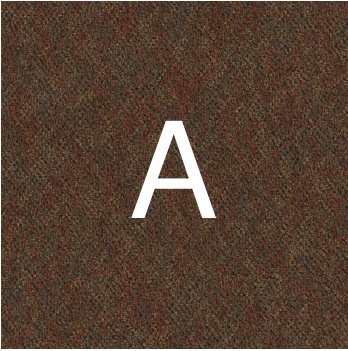
Installation Method



Brick (24x24)

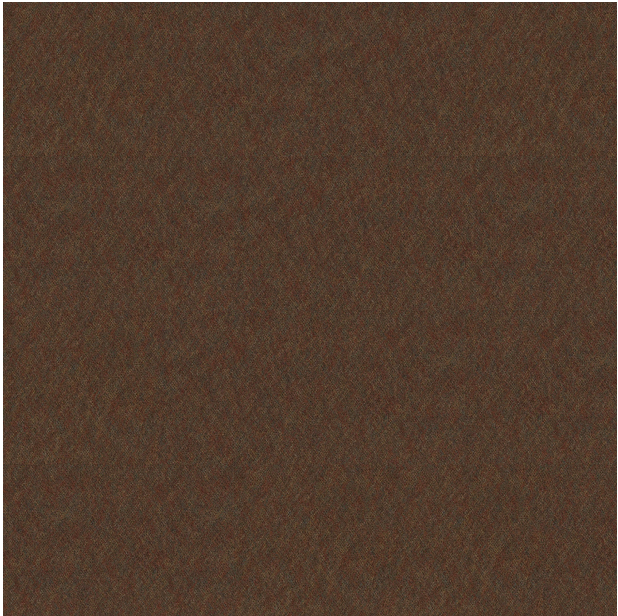
This three dimensional rendering is for visualization purposes only and may not be an exact representations of the selected products. Pile heights may vary from product to product and adhesive requirements may vary depending on product selection. The review of actual product samples are recommended before final selection. Please contact your J+J Flooring Group sales representative with any questions. This unique carpet design is protected under the U.S. Copyright Act of 1976. Any unauthorized copying or duplication of this design constitutes copyright infringement in violation of federal law.

Keys

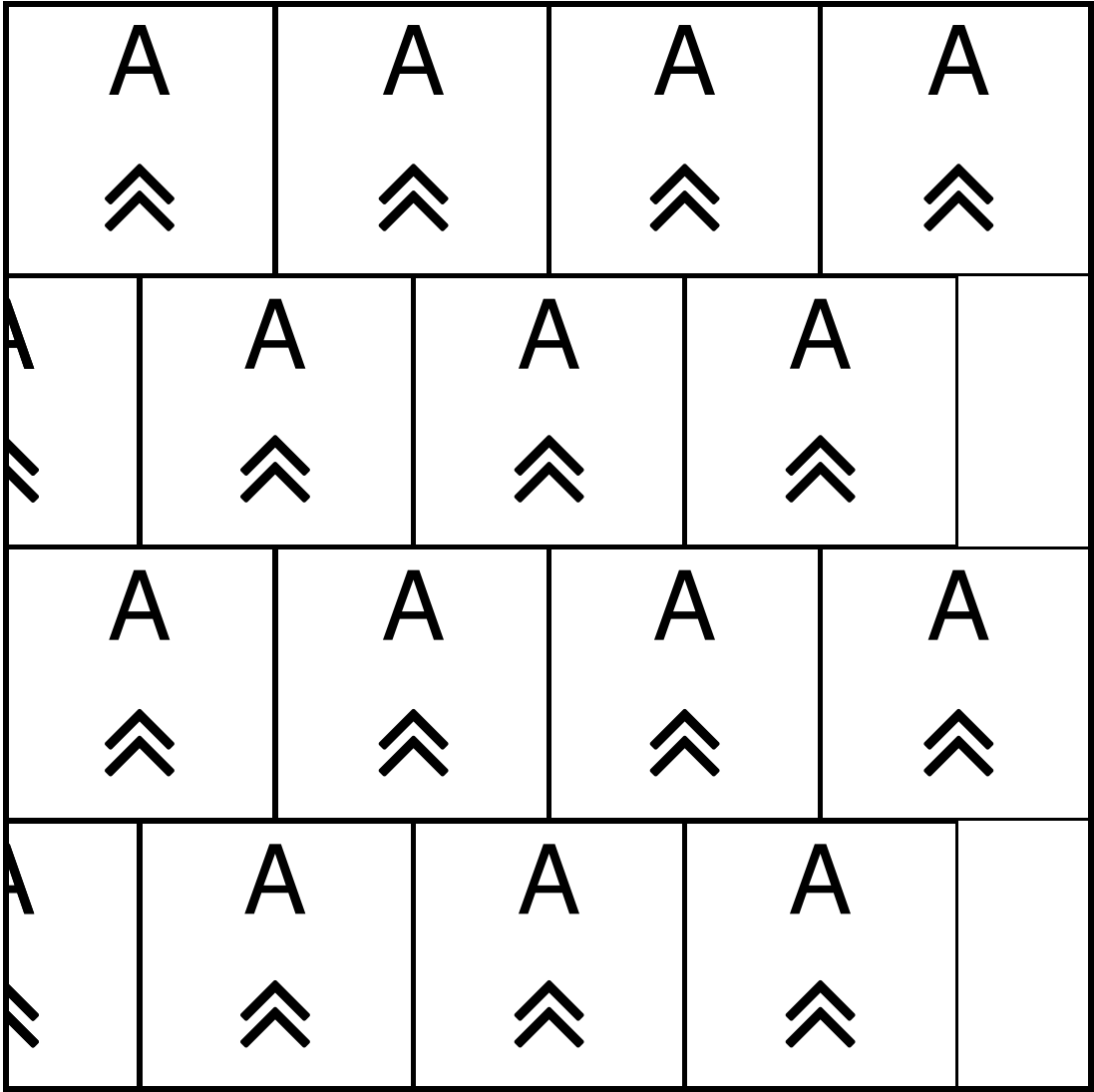


Impulse III Modular 7246
Modular
1431 Roll The Dice

INVISION



Pattern Diagram



Diebold Cash Tray Drawer



List Price: ~~\$155.40~~

Web Price: From \$148.00 to \$173.49

Manufacturer: Diebold, Inc.

Manufacturer Part #: 00022025077A

Product Options

Core
Install
Key:

Core
Lock:

Quantity:

Diebold Cash Tray Drawer

Install a Diebold cash tray drawer or filing drawer under almost any counter top. Ideal for teller stations at bank and credit union branches.

- Both the 00022083000A and 00022080000A Diebold Cash Tray Kits can easily be placed into these apron cash tray cash drawers
- This teller drawer is made of recyclable steel
- Color: Platinum
- Diebold installation available
- Dimensions: Inside: 16.13"W x 5.34"H x 15.41"D Outside: 18.69"W x 7.45"H x 18.69"D
- Note: The Diebold Cash Tray Drawer is not eligible for the [Undercounter Cabinet](#) free ground shipping offer.

Standard Specifications

SECTION 04720 governs the specifications for the manufacturing processes used to produce architectural cast stone. Christopher Stuart Cast Stone complies with the following specifications.

SECTION 04720 ARCHITECTURAL CAST STONE

This section covers architectural Cast Stone as manufactured by Christopher Stuart Cast Stone, Ltd. Cast stone is a highly refined architectural precast concrete product manufactured to simulate natural cut stone and is applied to unit masonry applications. Cast Stone is a masonry product, used as an architectural feature, trim, ornament or facing for buildings or other structures.

Christopher Stuart Cast Stone, Ltd., uses the Vibrant Dry Tamp Casting Method. This casting method uses carefully graded aggregates and less water than architectural precast concrete using the Wet Casting Method. The benefits include a fine grained texture and the total absence of bug holes. The benefits result in a cast stone product that closely resembles natural cut stone.

PART 1 - GENERAL

1.1. SECTION INCLUDES - Architectural Cast Stone.

Scope - All labor, materials and equipment to provide the Cast Stone shown on architectural drawings and as described in this specification.

Manufacturer shall furnish Cast Stone covered by this specification.

Installing contractor shall unload, store, furnish all anchors, set, patch, clean and seal (optional) the Cast Stone as required.

1.2. RELATED SECTIONS

Section – 01 33 00 – Submittal Procedures

Section – 04 05 13 – Masonry Mortaring

Section – 04 05 16 – Masonry Grouting.

Section – 04 05 19 – Masonry Anchorage and Reinforcing

Section – 07 90 00 – Joint Protection

1.3. REFERENCES

ACI 318 – Building Code Requirements for Reinforced Concrete.

ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Reinforced Concrete.

ASTM C 33 – Standard Specification for Concrete Aggregates.

ASTM C 150 - Standard Specification for Portland Cement.

ASTM C 270 - Standard Specification for Mortar for Unit Masonry.

ASTM C 494/C 494M - Standard Specification for Chemical Admixtures for Concrete.

ASTM 642 – Standard Test Method for Specific Gravity, Absorption, and Voids in Hardened Concrete.

ASTM C 979 - Standard Specification for Coloring Pigments for Integrally Pigmented Concrete.

ASTM C 989 – Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete.

ASTM C 1194 - Standard Test Method for Compressive Strength of Architectural Cast Stone.

ASTM C 1195 - Standard Test Method for Absorption of Architectural Cast Stone.

ASTM C 1364 - Standard Specification for Architectural Cast Stone.

ASTM D 2244 – Standard Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.

Cast Stone Institute® Technical Manual (Current Edition)

1.4. DEFINITIONS

Cast Stone: a refined architectural concrete stone product manufactured to simulate natural cut stone, used in unit masonry applications.

Vibrant Dry Tamp (VDT) casting method: Vibratory ramming of earth moist, zero- slump concrete against a rigid mold until it is densely compacted.

1.5. SUBMITTAL PROCEDURES

Christopher Stuart Cast Stone Comply with Section 01 33 00 – Submittal Procedures.

Samples: Submitted samples are representative of the general range of finish and color proposed for the project.

Test results: Christopher Stuart Cast Stone, Ltd. certifies that its products shall meet or exceed the specified performance characteristics.

Shop Drawings: Shop drawing shall include profiles, cross-sections, reinforcement, exposed faces, arrangement of joints (optional for standard or semi-custom installations), anchoring methods, anchors (if required), annotation of stone types and their location.

1.6. QUALITY ASSURANCE

Manufacturer Qualifications: Christopher Stuart Cast Stone, Ltd. Has plant facilities sufficient to produce the shapes, quantities and size of Cast Stone required in accordance with the project schedule.

Standards: Christopher Stuart Cast Stone, Ltd. finished products comply with the requirements of the Cast Stone Institute® Technical Manual and the project specifications. Where a conflict may occur, the contract documents shall prevail.

PART 2 - PRODUCTS

2.1. ARCHITECTURAL CAST STONE

Comply with ASTM C 1364

Physical properties: Provide the following:

Compressive Strength - ASTM C 1194: 6,500 psi (45 Mpa) minimum for products at 28 days.

Absorption - ASTM C 1195: 6% maximum by the cold water method, or 10% maximum by the boiling method for products at 28 days.

Air Content – ASTM-C 173 or C 231, for wet cast product shall be 4-8% for units exposed to freeze-thaw environments. Air entrainment is not required for VDT products.

Freeze-Thaw – ASTM C 1364: The CPWL shall be less than 5% after 300 cycles of freezing and thawing.

Linear Shrinkage – ASTM E 426: Shrinkage shall not exceed 0.0065%

2.2. RAW MATERIALS

Portland cement: Type I or Type III, white and/or grey, ASTM C 150.

Coarse aggregates: Granite, quartz or limestone, ASTM C 33, except for gradation, and are optional for the VDT casting method.

Fine aggregates: Manufactured or natural sands, ASTM C 33, except for gradation.

Colors: Inorganic iron oxide pigments, ASTM C 979 except that carbon black pigments shall not be used.

Admixtures: Comply with the following:

ASTM C 494/C 495M Types A - G for water reducing, retarding, accelerating and high range admixtures.

Other admixtures: integral water repellents and other chemicals, for which no ASTM Standard exists, shall be previously established as suitable for use in concrete by proven field performance or through laboratory testing.

ASTM C 6.18 mineral admixtures of dark and variable colors shall not be used in surfaces intended to be exposed to view.

ASTM C 989 granulated blast furnace slag may be used to improve physical properties. Tests are required to verify these features.

Linear Shrinkage – ASTM E 426: Shrinkage shall not exceed .065%

Water: Potable
Reinforcing bars:

ASTM A 615/A 615M. Galvanized or epoxy coated.

All anchors, dowels and other anchoring devices and shims shall be standard building stone anchors commercially available in a non-corrosive material such as zinc plated, galvanized steel, brass, or stainless steel Type 302 or 304.

2.3. COLOR AND FINISH

Christopher Stuart Cast Stone, Ltd. shall supply color samples to architect for approval.

All surfaces intended to be exposed to view shall have a fine-grained texture similar to natural stone, with no air voids in excess of 1/32 in. (0.8 mm) and the density of such voids shall be less than 3 occurrences per any 1 in.2 (25 mm2) and not obvious under direct daylight illumination at a 5 ft (1.5m) distance.

Units shall exhibit a texture approximately equal to the approved sample when viewed under direct daylight illumination at a 10 ft (3 m) distance.

ASTM D 2244 permissible variation in color between units of comparable age subjected to similar weathering exposure.

Total color difference – not greater than 6 units.

Total hue difference – not greater than 2 units.

Minor chipping resulting from shipment and delivery shall not be grounds for rejection. Minor chips shall not be obvious under direct daylight illumination from a 20-ft (6 m) distance.

The occurrence of crazing or efflorescence shall not constitute a cause for rejection.

2.4. REINFORCING

Reinforce the units as required by the drawings and for safe handling and structural stress.

Minimum reinforcing shall be 0.25 percent of the cross section area.

Reinforcement shall be non-corrosive where faces exposed to weather are covered with less than 1.5 in. (38 mm) of concrete material. All reinforcement shall have minimum coverage of twice the diameter of the bars.

Panels, soffits and similar stones greater than 24 in. (600 mm) in one direction shall be reinforced in that direction. Units less than 24 in. (600 mm) in both their length and width dimension shall be non-reinforced unless otherwise specified.

Welded wire fabric reinforcing shall not be used in dry cast products.

2.5. CURING

Cure units in a warm curing chamber approximately 100°F (37.8°C) at 95 percent relative humidity for approximately 12 hours, or in a 95 percent moist environment at a minimum 70°F (21.1°C) for 16 hours after casting. Additional curing at 95 percent relative humidity shall be 350 degree-days (i.e. 7 days @ 50°F (10°C) or 5 days @ 70°F (21°C)) prior to shipping.

2.6. MANUFACTURING TOLERANCES

Cross section dimensions shall not deviate by more than $\pm 1/8$ in. (3 mm) from approved dimensions.

Length of units shall not deviate by more than length/ 360 or $\pm 1/8$ in. (3 mm), whichever is greater, not to exceed $\pm 1/4$ in. (6 mm). Maximum length of any unit shall not exceed 15 times the average thickness of such unit unless otherwise agreed by the manufacturer.

Warp, bow or twist of units shall not exceed length/ 360 or $\pm 1/8$ in. (3 mm), whichever is greater.

Location of dowel holes, anchor slots, flashing grooves, false joints and similar features – On formed sides of unit, 1/8 in. (3 mm), on unformed sides of unit, 3/8 in. (9 mm) maximum deviation.

2.7. PRODUCTION QUALITY CONTROL

Testing.

Mix Designs and Products have been tested in accordance with ASTM C 1194 & C 1195. The subsequent results exceeded minimum performance standards.

New and existing mix designs shall be tested for strength and absorption compliance prior to producing units.

2.8. DELIVERY, STORAGE AND HANDLING

Production units shall be identified with marks as shown on the shop drawings.

Product shall be packed to protect them from staining or damage during shipping and storage.

Provide an itemized list of product to support the bill of lading.

3. PART 3 - EXECUTION

3.1. EXAMINATION

Installing contractor shall check Cast Stone materials for fit and finish prior to installation. Do not set unacceptable units.

3.2. SETTING TOLERANCES

Comply with Cast Stone Institute® Technical Manual.

Set stones 1/8 in. (3 mm) or less, within the plane of adjacent units.

Joints, plus - 1/16 in. (1.5 mm), minus - 1/8 in. (3 mm).

3.3. JOINTING

Joint size:

At stone/brick joints 3/8 in. (9.5 mm).

At stone/stone joints in vertical position 1/4 in. (6 mm) (3/8 in. (9.5 mm) optional).

Stone/stone joints exposed on top 3/8 in. (9.5 mm).

Joint materials:

Mortar, Type N, ASTM C 270.

Use a full bed of mortar at all bed joints.

Flush vertical joints full with mortar.

Leave all joints with exposed tops or under relieving angles open for sealant.

Leave head joints in copings and projecting components open for sealant.

Location of joints:

As shown on shop drawings.

At control and expansion joints unless otherwise shown.

3.4. SETTING

Drench units with clean water prior to setting.

Fill dowel holes and anchor slots completely with mortar or non-shrink grout.

Set units in full bed of mortar, unless otherwise detailed.

Rake mortar joints 3/4 in. (18 mm) in. for pointing.

Remove excess mortar from unit faces immediately after setting.

Tuck point unit joints to a slight concave profile.

3.5. JOINT PROTECTION

Comply with requirements of Section 07 90 00.

Prime ends of units, insert properly sized backing rod and install required sealant.

3.6. REPAIR AND CLEANING

Repair chips with touchup materials furnished by Christopher Stuart Cast Stone, Ltd.

Saturate units to be cleaned prior to applying an approved masonry cleaner.

Consult with manufacturer for appropriate cleaners

3.7. INSPECTION AND ACCEPTANCE

Inspect finished installation according to Bulletin #36.

Do not field apply water repellent until repair, cleaning, inspection and acceptance is completed.

END OF SECTION



Architectural Cast Stone Standards

Component	ASTM Specification	ASTM Description and / or Requirement	Christopher Stuart Cast Stone, Ltd. Specifications
Component	ASTM 1364	Standard Specifications for Architectural Cast Stone	Complies
Physical Properties			
Compressive Strength	ASTM C 1194	Standard Test Method for Compressive Strength of Architectural Cast Stone. Minimum of 6,500 psi required.	Exceeded 6,900 psi
Absorption	ASTM C 1195	Standard Test Method for Absorption of Architectural Cast Stone. Maximum absorption allowed is 6%.	2% Absorption
Air Content	ASTM C173 or C231	Standard Test Method for Air Content of Architectural Cast Stone - only applies to wet cast method. 4 - 8% for freeze-thaw environments.	Complies
Freeze - Thaw	ASTM C 1364	Standard Test Method for Freeze - Thaw of Architectural Cast Stone.	Complies
Linear Shrinkage	ASTM C 426	Standard Test Method for Linear Shrinkage for Architectural Cast Stone. Not to exceed .065%.	Complies
Raw Materials			
Portland Cement	ASTM C 150	Type I or Type III white or gray	Complies
Course Aggregates	ASTM C 33	Only applies to wet cast. Granite, Quartz or Limestone (Except for gradation).	Complies
Fine Aggregates	ASTM C 33	Manufactured or Sands (except for gradation)	Complies
Colors	ASTM C 979	Inorganic iron oxide pigments. Carbon black pigments not used.	Complies
Admixtures	ASTM C 260, ASTM 494/C, ASTM C 618 or ASTM C 989	If admixtures are used, the corresponding ASTM standards must be met. If no ASTM standard exists or if no proven field experience for the product has been met, a sampling of the product will be laboratory tested before delivered to job site.	Complies
Water	N/A	Potable	Complies
Reinforcing Bars	ASTM A 615 or ASTM A615M (ASTM A 185 for wire fabric in wet cast units)	Standard Specification for Deformed and Plain Billet-Steel Bars for Reinforced Concrete. Grade 40 or 60 steel galvanized or epoxy coated when cover is less than 1.5 inches. Only applies when required for the application as detailed by shop drawings.	Complies
Anchoring Devices	N/A	When anchoring devices are required, no corrosive materials are to be used.	Complies
Color and Finish			
Air Voids	N/A	No air voids greater than 1/32". Less than 3 voids per 1". Air voids shall not be obvious under direct sunlight at 5 feet distance.	Yes
Matching	N/A	Matching to sample provided by Architect.	Yes
Texture	N/A	Texture shall be approximately equivalent to sample provided by architect when viewed under direct sunlight at 10 feet distance.	Yes
Chipping	N/A	Product packaged securely to prevent chipping during shipment and delivery, however should it occur, minor chipping is not grounds for rejection of product. Any minor chipping during shipment and delivery should not be visible under direct sunlight at 20 feet distance.	Yes
Reinforcing	N/A	Products are reinforced as indicated by the approved drawings for safe handling.	Yes
Curing	N/A	Product must be cured in a heated cure room at 95% relative humidity for a minimum of 16 hours.	Product is cured in a heated cure room at 95% relative humidity for 72 hours.
Manufacturing Tolerances			
Cross Section Dimensions	N/A	Dimensions shall not deviate by more than 1/8" from the approved shop drawings.	Yes
Length	N/A	Length shall not exceed 1/4" from the approved shop drawings.	Yes
Warping	N/A	Warping shall not exceed the length / 360 or 1/8" - whichever is greater.	Yes
Delivery, Storage, Handling	N/A		Finished product will be marked with identification numbers from the shop drawings for ease of identification. Finished product will be placed securely on pallets with foam protection, shrinkwrapped and labeled. Set Plans and Itemized Shipping List will be included with shipment.

GAF Cornell ThermaCal® Nail Base Roof Insulation Panels (RESGN421)

Updated: 2/15



*Quality You Can Trust...From
North America's Largest Roofing Manufacturer!™*

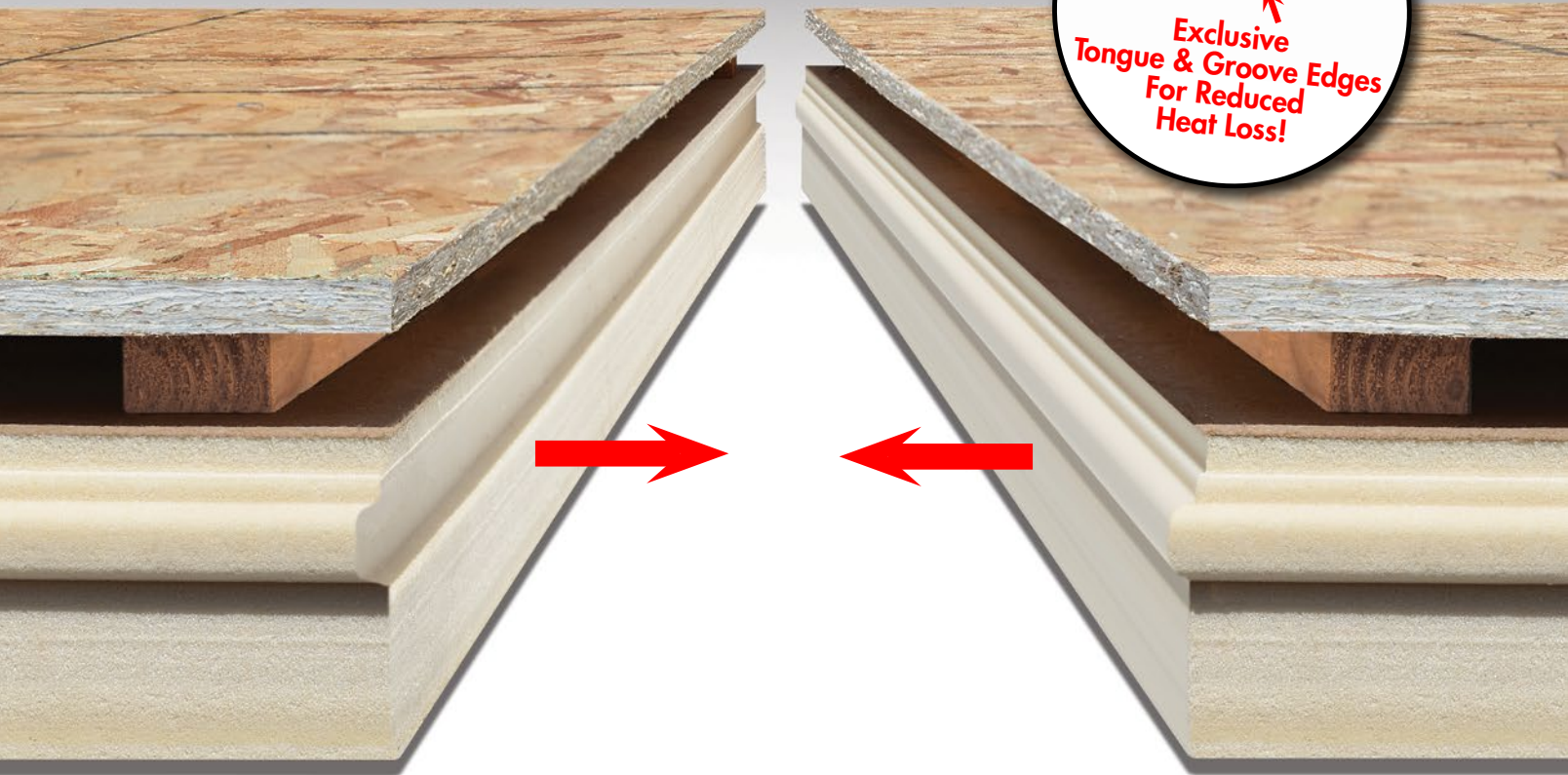


Quality You Can
Trust...From
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Largest Roofing
Manufacturer!™

ThermaCal®

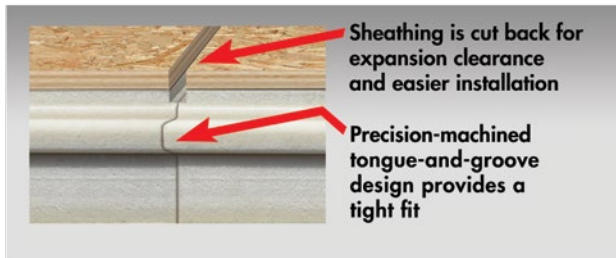
NAIL BASE ROOF INSULATION PANELS

- ✓ Perfect for cathedral ceilings, glue lam, post & beam structures, and conditioned attic spaces
- ✓ Helps reduce heat drive into the living/conditioned spaces
- ✓ Exhausts excess moisture before it can condense in the deck or the roofing system (ventilated versions only)
- ✓ Can be used on structural wood or steel sloped roof decks (Contact GAF for other acceptable roof decks)



Featuring  **EnergyGuard™** Polyiso Insulation

Exclusive Tongue & Groove Design For Maximum Insulating Performance!



Cornell has been making insulated roofing products since 1954! In fact, they were innovators in this product category, starting with their ThermaCal® product. All of GAF Cornell's ventilated insulation panels feature:

- **Reduced Heat Loss...** Exclusive tongue-and-groove design minimizes heat loss up through the panel joints
- **Exceptional Airflow...** Unique spacer pattern maximizes airflow ("upventing") and reduces hot spots
- **Extra-Strong Design...** Unlike some competitive products, our solid wood spacer blocks (positioned 12" [305 mm] or less apart in all directions) minimize the chance of deflection or nail back-out
- **Easy Installation...** Fully machined construction with cut-back sheathing allows for a precision fit
- **Less Hassles...** Unlike most competitive products, H-clips are not required because each panel is pre-spaced to allow for sheathing expansion
- **Sheathing Configurations Available...** 7/16" (11.1 mm) OSB nailing surface (standard); optional 5/8" (15.9 mm) and 3/4" (19.1 mm) OSB or plywood, and FSC Chain-of-Custody-certified plywood and OSB

ThermaCal¹
VENTILATED ROOF INSULATION PANELS

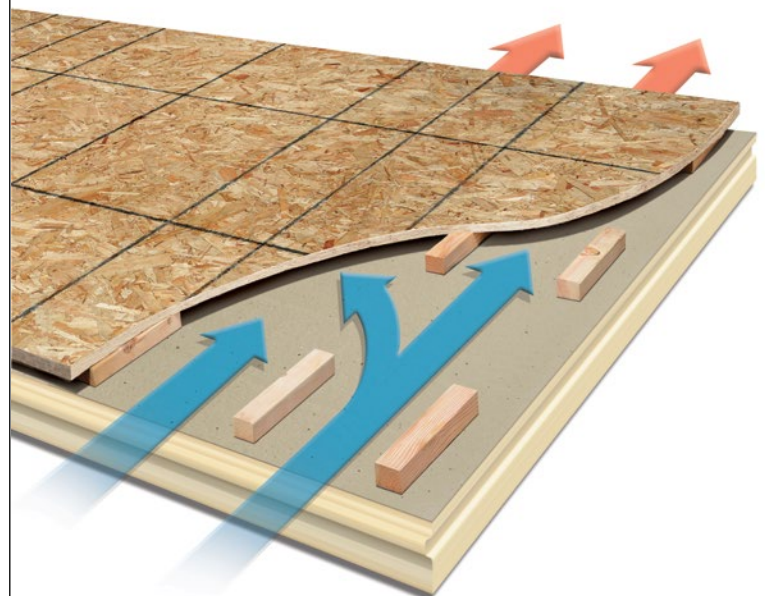
For Shingles and Metal Roofing

- Nominal 4' x 8' (1.21 m x 2.44 m) panel
- Single layer of sheathing (7/16" [11.1 mm] OSB standard)
- R-values from 8.60 to 39.00
- 1" (25.4 mm) airspace standard—10 sq. in. of NFA per ft. (21,163 sq. mm per m) run
- Over 92% open area (spacers occupy only 8% of panel area) with 50% open area for lateral (across the slope) ventilation

ThermaCal® 1 Ventilated Roof Insulation Panels						
Approx. Overall Panel Thickness ¹		Nom. Polyiso Insulation Thickness		Approx. Weight		LTTR R-Value ²
in.	mm	in.	mm	lb/sq. ft.	kg/sq. m	
3.0"	75	1.5"	38	1.9	9.29	8.60
3.5"	89	2.0"	51	2.0	9.76	11.40
4.0"	102	2.5"	64	2.1	10.25	14.40
4.5"	114	3.0"	76	2.2	10.74	17.40
5.0"	127	3.5"	89	2.3	11.23	20.50
5.5"	140	4.0"	102	2.4	11.72	23.60
6.0"	152	4.5"	114	2.5	12.21	26.80
6.5"	165	5.0"	127	2.6	12.69	29.85
7.0"	178	5.5"	140	2.7	13.18	32.90
7.5"	190	6.0"	152	2.8	13.67	35.95
8.0"	203	6.5"	165	2.9	14.16	39.00

¹ Approx. overall panel thickness based on the polyiso insulation, one layer of 7/16" (11.1 mm) OSB, and 1" (25.4 mm) spacer height.

² LTTR R-value refers to polyiso insulation. LTTR R-value calculations are based on ASTM C1289-11A, effective January 1, 2014.



ThermaCal²

VENTILATED ROOF INSULATION PANELS

For Slate, Tile, and Maximum Loading

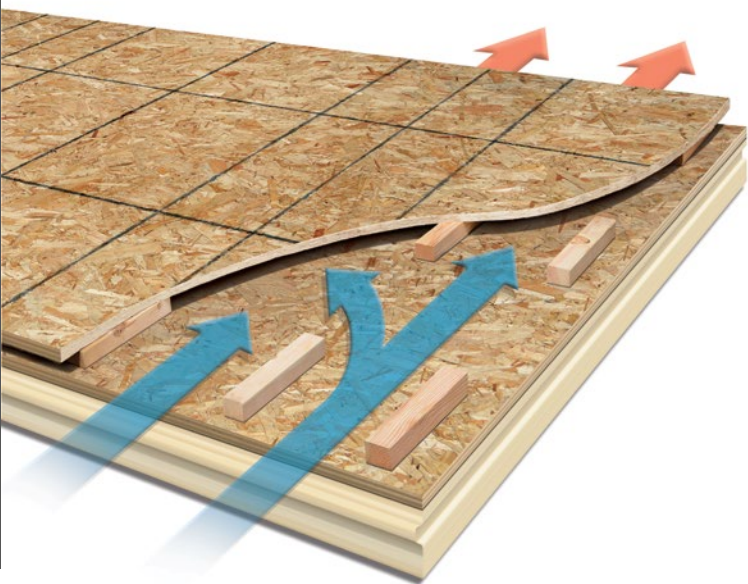
- Nominal 4' x 8' (1.21 m x 2.44 m) panel
- Two layers of sheathing (7/16" [11.1 mm] OSB standard)
- R-values from 9.20 to 36.60
- 1" (25.4 mm) airspace standard—10 sq. in. of NFA per ft. (21,163 sq. mm per m) run
- Over 92% open area (spacers occupy only 8% of panel area) with 50% open area for lateral (across the slope) ventilation

ThermaCal² Ventilated Roof Insulation Panels

Approx. Overall Panel Thickness ¹		Nom. Polyiso Insulation Thickness		Approx. Weight		Total System R-Value ²
in.	mm	in.	mm	lb/sq. ft.	kg/sq. m	
3.5"	89	1.5"	38	3.3	16.11	9.20
4.0"	102	2.0"	51	3.4	16.60	12.00
4.5"	114	2.5"	64	3.5	17.09	15.00
5.0"	127	3.0"	76	3.6	17.58	18.00
5.5"	140	3.5"	89	3.7	18.06	21.10
6.0"	152	4.0"	102	3.8	18.55	24.20
6.5"	165	4.5"	114	3.9	19.04	27.40
7.0"	178	5.0"	127	4.0	19.53	30.50
7.5"	190	5.5"	140	4.1	20.02	33.50
8.0"	203	6.0"	152	4.2	20.50	36.60

¹ Approx. overall panel thickness based on the polyiso insulation, two layers of 7/16" (11.1 mm) OSB, and 1" (25.4 mm) spacer height.

² Total system R-value includes the LTTR R-value of the polyiso insulation and .62 R-value of the 7/16" (11.1 mm) OSB attached to the polyiso. LTTR R-value calculations are based on ASTM C1289-11A, effective January 1, 2014.



ThermaCal[®]

NON-VENTILATED ROOF INSULATION PANELS

For Metal Roofing

- Nominal 4' x 8' (1.21 m x 2.44 m) panel
- Single layer of sheathing (7/16" [11.1 mm] OSB standard)
- R-values from 9.20 to 45.70

All ThermaCal[®] non-ventilated panels feature:

- **Reduced Heat Loss...** Exclusive tongue-and-groove design minimizes heat loss up through the panel joints
- **Easy Installation...** Fully machined construction with cut-back sheathing allows for a precision fit
- **Less Hassles...** Unlike most competitive products, H-clips are not required because each panel is pre-spaced to allow for sheathing expansion
- **Sheathing Configurations Available...** 7/16" (11.1 mm) OSB nailing surface (standard); optional 5/8" (15.9 mm) and 3/4" (19.1 mm) OSB or plywood, and FSC Chain-of-Custody-certified plywood and OSB

ThermaCal[®] Non-Ventilated Roof Insulation Panels

Approx. Overall Panel Thickness ¹		Nom. Polyiso Insulation Thickness		Approx. Weight		Total System R-Value ²
in.	mm	in.	mm	lb/sq. ft.	kg/sq. m	
2.0"	51	1.5"	38	1.7	8.30	9.20
2.5"	64	2.0"	51	1.8	8.79	12.00
3.0"	76	2.5"	64	1.9	9.29	15.00
3.5"	89	3.0"	76	2.0	9.76	18.00
4.0"	102	3.5"	89	2.1	10.25	21.10
4.5"	114	4.0"	102	2.2	10.74	24.20
5.0"	127	4.5"	114	2.3	11.23	27.40
5.5"	140	5.0"	127	2.4	11.72	30.50
6.0"	152	5.5"	140	2.5	12.21	33.50
6.5"	165	6.0"	152	2.6	12.69	36.60
7.0"	178	6.5"	165	2.7	13.18	39.60
7.5"	191	7.0"	178	2.8	13.67	42.65
8.0"	203	7.5"	191	2.9	14.16	45.70

¹ Approx. overall panel thickness based on the polyiso insulation and one layer of 7/16" (11.1 mm) OSB.

² Total system R-value includes the LTTR R-value of the polyiso insulation and .62 R-value of the 7/16" (11.1 mm) OSB attached to the polyiso. LTTR R-value calculations are based on ASTM C1289-11A, effective January 1, 2014.



Short Form Draft Specifications

(THERMACAL® 1 VENTILATED ROOF INSULATION PANELS ONLY)

Note to Specification Writer: This draft spec can be used for ThermaCal® 1 (with one layer oriented strand board). This spec is typically placed in Section 07220. All product specifications can be downloaded from our website at gaf.com, or from www.cornellcorporation.com.

1. VENTILATED ROOF INSULATION

A. Description of system:

1. The ventilated roof insulation should be a factory-assembled panel consisting of one layer of $\frac{7}{16}$ " (11.1 mm) oriented strand board top surface, a built-in ventilation space maintained by 1" (25.4 mm) wood spacer blocks, and polyisocyanurate insulation on the bottom.
2. The Long Term Thermal Resistance (LTTR) R-Value of the polyiso insulation shall be no less than _____.
3. Wood panel edges shall be rabbeted to allow the foam edges to fit together, while providing clearance between the wood sheathing on adjoining panels.
4. Foam sides and ends shall have a machined tongue-and-groove profile to reduce heat loss at the joints.
5. The wood spacer blocks shall not exceed 8% of the panel area and shall have 50% open area for lateral (across the slope) ventilation. Spacer blocks shall not be over 12" (305 mm) apart in either direction.
6. The vent space shall provide a minimum of 10 sq. in. of Net Free Area per lineal foot (21,163 sq. mm per lm) on insulation (along the 8' [2.44 m] edge) after deduction for the spacer blocks.
7. The ventilated roof insulation will be attached with GAF Cornell Fasteners per specified wind load requirements.

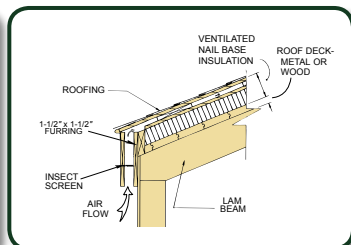
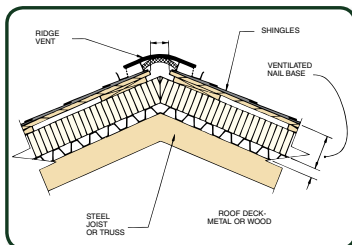
2. SUBMITTALS

- A. The following will be submitted to the architect for approval: copies of the manufacturer's product information and installation instructions; a sample with the edge profile specified and large enough to show the actual lateral spacing of the vent space supports; a manufacturer's dimensioned drawing showing how the 50% lateral ventilation is achieved; and calculations of spacer block percentage of panel area and the Net Free Area per lin. ft. (lm) of insulation after deducting for spacers.

3. PRODUCTS

- A. Products shown below are acceptable provided they meet the requirements of this specification.
1. ThermaCal® 1 Ventilated Roof Insulation Panels from GAF Cornell, 1 Campus Drive, Parsippany, NJ 07054, 1-800-ROOF-411 or 1-800-522-9224, gaf.com or www.cornellcorporation.com.
2. **NOTE:** The designer should determine if a vapor barrier is required between the deck and the insulation. The vapor retarder should always be specified in buildings with high humidity. Always refer to local building codes.

Fastener Requirements: GAF Cornell requires the use of its fasteners for steel and wood substrate applications for all nail base roof insulation panels. See complete installation instructions, available from GAF Cornell, for recommended fastening patterns.



Standards

(ALL PANELS EXCEPT AS NOTED)

- Polyiso insulation complies with ASTM C1289, Type II, Class I, Grade 2
- Standard APA/TECO rated OSB or optional plywood
- Optional FSC Chain-of-Custody available upon request Certificate #SGS-COC-005443

ANSI/UL 790 Classification

Classified under ANSI/UL 790 as a Shingle Decking Accessory for use with Class A, B, or C shingles, metal, tile, or slate roof coverings

ANSI/UL 1256 Classification

Classified for Insulated Metal Deck Assemblies, Constructions No. 120 and No. 123

Physical Properties

- Sheathing – OSB conforms to APA Standard PRP 109, Exposure 1, and HUD/FHA-918
- Polyiso insulation:
 - ASTM E84 Flame Spread Index of 45-50
 - ASTM E84 Smoke Developed Index of 105-450
 - Moisture Vapor Permeance per ASTM E96 of less than 1.5 perms

Vent Space Properties (ThermaCal® 1 and 2 only)

- Depth: 1" (25.4 mm) standard
- Cross Section: 10 sq. in. of Net Free Area per lin. ft. (21,163 sq. mm per lm) (along the 8' [2.44 m] edge dimension after deducting spacer block area)
- Open Area: Not less than 92% of panel area
- Spacer Separation: 12" (305 mm) or less apart in all directions

NOTE: Always refer to local building codes.

FASTENERS

GAF Cornell offers a full-line of nail base roof insulation panel fasteners for wood and steel roof deck applications. These fasteners meet FM wind load requirements. Contact GAF for more information.



For Technical Assistance:
1-800-ROOF-411

For Assistance With Specifications, Contact
GAF Architectural Information Services at:
1-800-522-9224 or ais@gaf.com



ELIGIBLE FOR
LEED® CREDITS



gaf.com or www.cornellcorporation.com

SECTION 3133: Concrete Patching

100 DESCRIPTION

1. This specification describes installation of concrete patching compounds.

101 GENERAL

1. Wherever the words "approved by", "equivalent" or similar phrases are used in this specification, they shall be understood to mean that the material, process or item referred to shall require the written approval of the patching system manufacturer.

2. This specification shall be read in conjunction with project specifications, sketches, photographs and/or drawings indicating the precise extent of work and the use and location of specific materials.

3. Contractor shall make a pre-bid field visit to verify all work shown or not shown on the drawings.

103 WORK INCLUDED

1. Provide all labor, equipment and materials necessary to complete the following concrete repair work:

- a. Preparation of all surfaces to receive patching compound.
- b. Mixing and transportation of patching compound.
- c. Repairs to delaminated and scaled areas of existing concrete.
- d. Priming of repair areas and placement of patching compound.
- e. Finishing and curing of patches.
- f. Repair of cracks.

2. Related work, described elsewhere:

102 QUALITY ASSURANCE

1. Restoration Specialist: Work must be performed by a firm having not less than 5 years successful experience in comparable concrete repair projects, and employing personnel skilled in the restoration process and operations indicated.

a. Only skilled journeyman masons and/or cement finishers who are familiar and experienced with the materials and methods specified and are familiar with the design requirements shall be used for concrete restoration.

b. One skilled journeyman mason or cement finisher, trained and certified by the concrete repair system manufacturer shall be present at all times during concrete restoration and shall personally direct the work.

2. Field Construction Mock-Ups: Prior to start of general concrete restoration, prepare the following sample panels and sample areas on building where directed by Architect or Owner's Representative. Obtain Architect or Owner's Representative approval of sample before proceeding with the work. Retain accepted panels/sample areas in undisturbed condition, suitably marked, during restoration as a standard for judging completed work.

a. Cleaning: Demonstrate materials and methods to be used for cleaning for each type of concrete surface and condition on sample panels each approximately 25 sq. ft. in area. Test adjacent non-masonry materials for possible reaction with cleaning materials. Allow waiting period of duration indicated, but not less than 7 calendar days after completion of sample panels for negative reactions.

b. Paint, Graffiti, and Metallic stain removal: Demonstrate materials and methods to be used for paint, graffiti, and stain removal for each type of surface and condition on sample panel 4 sq. ft. in area. The removal method or methods shall be tested on an inconspicuous area of the building.

c. Crack Repair: Prepare a sample area for each type of crack repair required for stone (i.e. hairline cracks and microscopic cracks 1/64"-1/16" in size; cracks and voids larger than 1/8"). Repair shall demonstrate methods and quality of workmanship expected for crack repair.

d. Patching: Prepare on-building sample of each type of construction to be patched, rebuilt and/or replaced (e.g. one balcony surface, one deck area, one cornice unit, one window sill; one wall area). Patching shall demonstrate methods and quality of workmanship expected of repair work.

e. The samples of each type of repair work shall be done in an area that will be exposed to the same weathering conditions as the building. Allow samples to cure at least three days before obtaining acceptance of color, texture and detailing match. Samples shall be viewed from an approved distance.

3. Source of Materials: Obtain materials for Patching, coating, sealing and crack repair from a single source manufacturer to ensure match quality, color, texture and detailing.

103 SUBMITTALS

1. Product Data: Submit manufacturer's technical data for each product indicated including recommendations for their application and use. Include test reports and certifications substantiating that products comply with requirements.

2. Submit the following items in time to prevent delay of the work and to allow adequate time for review and resubmittals, if needed. Do not order materials or start work before receiving the written approval.

a. Written certificates from the patching materials manufacturer should be submitted stating that all installers of the patching material have successfully completed a training workshop for installation of the patching material, or have met alternative workmanship qualifications acceptable to the manufacturer.

b. Material Safety Data Sheets (MSDS) for all specified materials.

c. Certificates, except where the material is labeled with such certification, by the producers, of the materials, that all materials supplied comply with all the requirements of these specifications and the appropriate standards.

d. Written verification that all specified items will be used. Provide purchase orders, shipping tickets, receipts, etc. to prove that the specified materials were ordered and received.

3. Restoration Program: Submit written program for each phase of restoration process including protection of surrounding material on building and site during operations. Describe in detail material, methods and equipment to be used for each phase of restoration work.

a. If alternative methods and materials to those indicated are proposed for any phase of restoration work, provide written description, including evidence of successful use on other, comparable projects, and program of testing to demonstrate effectiveness for use on this project.

104 DELIVERY, STORAGE AND HANDLING:

1. Deliver materials to site in manufacturer's original unopened containers and packaging, bearing labels as to type and names of products and manufacturers.

2. Deliver and store restoration material in manufacturer's original, unopened containers with the grade, batch and production data shown on the container or packaging.

3. Protect restoration materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.

4. Protect materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

5. Comply with the manufacturer's written specifications and recommendations for mixing, application, and curing of grouts and patching materials.

105 PROTECTION / SITE CONDITIONS

1. Protect persons, vehicles, building site and surrounding buildings from injury resulting from concrete restoration work.

2. Clean concrete surfaces only when air temperatures are above 40 degrees F (4 deg. C) and will remain so until concrete has dried out.

3. Do not perform any patching unless air temperatures are between 40 degrees Fahrenheit (10 deg. C) and 86 degrees Fahrenheit (30 deg. C) and will remain so for at least 48 hours after completion of work.

4. Do not perform any patching work if precipitation is expected. In case of unexpected precipitation, work shall cease and all uncured material shall be adequately protected with an impermeable polyethylene sheet.

5. If either the ambient or subsurface temperature is expected to fall between 35F (2C) and 40F (4C) during curing and ultimate drying of the patching compound, then the cold weather precautions outlined in item 7, below, of this section of the specification shall be followed.

6. If ambient or surface temperature is expected to rise above 86F (30C) during application and curing of the patching compound, then the hot weather precautions outlined in item 8 of this section of the specifications shall be followed

7. Cold Weather Precautions:

a. SYSTEM 44-FS grades shall be substituted for SYSTEM 44 Regular grades. Do not mix or place different grades together.

b. Curing times shall be extended to compensate for lower temperature cure.

c. Do not proceed if temperatures will drop below freezing before patching compound has reached final set. Any material disrupted by early freezing must be removed and replaced under appropriate controls or conditions.

d. If auxiliary heating will be used to protect freshly placed materials from freezing, equipment must not directly vent exhaust gases onto the repair materials or into repair enclosure air. This may cause carbonation and low strength. Use moderate temperatures and heated air or radiant heat.

8. Hot Weather Precautions:

a. SYSTEM 44 Regular grades shall be substituted for FS grades. Do not mix or place different grades together.

- b. All materials shall be kept cool, stored out of direct sun.
 - c. Pre-cooling of subsurface shall be carried out by continuous wetting at least one hour before placing patching compounds. This shall be done by covering or draping the entire repair area with burlap and by continuously keeping the burlap wet. The burlap shall be removed just prior to the patching of each area, as work proceeds.
 - d. In hot, dry, windy weather, repair areas shall be covered or draped with burlap for a minimum of 3 hours after patch placement, to avoid rapid drying of the patches. Maximum wet cure time shall not exceed 24 hours.
9. Prevent masonry patching materials from staining the face of other surfaces to be left exposed. Immediately remove all patching materials that come in contact with such surfaces.
10. Cover partially completed work when work is not in progress.
11. Protect sills, ledges and projections from droppings.

106 SEQUENCING / SCHEDULING:

1. Perform concrete restoration work in the following sequence:
- a. Remove paint, stains and plant material from all surfaces.
 - b. Remove existing unsound materials from areas indicated to be restored.
 - c. Pressure wash building and repair surfaces as indicated.
 - d. Patch and repair existing concrete structures as indicated.
 - e. (Optional): Provide consolidation/water repellent treatment for concrete structures as indicated. Water repellents/consolidants are specified in Section 07180.
 - f. (Optional): Provide special coating over indicated sections as specified in Section 09800.

200 MATERIALS

1. This specification describes the materials used in, and in conjunction with concrete patching.

201 PRODUCTS

1. Patching compound shall be a prepackaged, 1-component, acrylic polymer modified blend of portland cement, specially graded aggregates and admixtures, designed for low

shrinkage, low stress cure, and compatibility with existing host concrete. Prior to patching, sample cores of existing concrete shall be delivered by Contractor to manufacturer for testing and evaluation. Patching compound shall be customized by manufacturer, so that compressive strength does not exceed 4000 psi, or 500 psi above the existing concrete's compressive strength, whichever is lower, as measured by ASTM C-109.

a. Patching compound shall develop a minimum 200 psi direct tensile adhesion with host substrate, when applied in accordance with these specifications.

b. Tensile strength of patching compound shall be a minimum of 400 psi. Flexural modulus shall be 1.1×10^6 psi. Material must be vapor permeable, with a minimum permance of 8 perms at 1/2" depth as measured by ASTM E-96.

c. Water used for cleaning, mixing and finishing shall be clean, potable, free from oil, acid, injurious amounts of vegetable matter, alkalies or other salts.

d. No colorants, accelerators, bonding agents or other additives shall be added to the patching compound without express written direction of the manufacturer.

e. Acceptable products: SYSTEM 44-Regular for horizontal surfaces, and System 44-V/O for vertical and overhead surfaces, as manufactured by Edison Coatings, Inc., (800) 697-8055, or approved equal.

2. Crack sealant for small cracks shall be a 100% solids, 2-component elastomeric epoxy with 110% elongation and minimum 1200 psi tensile strength as measured by ASTM D412.

a. Acceptable products: Flexi-Seal 510 as manufactured by Edison Coatings, Inc. (800) 697-8055, or approved equal.

3. Primer and reinforcing steel primer/corrosion inhibitor shall be an alkaline, silica fume modified, latex modified cementitious coating.

a. Acceptable products: SYSTEM 49 CPBA, as manufactured by Edison Coatings, Inc., (800) 697-8055, or approved equal.

4. The products specified herein shall be assumed to meet the performance criteria specified. If a proposed equal is submitted, thorough lab testing shall be required to establish equivalent performance levels. An independent testing laboratory shall be utilized as determined by the Architect, and shall be paid for by the submitting party.

300 EXECUTION: SURFACE PREPARATION & DETAILING

1. This section describes the preparation required for various surfaces which are to receive patching compound.

301 SURFACE PREPARATION

1. Prior to patching, all surfaces must be prepared in accordance with this section of the specifications.

2. Remove all unsound concrete, using lightweight demolition hammers, not to exceed 18 pounds in weight. All removals to be performed in accordance with ICRI Guideline #03730, which shall be a part of these specifications, with regard to removal geometry, exposing, undercutting and cleaning of embedded reinforcement, and conditioning of edges and surfaces. Following demolition, test surfaces for alkalinity/carbonation with a 1% solution of phenolphthaleine. Surfaces which do not indicate alkalinity (solution turns pink) shall require further demolition.

3. Pressure wash all indicated surfaces using 3000-4000 psi water, as required to remove all dust and dirt. Abrasive shall be used in combination with water when cleaning repair cavities, as required to eliminate micro-cracked surface materials resulting from demolition. No water with concrete dust shall be allowed to remain on any surface following washing, and must be immediately removed, prior to drying and re-hardening.

4. The result of this preparation shall render a surface clean, meaning having complete exposure of sound original material without any deposits of contaminants, foreign matter or loose material, which could affect the bond or long-term durability of the surface and the patching compound.

302 CRACK REPAIR

1. Patching compounds are not to be used to bridge working cracks or joints.

2. Crack repair for small cracks less than 1/16" (62 mils, 1.5 mm) shall be performed following pressure washing and drying by gravity filling with elastomeric crack sealant. Cracks wider than 1/16" shall be grooved out to a nominal 1/2" x 1/2" (3mm x 3mm), and filled with crack sealant.

3. Expansion joints are not included under this section of the specification.

303 PRIMING OF REINFORCING STEEL

1. Any steel reinforcement exposed in the course of removing unsound materials shall be cleaned and prepared in accordance with the above specifications. The result of this cleaning shall be a steel surface free from visible rust or scale.

2. Following cleaning and prior to patching, apply cementitious corrosion inhibitive primer and bonding agent to all steel surfaces in accordance with manufacturer's instructions. Care must be taken to create a continuous coating on the full surface, including the underside of the undercut reinforcement. Observe manufacturer's guidelines with regard to minimum and maximum timing "windows" for patching after application of primer.

400 CONCRETE PATCHING

1. Following preparation, as specified above, contractor shall maintain work area in a clean condition, including materials, equipment and workers' footwear, to avoid tracking in of contaminants, dirt, dust, mud or other materials which may interfere with adhesion and durability of repairs.

2. Prior to patching, all repair areas to be patched shall be kept continuously wet for at least 20 minutes prior to application of patching compound. Before placing patch, excess water shall be blown, vacuumed or otherwise removed from the surface, leaving the surface damp or saturated/surface dry.

3. Vigorously brush-apply a slurry coat of cementitious primer / bonding agent with into all cavity surfaces.

4. Immediately after primer application, and while primer is still wet, mix and place patching compound in accordance with manufacturer's instructions.

5. Mix the measured quantity of water specified by the manufacturer with full bags of patching compound only. Mix using slow speed drill (450 rpm maximum) with mud or paddle mixer. Motorized mortar mixers may be used for mixing larger quantities. Mix for precisely 4 minutes, using a mix timer. Mix to a uniform consistency, free of lumps or dry material. Do not whip air into the mix. Do not over-mix.

6. When placing the patching compound, care shall be taken to assure that all corners and gaps under reinforcing steel and entire cavity profile is completely filled and properly compacted to prevent formation of voids or unbonded areas. Work the material into corners and gaps, and onto cavity sidewalls using pressure on the trowel to assure good contact between patch and substrates.

7. Patches deeper than 1½" (25 mm) may be extended by coarse aggregate addition. 20 pounds of clean, washed, 3/8" pea stone suitable in composition and surface profile for use as a concrete aggregate, may be added to each 50 pound bag of patching compound.

8. Do not retemper material which has begun to set. Discard any unused material after 30 minutes. Do not excessively wet patch surfaces after placement or as an aid to trowelling. Limit surface water addition to light misting and do not wet or rework repeatedly.

9. Observe the curing requirements for each day's working conditions, as specified herein. Do not extend wet curing beyond the maximum specified. Do not open to traffic or expose to weather until adequate strength has been reached, as affected by working and curing conditions.

SYSTEM 44-SERIES

LATEX-MODIFIED STRUCTURAL CONCRETE REPAIR MORTARS

DESCRIPTION:

Edison **SYSTEM 44-Series** patching compounds are one-component, polymer-modified cement-based mortars designed for effective and economical repairs to all types of concrete structures. When mixed with water, the polymer redisperses to provide a high performance latex-modified repair mortar.

The series includes a wide range of formulations, each engineered for maximum performance and workability under a particular set of service and application conditions.

RECOMMENDED USES:

- ☒ Deck Patching
- ☒ Vertical Surface Repairs
- ☒ Negative Angle (Overhead) Repairs
- ☒ Trowel Applications
- ☒ Pour or Pump Applications
- ☒ Repairs to Beams and Columns
- ☒ Walkway Repairs
- ☒ Piers and Dams
- ☒ Water Tanks and Pools
- ☒ Industrial Floor Repairs
- ☒ Parking Decks and Ramps

SYSTEM ADVANTAGES:

System 44-Series pre-packaged repair mortars offer consistent proportioning and reliable performance at moderate cost. Formulations take maximum advantage of the most advanced available performance-enhancing

cement admixtures in the industry. The result is a series of user-friendly repair compounds offering exceptional workability, durability and productivity.

SYSTEM SELECTION:

1. SET SPEED: Start with an assessment of the desired setting time. Will repair areas have to be back in service minutes after application, or would longer working time be advantageous? With three standard set speeds to choose from, there is an optimum **44-Series** system for each situation:

SYSTEM 44: "Regular" setting material offers the right combination of working time and strength development for most applications. Allows time for fine finishing, and facilitates work in hot weather, when other products may set too quickly.

SYSTEM 44-FS: "Fast Setting" formulas reduce downtime and permit work at lower temperatures.

2. GRADE: Once set speed has been selected, the next decision revolves around where the product will be used and how it will be applied. Select the grade of **SYSTEM 44 or SYSTEM 44-FS** which closely meets the requirements of your repair situation.

Standard (Horizontal Surface) Grade: Repair mortars for horizontal surfaces provide good leveling without compromising strength. At the same time, mixes should not tend to separate or settle, allowing the use of mechanical pumping equipment for large-scale applications.

Vertical/Overhead ("V/O") Grade: Mortars for use on vertical and overhead repair areas can be built up without sagging or dropping out of the repair cavity.

3. OPTIONS: In addition to the standard formulations based on speed and application, the **44-Series** also includes several options which allow you to further tailor the repair material to the requirements of the situation.

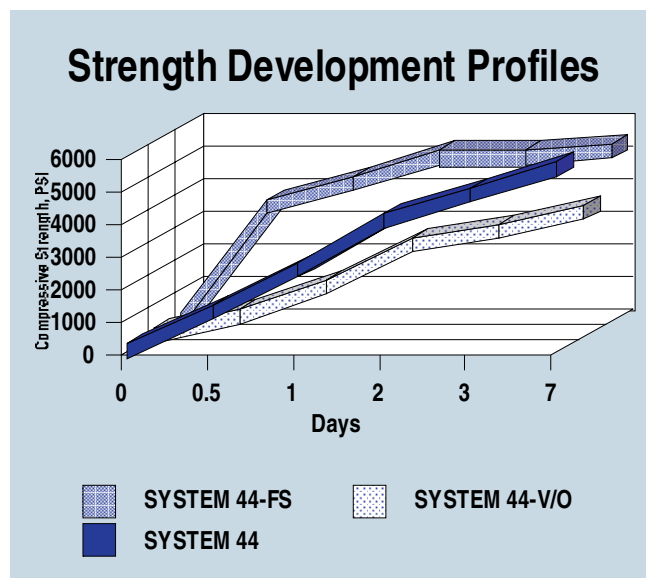
A. NON-POLYMER ("NP"): While all *44-Series* standard formulations are polymer-modified using the highest quality admixtures, some situations - such as continuous underwater exposures and applications to "can't dry" surfaces - are better addressed by unmodified mixes or by mixes modified with a marine grade latex modifier such as *Restoration Latex RL-3*. Still others may have a preference for liquid modifiers, such as *Restoration Latex RL-1* acrylic modifier, which facilitates efficient hand-mixing of small mortar batches, and provides superior control of appearance with mortars that will be pigmented. Liquid admixtures can also be used with non-polymer grades of *44-Series* mortars where locally available water is of poor quality, to eliminate any need for mixing water. If no polymer will be used, provisions for wet curing should be anticipated, and alternative adhesion-promoting techniques - such as proper slurry coating - should be employed.

Restoration Latex	Description
RL-1	General Purpose
RL-2	Superplasticized, Pourable
RL-3	Marine/Immersion
RL-4	High Permeability
RL-5	Hot Weather
RL-6	Cold Weather

B. FIBER REINFORCED ("FR"): Fiber addition to concrete and mortar has become a well-accepted alternative to secondary reinforcement. Fibers also reduce shrinkage and plastic cracking, increase tensile strength and may aid in dispersing impact and vibrational forces. The short (approx. 1/2") fibers available in *44-Series* products are alkali-resistant polymers which will not corrode or change in volume. The level of addition and length of fibers used have been selected to provide the optimum enhancement without compromising workability.

C. SILICA FUME ("SF"): The addition of microsilica to Portland cement mixes is credited with

providing reduced permeability to moisture and salt, and consequently, improved corrosion protection for steel reinforcement. Microsilica is offered on *SYSTEM 44* (Normal Set Speed)



products, which have been balanced to accommodate the effects of microsilica on water demand and workability.

PRODUCT CHARACTERISTICS:

Composition: Products are polymer-modified cement-based mortars, free of chlorides, metallic additives, water repellents and other potentially deleterious admixtures. Silica aggregates used in *SYSTEM 44-Series* products have been washed and screened to remove nearly all toxic crystalline silica.

Adhesion: Products develop high direct tensile bond strength (>125 psi) and adhere to concrete, masonry, steel, wood and polystyrene foam. *SYSTEM 44* is not recommended on wood.

Weathering: *44-Series* products are UV-Stable, non-yellowing, resistant to wet/dry and freeze/thaw exposures and are intended for both outdoor and indoor use.

Minimum Use Temperatures:

SYSTEM 44	45°F	(6°C)
SYSTEM 44-FS	40°F	(4°C)

TYPICAL SET TIMES (72°F)	
Product	Initial Set Time (Minutes)
SYSTEM 44	60 - 70
SYSTEM 44-FS	45 - 60
SYSTEM 44-V/O	60 - 90
TYPICAL PROPERTIES <i>System 44, 28-Day Cure, 72°F</i>	
Compressive Strength	4500 psi
Modulus of Elasticity	1.1 x 10⁶
Tensile Strength	>500 psi
Direct Tensile Bond	>125 psi
Drying Shrinkage	Low (<0.05%)

APPLICATION:

1. Surface Preparation

Proper surface preparation is essential to the success of any concrete repair program. The extent to which existing materials must be removed and replaced will be influenced by a variety of existing conditions and anticipated exposure considerations. Except for minor repairs, structural restoration is best performed under the direction of a qualified professional. As a reference resource, we recommend the ICRI publication #03730, "Surface Preparation Guidelines for the Repair of Deteriorated Concrete Resulting From Reinforcing Steel Oxidation".

As a general guide, surface preparation must result in the removal of all unsound concrete, and any coatings, oil, dirt, paint, curing compounds, corrosive chemicals or any other material which may hinder adhesion or performance of repair mortars. A clean, hard, rough surface should be provided. Shape and depth of the repair should also be considered. Although **44-Series** repair compounds are designed to adhere and gain strength even in thin sections, many types of structural repairs are better accomplished when edges are saw cut. Following removal of concrete from the repair area, abrasive blasting or high pressure water blasting should be used to remove dust, concrete slurry or loose

aggregates. Vacuuming does not effectively remove fine dust from surface pores.

2. Priming

Patching compounds should not be applied to dry surfaces. As a minimum measure, surfaces should be dampened with clean water for at least 20 minutes before patching. Any excess standing water should be removed before repair compound is placed. Priming with a slurry of **SYSTEM 44-Series** mortar mixed with latex bonding agent such as **SYSTEM 42** is preferable to water dampening. Slurry coat should not be allowed to set for more than 4 hours before patch application. An alternative for priming is the use of **FLEXI-BOND 540** epoxy bonding agent. This material can be used to protect steel reinforcement, consolidate porous substrates and create a waterproof barrier between the slab and repair mortar while providing exceptional adhesion. Patching compound may be placed any time before **FLEXI-BOND 540** cures to a tack-free film.

3. Application

While application procedures can vary as widely as the concrete repair situations being addressed, certain basic guidelines are important to follow in the use of **44-Series** repair mortars:

a. **Keep water addition levels low.** Generally, the lower the water-cement ratio, the lower the permeability and the higher the strength of the completed repair. Use the minimum amount of water which will produce a workable, plastic consistency. **Horizontal** grades **44** and **44-FS** should use less than 2/3 gallon water per 50-pound bag. **Vertical** grades are designed for higher water use levels, typically at about 3/4 gallon per 50 lb. bag. **V/O** grade should be mixed to a damp crumbly consistency which compacts when pressed and "slicks out" when troweled.

b. **Do not retemper or overwork.** Maximum workability is obtained shortly after mixing. Do not add more water once material starts to set. Finish surfaces as quickly as possible after placement. Dampening of tools or light misting of plastic mortar surfaces is recommended to aid in finishing, when moderation is exercised. Slight surface dampening is also preferable to making "wetter" mixes.

c. **Avoid rapid drying, but DRY cure.** Polymer modified cement mixes require a minimum period of

moisture in order to gain strength. When working under hot, dry or windy conditions, surfaces may require misting or plastic film protection to avoid too-rapid drying. This is particularly important when large or deep patches are exposed to direct sun. A minimum of 2 hours before drying is required for thin repairs, while sections over 1" deep will benefit from up to 24 hours moist curing. Beyond this relatively short moist curing period, it is essential that the repair compound be allowed to dry out. Continuous moist cure will prevent the latex admixture from forming a proper film, resulting in reduced mechanical strengths and adhesion. After initial set, however, intermittent wet exposures, such as periods of rain or occasional spillage, do not compromise properties. Patches which will be submerged should utilize **NP Non-Polymer** grade, mixed with **Restoration Latex RL-3**, Marine/Immersion grade polymer admixture. Dry cure for a minimum of 5 - 7 days before submersion.

CAUTION!: Dry-curing guidelines do **not** apply to **non-polymer 44-Series** products, which will benefit from extended **wet** curing. **SYSTEM 44-NP** should be wet cured for up to 7 days. **SYSTEM 44-FS-NP** reaches full cure in 24 - 48 hours. **SYSTEM 44-FS+ NP** can be wet cured for 12 - 24 hours.

d. Temperature and humidity affect set times and curing. Be aware of weather changes and their effects on pot life, drying time and strength development. Particular attention must be given when working at low temperatures or when rain is threatening. If materials are not allowed sufficient cure time to reach strengths at which they can withstand rain or freezing, damage may result. Polymer-modified patches must be through-dry before freezing.

Observe all safety and handling guidelines as detailed in the Material Safety Data Sheets supplied with this product.

Keep dry and off the floor or ground. Store at 45 to 85°F for longest shelf life. Do not expose bags to rain or high humidity.

Avoid skin and eye contact. Cement can cause burns and injury. Wash exposed skin immediately with mild soap and water. In case of eye contact, flush with clean water for at least 15 minutes and consult physician.

Avoid breathing dust. Sand may contain residual free silica which may cause occupational lung disease. Wear NIOSH-approved dust filters rated for silica exposure when handling dry materials. Products may contain Portland cement and lime. Avoid skin and eye exposure as burns may result.

FOR COMMERCIAL AND INDUSTRIAL USE

Rev. 11/2006

3. STORAGE & HANDLING:



3 Northwest Drive, Plainville, CT 06062

Phone: (860) 747-2220 or (800) 697-8055

E-mail: edison@edisoncoatings.com

Fax: (860) 747-2280 or (800) 697-8044

Internet: www.edisoncoatings.com

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LEVEL-X52, 52-XT

SELF-LEVELING, SELF-SMOOTHING CEMENT-BASED TOPPINGS

DESCRIPTION:

LEVEL-X52 and **52-XT** are one-part, cement-based, polymer-modified floor topping and leveling compounds designed to provide smooth and level floors with a minimum of time and labor.

LEVEL-X52 can be used to prepare a wide variety of sub-floors for installation of tile, carpet, resilient flooring, wood flooring and many types of surface coatings. It may also be left exposed as a final finish in light industrial or commercial environments.

LEVEL-X52-XT provides rapid-curing, economical repair, leveling and casting in exterior exposures and in wet environments. It readily accepts a variety of finishes, or may be left exposed to traffic and weather.

USES:

- ✓ Leveling uneven concrete
- ✓ Resurfacing frozen, rained-on or scaled concrete
- ✓ Correcting camber problems
- ✓ Filling depressions, sags or “birdbaths”
- ✓ Topping and leveling pre-cast planks or tees
- ✓ Smoothing rough concrete

FEATURES:

Bonding: Polymer modified formula develops high adhesive strength on properly prepared sub-flooring.



Ease of Application:

Requires no special skills, tools or additives. **LEVEL-X52 & 52-XT** are simply mixed with water using a drill or other mechanical mixer, poured, spread and left to harden. May be installed in any thickness in one lift. Readily pumpable using any standard grout pump for large installations, without separation, settling in lines or “bleeding”.

Compatibility: May be used over concrete, wood, steel or polystyrene foam. Readily accepts many types of coatings, adhesives and mastics typically used in setting tile and installing carpeting or other types of flooring.

Non-Dusting and Water Resistant: Does not tend to “dust” through carpeting or crumble upon contact with moisture, the way gypsum based self-leveling compositions tend to do. Keeps from soiling carpets, lifting tiles and blistering coatings and coverings.

High Strength: Cement-based composition builds strength up to 5800 psi, matching high quality concrete.

Safety: Contains no toxic resins, solvents or diluents. Odorless, non-flammable, non-corrosive.

APPLICATION:

1. Surface Preparation: Remove all grease, oil, dirt, laitance, wax, curing compounds, unsound concrete or other materials which may interfere with adhesion. Frozen or other substandard concrete surfaces must be cut back to the depth required to reach sound substrate for bonding.

2. Priming: Non-porous floors may require the use of **SYSTEM 42** as an adhesion promoting primer. Highly porous floors may require the use of two applications of **SYSTEM 42** as a sealer/primer. Steel Decking should be free of rust and scale, and should be primed with **SYSTEM 42**.

NOTE: Test areas should always be installed prior to large scale application to assure compatibility and performance under actual use conditions.

3. INSTALLATION:

A. MIXING: To fully develop self-leveling properties without the use of excessive amounts of water, product should be mechanically mixed using mortar mixer, grout mixer or slow speed drill with mixing paddle (250 rpm). Avoid whipping excessive air into mixes. Add **LEVEL-X 52** powder to water and mix for 2-4 minutes to achieve a homogeneous, flowable, fine batter consistency. If excess liquid readily “bleeds” onto surface upon standing, reduce water ratio. Adjust consistency as required by adding more powder or water. Be consistent from batch to batch once optimum ratio for job conditions has been determined. Mix only as much material as can be applied in 5-10 minutes.

B. PLACEMENT: Pour or pump **LEVEL-X 52** in place and spread with screed, float, squeegee or broom. No troweling is required, unless “feather-edging” is desired at the perimeter of the pour. Sub-floor high spots should receive a minimum 1/8” cover. Do not re-temper material which has begun to set. Discard any material not used within 20 minutes of mixing. For deep sections (1" or more), the addition of up to 50% 1/4" to 1/2" gravel is

acceptable, although this will affect workability and necessitate installation of a finishing coat of neat **LEVEL-X 52**.

4. Curing: Although **LEVEL-X52** is a cement-based product, it does not require extended moist cure, and most installations will require no special curing procedures. When working in hot, dry and/or windy conditions, some misting of the surface during the first 1-3 hours after pouring may be required to avoid too-rapid drying. After this initial period, the product should be allowed to dry cure.

LEVEL-X52 must be kept from freezing for 12 hours after installation. Do not apply at temperatures below 40°F or when temperatures will drop below 40°F within 8 hours of application.

5. Storage and Handling: Store powder in dry area, off the floor. Contains cement and free silica. Avoid skin and eye contact and avoid breathing dust. Use NIOSH-approved toxic dust filter for silica. Observe all safety and handling guidelines as detailed in the Material Safety Data Sheet supplied with this product.

Keep tools clean and wet during use, and clean up immediately after use. Keep packages closed when not in use.

For further information or assistance, contact your Edison Coatings representative.

FOR COMMERCIAL AND INDUSTRIAL USE



Rev. 2/2003

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GUIDE TO THE INSTALLATION OF LEVEL -X 52, 52-XT SELF-SMOOTHING, SELF-LEVELING TOPPINGS

1.General

This publication is intended as an aide in achieving level, durable floor surfaces using Edison LEVEL-X 52 products. It is not intended for use as a specification, but rather as a more extensive set of instructions, complementing product label information. The information contained herein is believed to be reliable, but Edison Coatings, Inc. makes no warranty as to its accuracy and expressly disclaims any implied warranty of merchantability or fitness for a particular purpose. Nothing in this publication shall be construed as granting of permission or license to infringe on any patented technology.

2.What You Need to Install LEVEL-X52

The size of your project will probably have the greatest influence on your choice of product application methods. The degree of flatness required is also a central consideration. For the purpose of this publication, it is assumed that the desired finish should be smooth and level in general appearance, with some reasonable degree of variation to be considered acceptable. Super-flat flooring will not be targeted, therefore, although many of the general techniques discussed herein may also be useful in creating super-flat floors.

Small projects, involving a bag or two of LEVEL-X 52, such as many residential projects, may not require any special tools. Larger projects will benefit significantly from the use of mechanical mixing equipment, pumping equipment and/or product spreaders.

a.Priming

Applications including the use of RL-1 primer will benefit from the use of a floor brush or roller to evenly apply the primer. Ordinary paint rollers may be used.

b.Mixing Equipment

While small quantities of LEVEL-X 52 can be mixed by hand, this is too time consuming and tedious for any commercial-scale project. LEVEL-X 52 offers limited flow time, before it begins to stiffen and build strength. Time wasted in mixing by hand is therefore time lost in placing the product and achieving a smooth, level finish,

At the very least, an electric drill mixer should be considered. The type of drill which works best is a slow speed (250 .450 rpm), heavy duty (1/2 HP mm.) drill which is properly grounded, as it will be used in a damp environment. A variety of mixing attachments is commercially available, and many will work well. Rectangular mud mixers, Wagman epoxy mixers, and Jiffy mixers may all be used with the proper size container. The key is to get thorough product mixing without whipping excessive air into the material. Excess air may cause bubbles in the surface finish, and may reduce topping strength.

For larger projects, mortar mixers (not concrete mixers) may be used. A mortar mixer features slowly rotating ribbons in a stationary U-shaped drum, rather than fixed paddles or baffles in a rotating drum. Better still are the unitized grout mixing and pumping devices used for the largest applications. Typically these include one or more circular mixing chambers situated above a grout pump, allowing convenient, continuous operation. Some units also include such useful amenities as automatic water metering, assuring consistent mixes from batch to batch.

c.Material Placement

Small mixes will probably not require anything more involved than simple pouring or dumping of the mixed product onto the surface to be topped. If desired, trowels or other hand tools can be used to aid the flow and leveling of the product, particularly into corners and out to thin, feathered edges. The more “help” given the product in placement, however, the better the finished result.

It is preferable to pour the material out in ribbons across the area to be topped, rather than dumping it all in one spot. For areas where multiple batches will be used, do not spread too far. This will be covered in greater detail, later, as we address the need to maintain a ‘wet edge’ on larger projects.

Pumping provides the steadiest and most convenient placement. Grout pumps require no special modification to handle LEVEL-X 52. Just remember to flush the unit thoroughly with water before shutting down, even if just for a 10-minute break.

When restarting, the first liquid out of the pump will have an exceptionally high water content. This material should be discarded, and only material of the proper mix consistency should be placed.

d.Spreaders

Spreaders are sometimes used to help the topping achieve proper depth and finish. Again, for small applications, any type of hand trowel, squeegee or flat edge may be adequate. But on large, open expanses controlling depth is more critical, both in terms of economics and finish.

Epoxy spreaders are essentially straight edges with adjustable height guides. Once the guide depth is set, the spreader is used to push or drag the wet product, leaving behind material of the proper depth. Generally this is intended as an aide, rather than as a positive method of controlling depth. Uneven floors, in particular, will require that the worker make changes in spreading technique to deposit more material in low spots and less material in high spots. Epoxy smoothers are used to make final adjustments to height and finish, just before the product sets. The smoother is a flexible, angled blade mounted on a pole. Smoothing should not be necessary for the entire surface, only for surface irregularities.

Spreaders are generally needed only for edge work and very thin sections in pumped applications.

e.Miscellaneous

Although LEVEL-X products are designed for minimum hazard to installers, LEVEL-X 52 does contain silica sand. Silica is a toxic dust, and may cause long-term bodily harm. Read and observe all guidelines for safe handling as detailed in the Material Safety Data Sheets furnished with this product. Other ingredients are nuisance dusts. Use proper ventilation to keep work area dust levels below the TLV. Provide NIOSH-approved respiratory filters rated for toxic dust exposures (silica).

In some applications, it will be desirable for one of the installers to be able to walk through the wet product, to perform such tasks as smoothing or feather-edging. In most cases, this will leave unsightly impressions in the underlayment. To avoid such damage to the finish, workers should wear spiked shoes or golf shoes. Do not walk through material which has begun to set or which has been in place for more than 10 minutes.

Finally, a method of measuring mixing water will be required. This should depend on the number of bags being mixed per batch. LEVEL-X 52 will require between 1.5 and 2 US gallons per bag. Once the exact ratio you will use has been determined, the same level should be used for every mix. Graduated containers are best, but almost any plastic container can be marked with indelible marker to permit consistent volumetric batching.

3.Preparing Surfaces for LEVEL-X 52

The same basic guidelines apply to LEVEL-X as to any cement-based repair material. The surface being topped has to be clean and hard. Loose or crumbly materials must be removed. Paints, coatings, oils, stains or anything else that may hinder adhesion must be eliminated. While sound, bare concrete may require nothing more than sweeping or washing, some surfaces will require more aggressive preparation. This may include chemical cleaning, acid etching, scarification, sandblasting or shotblasting.

While LEVEL-X 52 has excellent adhesion characteristics it is better to apply to rough surfaces than smooth ones, and better on damp surfaces than dry ones. There should be no standing water or chalk, however.

While priming is not strictly required in most applications, it is never contraindicated. RL-1 primer is an inexpensive means of assuring adhesion to porous surfaces. For hard or smooth surfaces, it may be diluted at 1:1 with clean water. Primers may be applied by roller, brush or spray. Apply heavily enough so that material ‘stands’ for several minutes before being absorbed. If the primer is completely absorbed, reapply. If primer is allowed to dry out before topping, it should leave behind a lustrous film. If primer is dry for more than 2 hours, reapply before topping. If primer is wet during topping application, it may be necessary to slightly adjust mixing water levels to maintain proper flow and consistency.

4.How to Mix LEVEL-X 52

LEVEL-X 52 contains flow and set controlling additives which must be dissolved in order to be effective. This dissolution is aided by mechanical shear. Accordingly, not all the mixing water should be added immediately. Working a slightly dry mix will help assure that full flow and leveling is achieved when the product is placed.

Start by adding a portion of the mixing water to the mixer or mixing container. While mixing, add the LEVEL-X 52 powder in a steady flow, at a rate which allows product to be quickly incorporated in the mix. All product should be added within 2 - 3 minutes, however. As the mix becomes too dry, add the remainder of the mix water while continuing to add dry LEVEL-X, maintaining a viscous, paste consistency. Continue mixing after all water and powder have been added, and viscosity should drop, while any lumps are homogenized. If homogeneous mixes are not obtained within 4 minutes, batch size is too large for the mixer being used. If mix remains too viscous, increase water level slightly. Maximum strength is obtained when LEVEL-X 52 is mixed in accordance with label directions for mix proportions. For many applications, this produces a somewhat ‘dry’ mix, however, and it is advisable to increase water use level slightly. It is not advisable to add more than 2 US gallons per 50 pound bag, however. Some of the signals that can be observed if too much water is used include ‘bleeding’ of milky liquid onto the product’s surface, and in extreme cases, separation of a layer of liquid and LEVEL-X on the floor. NOTE: More water also slows set time.

Of course, mixing water should be clean, of drinking quality, and free of salts or other materials which may upset LEVEL-X’s cement chemistry.

5.How to Place LEVEL-X 52

Continuity is the key to a finished installation that is consistent and free of apparent ‘breaks’ in the work. This requires that all the operations - Priming, Mixing, Placement and Finishing - be manned sufficiently and coordinated in such a manner as to allow work to proceed without interruption.

Priming should be performed just far enough in advance for the primer to turn clear, rather than milky, before topping. Mixing should be paced to provide a steady flow of fresh material. This allows a “Wet edge” to be maintained as material is placed. The wet edge, consisting of soft, freshly-placed product, allows the next batch of mix to be blended into the previous batch without difficulty. When large installations are being performed, a pattern for topping the floor should be planned before starting. The approximate rate of progress should be calculated to ascertain whether some areas will set before the adjacent area is topped. If equipment capacity is inadequate or floor dimensions too large to maintain the “wet edge”, seams should be laid out in advance, and these can be marked with sturdy pressure-sensitive tape. As the work nears one of these seams, material may either be feathered into the seam or simply applied over the tape.

Tape should be lifted immediately after material stops flowing, before the product takes a hard set. Later, the next section can be blended into the previous one by placing a new strip of tape several inches beyond the original tape line, overlapping the previous work. New material is then feathered to meet the old work’s elevation, or placed to abut the original seam.

Elevation control using epoxy spreaders and smoothers has been discussed earlier. The most positive control of elevation can be exercised if actual elevations of the floor are surveyed and marked. Depending on the situation, the desired new floor elevation can be marked on columns or other fixed vertical surfaces, or guide “pins” may be adhered to the floor. A guide pin may be any sturdy material which can be cut to the required length and fastened or adhered in place. Topping level is then controlled by filling just to the point of covering the tip of the pin. Lasers may also be used to closely control the amount of material deposited.

Techniques for filling thin sections vary. Pushing the product up the “hill” and letting it flow back down is one approach. Troweling is another. Vibrating the surface with the spreader in fine up-down movements is also effective in increasing localized flow.

Thick sections are another matter. LEVEL-X can be placed up to several inches or more in depth in one application. But if floor variations are large, the time required to fill deep sections may be too long to facilitate maintenance of the “wet edge”. A technique that successfully addresses this problem is to pre-fill the largest and deepest areas first. These are allowed to set, and then a thinner, continuous topping is poured over the entire floor. For example, a floor which periodically sags into 3 or 4” cavities could be treated by first installing 2 to 3” in the low spots, and a couple of hours later, a finer leveling coat could be applied over the entire floor at ½ inch or so, as required.

6. After Placement ..

There is a limit to how much spreading and smoothing can be done. Learn to recognize the point at which the material is too far along to handle further, and let it set. Any minor imperfections can be ground or scraped shortly after set, at 2 - 6 hours’ age.

Curing is rarely required in interior applications. Under hot, dry, windy conditions, it may be necessary to keep surfaces moist for 1 - 3 hours to avoid plastic shrinkage cracking. Mist with cool water after initial set, in such cases.

After initial set, LEVEL-X builds strength rapidly. Typically, surfaces are ready for foot traffic in 2-4 hours. Carpeting, tile or resilient flooring can be installed the next day. In cases where epoxy or other impervious systems will be installed, it is important to reach the degree of dryness recommended by the finish manufacturer prior to application. Except for deep sections under damp and/or cool conditions, LEVEL-X 52 should through-dry within 24 hours. If uncertain, a simple moisture test can be performed by taping down a 2’ x 2’ polyethylene sheet with duct tape all along the edge. Allow the sheet to remain overnight. If moisture collects underneath the sheet, it is an indication that moisture level is still too high. Remove the

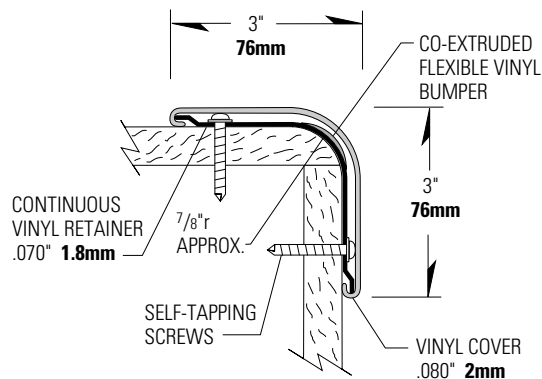
sheet and allow additional drying, and then repeat the test. Slabs on grade in high water table areas may never reach acceptable levels of dryness unless a good vapor barrier has been installed beneath the slab.

Moderate vehicular traffic is acceptable in 24 hours. Heavy traffic time is 4 - 7 days. Full cure is 28 days.

While LEVEL-X 52 is a high-strength material, highly abrasive exposures or heavy moisture exposures are best protected by a high-performance coating. Edison AQUEPOXY 250 HD and FLEXI-GARD 500-S are particularly recommended.

Generally, LEVEL-X 52 is compatible with all types of coatings and adhesives which are designed for use on concrete.

170BN BluNose High Impact Corner Guard



- ▶ 3" wing (76mm) with 90° bullnose corner protection
- ▶ Mounted on a .070" (1.8mm) thick continuous vinyl retainer with a co-extruded flexible vinyl apex
- ▶ Vinyl retainer is four times stronger than our aluminum retainer and six times stronger than any other vinyl retainer
- ▶ .080" (2mm) thick scratch and stain resistant rigid vinyl cover
- ▶ Manufactured 3' (.91m), 4' (1.22m), 8' (2.44m), 9' (2.74m) and 12' (3.66m) standard heights, custom heights available
- ▶ Available in 100 standard colors and Woodland patterns
- ▶ Meets the most rigorous standards and criteria of chemical emissions as prescribed by the GREENGUARD Environmental Institute
- ▶ Has been tested and meets GREENGUARD Environmental Institute's and the state of California's requirements for low emitting products as tested by Air Quality Sciences
- ▶ Has been tested and meets the GREENGUARD Children & School chemical emissions levels



IPC.384/REV.6

170BN BluNose High Impact Bullnose Corner Guard Suggested Specifications

PART 1 - GENERAL

1.01 SUMMARY

- A. Corner guard system for wall protection

1.02 SECTION INCLUDES

- A. 170 BluNose High Impact Surface Mount Bullnose Corner Guard System

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM)
B. National Building Code of Canada (NBC)
C. National Fire Protection Association (NFPA)
D. Society of Automotive Engineers (SAE)
E. Underwriters Laboratory (UL)
F. Underwriters Laboratory of Canada (ULC)
G. Uniform Building Code (UBC)

1.04 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide corner guard systems that conform to the following requirements of regulatory agencies and the quality control of IPC Door and Wall Protection Systems, InPro Corporation.

1. Fire Performance Characteristics: Provide UL Classified corner guards conforming with NFPA Class A fire rating. Surface burning characteristics, as determined by UL-723 (ASTM E-84), shall be flame spread of 10 and smoke development of 350 - 450. Provide ULC (Canada) listed corner guards conforming to the requirements of the National Building Code of Canada 1990, Subsection 3.1.13. Surface burning characteristics, as determined by CAN/ULC-S102.2, shall be flame spread of 15 and smoke developed of 35.
 2. Self Extinguishing: Provide corner guards with a CC1 classification, as tested in accordance with the procedures specified in ASTM D-635-74, Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position, as referenced in UBC 52-4-1988.
 3. Impact Strength: Provide rigid vinyl profile materials that have an Impact Strength of 30.2 ft-lbs/inch of thickness as tested in accordance with the procedures specified in ASTM D-256-90b, Impact Resistance of Plastics.
 4. System Impact Resistance: Provide a corner guard system that resists an impact of 153.9 ft-lbs while producing no visual blemishes upon the vinyl cover surface and no deformations in the vinyl retainers, as tested in accordance with the applicable provisions of ASTM F 476-84, paragraph 18, Impact Test.
 5. GREENGUARD Certified: Provide GREENGUARD Certified material. Profiles shall meet the requirements of GREENGUARD Certification Standards for Low-Emitting Products and GREENGUARD Product Emission Standard for Children & Schools.
 6. Chemical and Stain Resistance: Provide corner guards that show resistance to stain when tested in accordance with applicable provisions of ASTM D-543.
 7. Fungal and Bacterial Resistance: Provide rigid vinyl that does not support fungal or bacterial growth as tested in accordance with ASTM G-21 and ASTM G-22.
 8. Color Consistency: Provide components matched in accordance with SAE J-1545 - (Delta E) with a color difference no greater than 1.0 units using CIE Lab, CIE CMC, CIE LCh, Hunter Lab or similar color space scale systems.
- ### 1.05 SUBMITTALS
- A. Product Data: Manufacturer's printed product data for each type of corner guard specified.
B. Detail Drawings: Mounting details with the appropriate fasteners for specific project substrates.

- C. Samples: Verification samples of corner guard, 8" (203mm) long, in full size profiles of each type and color indicated.

- D. Manufacturer's Installation Instruction: Printed installation instructions for each corner guard.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in unopened factory packaging to the jobsite
B. Inspect materials at delivery to assure that specified products have been received.
C. Store in original packaging in a climate controlled location away from direct sunlight.

1.07 PROJECT CONDITIONS

- A. Environmental Requirements: Products must be installed in an interior climate controlled environment.

1.08 WARRANTY

- A. Standard IPC Limited Lifetime Warranty against material and manufacturing defects.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Acceptable Manufacturer: IPC Door and Wall Protection Systems, InPro Corporation, PO Box 406 Muskego, WI 53150 USA; Telephone: 800.222.5556, Fax: 888.715.8407, www.inprocorp.com

- B. Substitutions: Not permitted

- C. Provide all corner guards and wall protection from a single source.

2.02 MANUFACTURED UNITS

- A. Corner Guard System

1. 170BN BluNose High Impact Bullnose Corner Guard Profile
3" (76mm) x 3" (76mm), 90 degree Bullnose w/ 1-3/16" (30mm) radius to outside of vinyl cover
3' (.91m), 4' (1.22m), 8' (2.44m) and 9' (2.74m) standard heights. Custom heights available

2.03 MATERIALS

- A. Vinyl Covers: Snap on cover of .080" (2mm) thickness shall be extruded from chemical and stain resistant polyvinyl chloride with the addition of impact modifiers. No plasticizers shall be added (plasticizers may aid in bacterial growth).

- B. Vinyl Retainers: Continuous vinyl retainers of .070" (1.8mm) thickness with a co-extruded flexible vinyl apex shall be fabricated from polyvinyl chloride with the addition of impact modifiers.

2.04 COMPONENTS

- A. Top caps and bottom caps shall be made of injection molded thermoplastics.

- B. Fasteners: All mounting system accessories appropriate for substrates indicated on the drawings shall be provided.

2.05 FINISHES

- A. Vinyl Covers: Colors of the corner guard to be selected by the architect from the IPC finish selection. Surface shall have a pebblette texture.
B. Molded Components: Top caps and bottom caps shall be of a color matching the corner guards. Surface shall have a pebblette texture.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions in which the corner guard systems will be installed.
1. Complete all finishing operations, including painting, before beginning installation of corner guard system materials.
 - B. Wall surface shall be dry and free from dirt, grease and loose paint.

3.02 PREPARATION

- A. General: Prior to installation, clean substrate to remove dust, debris and loose particles.

3.03 INSTALLATION

- A. General: Locate corner guard as indicated on the approved detail drawings for the appropriate substrate, and in compliance with the IPC installation instructions. Install corner guard level and plumb at the height indicated on drawings.

- B. Installation of 170BN BluNose High Impact Surface Mount Bullnose Corner Guard:

1. Retainer Installation

Position the vinyl retainer against the wall, allowing $\frac{5}{16}$ " (8mm) from the bottom of the retainer to the top of the cove base or baseboard for the bottom cap.

Drywall: Secure the retainer to the wall using #8 x $1\frac{1}{4}$ " phillips round head, self-tapping screws. Stagger the fasteners on each wing of the retainer. Use 4 screws per 3' (.91m) length, 6 screws per 4' (1.22m) length, 10 screws per 8' (2.44m) length, or 12 screws per 9' (2.74m) length.

Concrete: Drill $\frac{1}{4}$ " (6.5mm) holes into the ends of the retainer for the top and bottom caps. Stagger the holes on each wing of the cap. Use the slotted tabs on the top and bottom cap to transfer hole location to the retainer. Drill $\frac{1}{4}$ " (6.5mm) holes on the two wings of the retainer. Stagger the fasteners on each wing of the retainer. Drill 4 holes per 3' (.91m) length, 6 holes per 4' (1.22m) length, 10 holes per 8' (2.44m) length, or 12 holes per 9' (2.74m) length. Transfer the location of all mounting holes to the wall. Drill $\frac{1}{4}$ " (6.5mm) holes and position ALLIGATOR anchors into the holes on the wall. Mount the retainer with #10 x $1\frac{3}{4}$ " phillips pan head screws and tighten to secure the retainer to the wall.

2. Top and Bottom Cap Installation:

Drywall: Overlap the retainer with the mounting tabs of the top and bottom caps and attach them to the retainer using two,

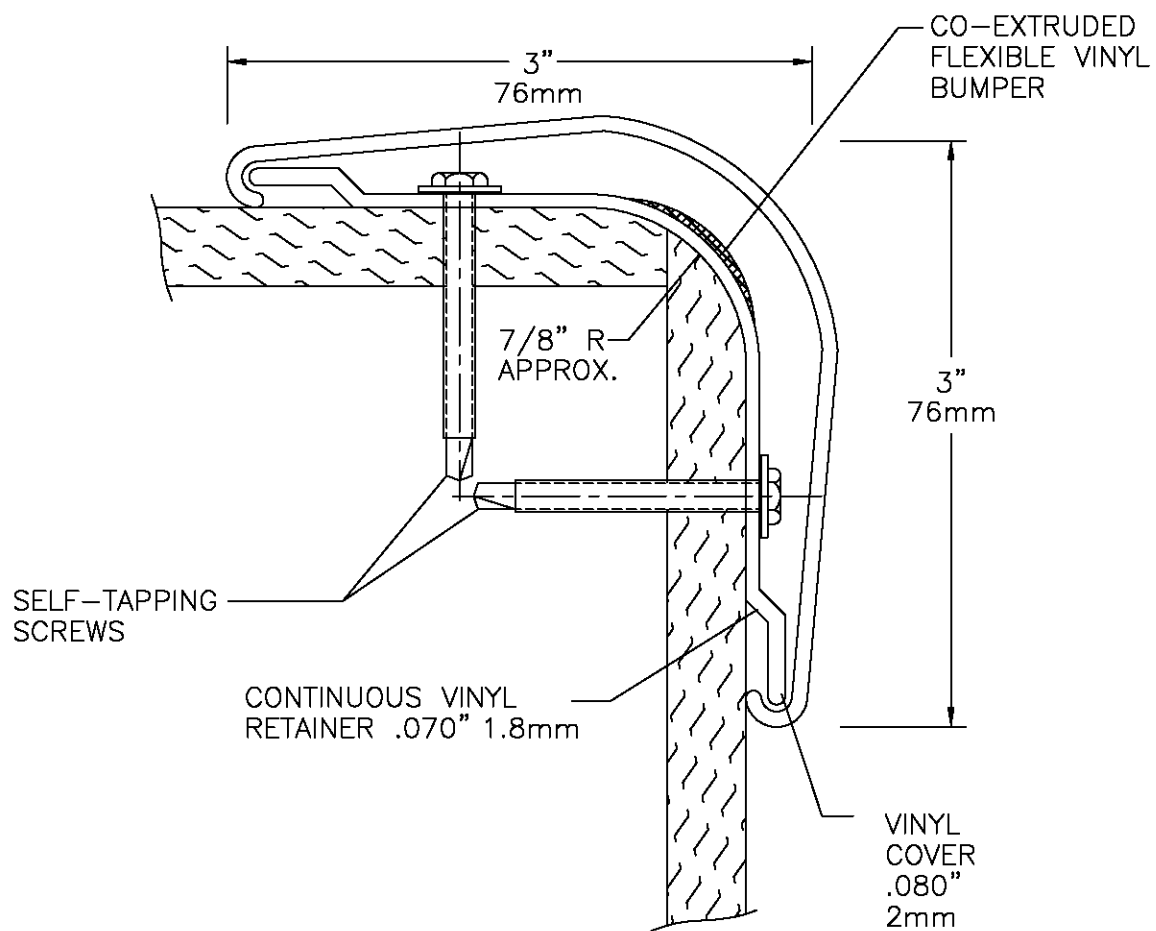
#8 x $1\frac{1}{4}$ " phillips flat head, self-tapping screws per cap. Stagger the fasteners on each wing of the cap.

Concrete: Overlap the retainer with the mounting tabs of the top and bottom caps and attach them to the retainer and into the ALLIGATOR anchors using two, #8 x $1\frac{1}{2}$ " phillips flat head screws per cap.

3. Position the vinyl cover on the retainer to check the fit. Adjust the top cap on the retainer to obtain a tight fit with the vinyl cover. Starting at the top, push the vinyl cover over the retainer pressing over the entire length until the cover snaps securely into place.
- INSTALLATION NOTE: Vinyl retainers can be field bent to angles 10° wider or 10° tighter than 90°. When doing so top and bottom caps cannot be used and the installation should be full height from floor to ceiling.

3.04 CLEANING

- A. At completion of the installation, clean surfaces in accordance with the IPC clean-up and maintenance instructions.



DATE: NOVEMBER 8, 2002

DRAWN BY: JAD

DRAWING NO.: 170-BN

170BN Series BluNose Bullnose Corner Guard

INPro CORPORATION.
Interior and Exterior Architectural Products
 S80 W18766 Apollo Drive
 Muskego, WI 53150 USA

Curtain Wall & Overhead Glazing

Curtain Wall & Overhead Glazing

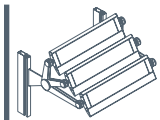
Kawneer offers a comprehensive line of architectural aluminum building products and systems for commercial construction – entrances, framing systems, windows and curtain wall systems. For over a century, Kawneer has been recognized as an innovator. Since that time, we've balanced experience with change and ongoing improvement. We strive every day to develop solutions that promote integrated, sustainable building practices, and we are dedicated to providing the tools our customers need to succeed. Thermal breaks, condensation management and building integrated photovoltaic (BIPV) and unitized curtain walls are just a few examples of how we have responded to customer needs.

HURRICANE RESISTANT AND BLAST MITIGATION PRODUCTS

Kawneer offers single-source responsibility with a comprehensive group of independently tested hurricane resistant and blast mitigation products. Many hurricane resistant products have received Notices of Acceptance (NOAs) issued by Miami-Dade County BCCO and Florida State Approvals. Blast mitigation products meet requirements of the General Services Administration (GSA), Interagency Security Committee (ISC) and Department of Defense (DoD). For more information, visit Kawneer.com.

Custom Curtain Wall

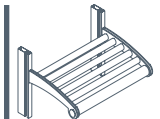
Selected for the world's most recognized buildings
Engineering and design expertise | Established leadership in major applications around the world



1600 PowerShade™, 1600 PowerWall™ and 1600 PowerSlope™

Provides a single-source solution while generating solar power and reducing energy use

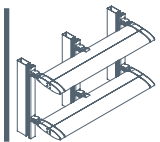
All systems are fully compatible with 1600 Wall System™1 | 1600 PowerShade™ features a dual-position pivot system that provides optimal angle and extension for shading any location | 1600 PowerWall™ and 1600 PowerSlope™ work with 1600 Wall System™1 and 1600 Sloped Glazing for vertical and sloped glazed application



Versoleil™ SunShade – Outrigger System

An economical, pre-engineered and integrated sunshade with mix-and-match design choices

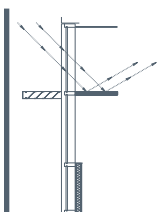
Standardized design compatible with 1600 Wall System™1, 1600 Wall System™2, 1600UT System™1, 1600 Wall System™5 and 1600 SS Curtain Wall | Shades interiors and conserves energy with 30" and 36" projection options | Outriggers, fascia caps and louvers are available in several shapes



Versoleil™ SunShade – Single Blade System

Shades of versatility in form and function

Standardized solution for seamless integration with 1600 Wall System™1, 1600 Wall System™2, 1600 Wall System™5 and 1600 SS Curtain Wall systems | Highly versatile design allows for blades to be mounted in horizontal or vertical configurations | Innovative mounting design allows for multiple angles in both horizontal and vertical configurations | Blade sizes range from 6" to 14" deep



InLighten™ Light Shelf

Reduces the need for artificial lighting by passively channeling natural daylight into an occupied space

Leverages minimal material content, sightlines, weight, installation and maintenance efforts, all while maximizing value, daylighting and design options | Light shelf features an extruded aluminum chassis system with several panel choices | Tilt feature for easy cleaning of the top reflective panel surface | Availability of depths up to 30" allows for maximizing the overall reflective surface area



1600 SS (Screw Spline) Curtain Wall (custom), 360 Insulclad™ Doors

Ryerson Image Centre and the School of Image Arts
Architects: Diamond Schmitt Architects Inc., Toronto, Ontario, Canada

Glazing Contractor: Stouffville Glass Inc., Stouffville, Ontario, Canada

Photography: © Arthur Kendrick



1600 Wall System™1 (Impact Resistant), 350 IR Doors

LECOM School of Dental Medicine, Bradenton, Florida
Architect: FAWLEYBRYANT, Sarasota, Florida

Glazing Contractor: Key Glass LLC, Bradenton, Florida
Photography: © Mark Borosch Photography

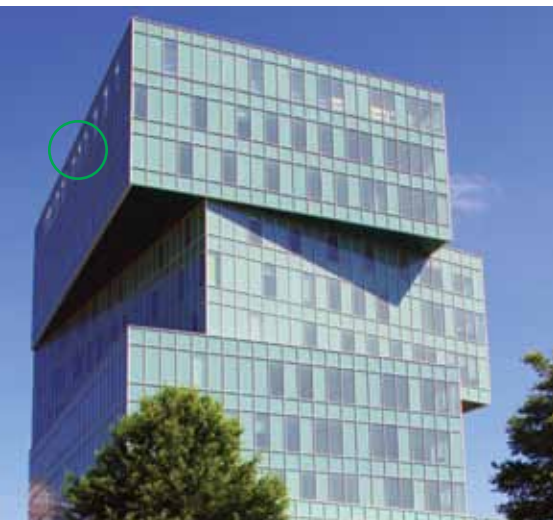


2500 PG Wall™ Curtain Wall (custom), 1600 Wall System™1, Custom SunShade

Corporate Office Tower, Houston, Texas
LEED® Platinum certified

Architect: Gensler, Houston, Texas

Glazing Contractor: Vetro Struttare LLC, Spring, Texas
Photography: © Bob Perzel



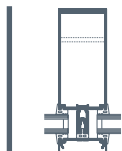
1600 Wall System™3
 UNC Charlotte Center City Building,
 Charlotte, North Carolina
 Seeking LEED® Silver certification
 Architect: Gantt Huberman Architects, Charlotte,
 North Carolina
 Glazing Contractor: SPS Corporation, Apex,
 North Carolina
 Photography: © Progress Photo



1600UT System™1 Curtain Wall, Trifab™
451UT Framing, Versoleil™ SunShades, 560
Insulclad™ Doors
 Community College of Denver – Confluence
 Building, Denver, Colorado
 Architects: OZ Architecture, Denver, Colorado;
 Collaborating Partner: Boora Architects,
 Portland, Oregon
 Glazing Contractor: Horizon Glass & Glazing
 Co., Inc., Denver, Colorado
 Photography: © CJ Berg Photographics



Clearwall™ Curtain Wall, 1600 SS (Screw Spline)
 Service Credit Union Corporate Office, Portsmouth,
 New Hampshire
 Architect: Gund Partnership, Cambridge, Massachusetts
 Glazing Contractor: Ipswich Bay Glass, Rowley,
 Massachusetts
 Photography: © Greg West



1600 Wall System™1 and 1600 Wall System™2

Reliable curtain wall systems with versatile features

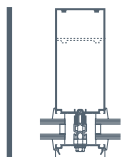
Pressure equalized systems for low- to mid-rise applications

System1 – outside glazed, captured system

System2 – outside glazed, structural silicone glazed system

Concealed fastener joinery creates a smooth, monolithic appearance |

Continuous thermal separator reduces heat gain and loss | Large- and small-missile impact tested | Blast tested to ASTM F 1642 standards



1600UT (Ultra Thermal) System™1 and 1600UT System™2

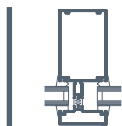
Ultra-innovative solution raises standards for thermal performance

System1 – outside glazed, captured system

System2 – outside glazed, structural silicone glazed system

Built on the success of the flagship 1600 curtain wall platform, the 1600UT System™ delivers high thermal performance, versatility, reliability and value |

Ideal for low- to mid-rise commercial applications where high thermal performing façades are needed | Accepts double or triple glazing



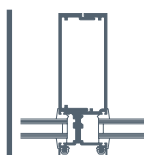
1600 Wall System™3 and 1600 Wall System™4

Inside/outside glazed curtain wall system

System3 has a 2-1/2" profile

System4 has a 2-1/4" profile

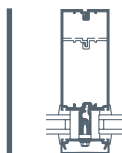
Incorporates the IsoStrut™ Thermal Break for superior structural and thermal performance | Allows for a structural silicone glazing option | Integral exterior cover and thermal isolator reduce installed cost | Inside glazing reduces installation costs | Outside glazing option for spandrel re-glazing



1600 Wall System™5

An inside glazed curtain wall/ribbon window system

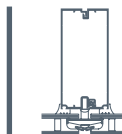
2-1/2" profile | Offered in 7-1/2" system depth and optional 6" system depth | Shear block construction for fabrication versatility | Structural silicone glazed option | Optional split mullion design with screw spline construction for ease of installation and fabrication | Allows two-color design options



1600 SS Curtain Wall/1600 SS (Pre-glazed) Curtain Wall

Shop assembled for faster field installation

Outside glazed captured or SSG curtain wall | Concealed screw spline joinery allows for shop assembly | Unique interlocking mullion design eliminates the need for anti-buckling clips | System depths and sightline match 1600 Wall System™1 and System™2 | 1600 SS (Pre-glazed) Curtain Wall allows units to be pre-glazed in the shop | 1600 SS Curtain Wall is blast tested per ASTM F 1642 and GSA-TS01-03 standards



Clearwall™ Curtain Wall

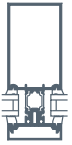
Achieves an all-glass monolithic aesthetic in a field glazed, screw spline application

Innovative toggle assembly captures glass, eliminating field application of structural silicone | Six glazing options use the toggle- based glass retention system | No structural silicone required for Clearwall™ SS/SB glazing options, which use the toggle to directly capture recessed spacer glass | Other glazing options use a metal interface attached to standard 1" insulating glass | Screw spline joinery method allows shop assembly of ladder sections, reducing field labor | Deeper mullions with shear block joinery allow for higher free span applications

1630 SS IR Curtain Wall

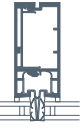
High performance, larger spans, elite impact resistance

Impact resistant 3" sightline curtain wall system offers an additional line of defense against high winds, heavy rain, hurricanes and more | Having undergone rigorous testing to hurricane impact and blast mitigation standards, the 1630 SS IR Curtain Wall meets increasing design pressure requirements and can deliver larger spans | Screw spline architecture with both dry and wet glazing options make the 1630 SS IR flexible as well as easy and fast to install



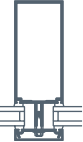
7500 Wall™

Exceptional thermal performance and resistance to condensation
 Incorporates high-performance IsoWeb™ Thermal Break
 | Accommodates 1" double-glazed or 2" triple-glazed insulating glass units | Exterior pressure glazed system



2500 PG Wall™

A high-performance unitized curtain wall system
 Available in stock length, fabricated or pre-assembled and glazed units | Unitized construction accelerates installation | Available systems include 4-sided captured, vertical and horizontal SSG (structural silicone glazed) or 4-sided SSG | 2-1/2" x 7-1/2" profile | Suitable for new construction or remodel | Dual finish capabilities



1600 L-R (Low-Rise) Wall™

Economical stock length system for low-rise applications
 Outside glazed pressure plate system available in captured or two-sided vertical SSG option | Standard 5-3/4" or 7-1/4" system depths | Shear block construction utilizing concealed fasteners



2250 L-R (Low-Rise) Wall

The economical system designed for low-rise applications
 Economical stick system with no-compromise performance | Utilizes a polymer thermal clip, allowing for easier installation and labor savings | 2-1/4" sightline | Design flexibility allows a structural silicone glazed option | Mullion drained design



2250 IG (Inside Glazed)

An economical, inside glazed ribbon window/curtain wall system
 Narrow 2-1/4" profile | Offered in 4-1/2", 6" and 7-1/2" system depths | Shear block and screw spline construction for easy fabrication | Structural silicone glazed option | Allows two-color design options | Thermally improved

Finishes

ANODIZED FINISHES

Long-lasting, protective coatings resist abrasion, corrosion and UV rays, and meet or exceed AAMA 611

Architectural Metals

Light satin is a Class I finish with a chrome-like brightness and light brushed texture | Available on a variety of products

Permanodic™ Clear Finishes

Available in Anodized Class I (#14) or Class II (#17)

Permanodic™ Color Finishes

Available in clear (Class I and Class II) and color (Class I) choices, including champagne, black, light bronze, medium bronze and dark bronze

PAINTED FINISHES

Fluoropolymer Coatings – Enduring color with high performance and durability

Available in many standard choices and unlimited custom colors | These include Permafluor™ and Permadize™ finishes, which meet or exceed AAMA 2604 or AAMA 2605

Powder Coatings – Create a “green” element with solvent-free high performance, durability and scratch resistance

Permacoat™ finishes available in 24 standard colors | Powder coatings meet or exceed AAMA 2604

NOTICE

Laws and building and safety codes governing the design and use of windows, glazed entrances, framing, curtain wall and overhead glazing products vary widely. Kawneer does not control the selection of product configuration, operating hardware or glazing materials, and assumes no responsibility thereof.

Information contained in this catalog is subject to change without notice.

OTHER PRODUCTS FROM KAWNEER

Entrances & Framing 08 41 00; Windows 08 51 00

FOR MORE INFORMATION

Visit Kawneer.com for more detailed information, including the most current Guide Specifications, CAD libraries and BIM product models.

COVER PHOTO:

1600UT System™1 Curtain Wall, Versoleil™ SunShade – Outrigger System for Curtain Wall, GLASSvent™ Windows, Trifab™ 451UT (Ultra Thermal) Framing

Colorado State University Engineering II Building, Fort Collins, Colorado

Architect: SLATERPAULL Architects, Inc., Denver, Colorado

Glazing Contractor: J.R. Butler, Inc., Denver, Colorado

Photography: © CJBerg Photography

Overhead Glazing



1600 Sloped Glazing and 2000 Skylight

Curtain wall performance in overhead glazing systems

Stick system – fully factory fabricated | Silicone glazed or captured purlin options | Flush grid exterior has a 2-1/2" sightline | Various mullion depths to meet wind and snow loads | Handles hip and valley rafter applications

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 Technology Park / Atlanta
 555 Guthridge Court
 Norcross, GA 30092

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 kawneergreen.com
 770 . 449 . 5555



KAWNEER
 AN ALCOA COMPANY

CURTAIN WALL & OVERHEAD GLAZING

kawneer.com



CURTAIN WALL & OVERHEAD GLAZING

Kawneer offers a comprehensive line of architectural aluminum building products and systems for commercial construction – entrances, framing systems, windows and curtain wall systems. For over a century, Kawneer has been recognized as an innovator. Throughout that time, we've balanced experience with change and ongoing improvement. We strive every day to develop solutions that promote integrated, sustainable building practices, and we are dedicated to providing the tools our customers need to succeed. Thermal breaks, condensation management and building integrated photovoltaic (BIPV) and unitized curtain walls are just a few examples of how we have responded to customer needs.

HURRICANE RESISTANT AND BLAST MITIGATION PRODUCTS

Kawneer offers single-source responsibility with a comprehensive group of independently tested hurricane resistant and blast mitigation products. Many hurricane resistant products have received Notices of Acceptance (NOAs) issued by Miami-Dade County BCCO and Florida State Approvals. Blast mitigation products meet requirements of the General Services Administration (GSA), Interagency Security Committee (ISC) and Department of Defense (DoD). For more information, visit Kawneer.com.

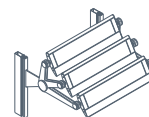
CUSTOM CURTAIN WALL

Selected for the world's most recognized buildings
Engineering and design expertise | Established leadership in major applications around the world

1600 POWERSHADE™, 1600 POWERWALL™ AND 1600 POWERSLOPE™

Provides a single-source solution while generating solar power and reducing energy use

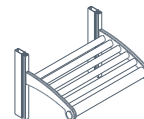
All systems are fully compatible with 1600 Wall System™1 | 1600 PowerShade™ features a dual-position pivot system that provides optimal angle and extension for shading any location | 1600 PowerWall™ and 1600 PowerSlope™ work with 1600 Wall System™1 and 1600 Sloped Glazing for vertical and sloped glazed application



VERSOLEIL™ SUNSHADE – OUTRIGGER SYSTEM

An economical, pre-engineered and integrated sunshade with mix-and-match design choices

Standardized design compatible with 1600 Wall System™1, 1600 Wall System™2, 1600UT System™1, 1600 Wall System™5 and 1600 SS Curtain Wall | Shades interiors and conserves energy with 30" and 36" projection options | Outriggers, fascia caps and louvers are available in several shapes

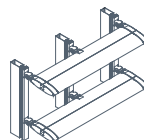


VERSOLEIL™ SUNSHADE – SINGLE BLADE SYSTEM

Shades of versatility in form and function

Standardized solution for seamless integration with 1600 Wall System™1, 1600 Wall System™2, 1600 Wall System™5 and 1600 SS Curtain Wall systems

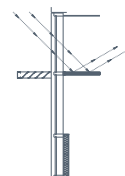
| Highly versatile design allows for blades to be mounted in horizontal or vertical configurations
| Innovative mounting design allows for multiple angles in both horizontal and vertical configurations | Blade sizes range from 6" to 14" deep



INLIGHTEN™ INTERIOR LIGHT SHELF

Reduces the need for artificial lighting by passively channeling natural daylight into an occupied space

Leverages minimal material content, sightlines, weight, installation and maintenance efforts, all while maximizing value, daylighting and design options | Light shelf features an extruded aluminum chassis system with several panel choices | Tilt feature for easy cleaning of the top reflective panel surface | Depths up to 30" allows for maximizing the overall reflective surface area



1600 SS (Screw Spline) Curtain Wall System (custom), 360 Insulclad™ Entrances

Ryerson Image Centre and the School of Image Arts

Architects: Diamond Schmitt Architects Inc., Toronto, Ontario, Canada

Glazing Contractor: Stouffville Glass Inc., Stouffville, Ontario, Canada

Photography: © Arthur Kendrick



1600 SS IR Curtain Wall System, 350 IR Entrances
LeeTran Administration & Operations Building, Fort Myers, Florida

Architect: AECOM USA, Los Angeles, California

Glazing Contractor: Key Glass LLC, Bradenton, Florida

Photography: © Bob Perzel



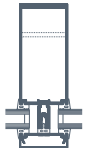
Pre-Glazed Curtain Wall (custom), 1600 Wall System™1, Custom SunShade
Corporate Office Tower, Houston, Texas

LEED® Platinum certified

Architect: Gensler, Houston, Texas

Glazing Contractor: Vetro Struttare LLC, Spring, Texas

Photography: © Bob Perzel



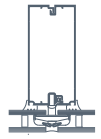
1600 WALL SYSTEM™1 AND 1600 WALL SYSTEM™2 CURTAIN WALL

Reliable curtain wall systems with versatile features
Pressure-equalized systems for low- to mid-rise applications

System1: outside glazed, captured system

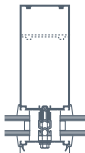
System2: outside glazed, structural silicone glazed system

Concealed fastener joinery creates a smooth, monolithic appearance | Continuous thermal separator reduces heat gain and loss | Large- and small-missile impact tested | Blast tested to ASTM F 1642 standards



CLEARWALL™ CURTAIN WALL SYSTEM

Achieves an all-glass monolithic aesthetic in a field-glazed, screw spline application
Innovative toggle assembly captures glass, eliminating field application of structural silicone | Six glazing options use the toggle-based glass retention system | No structural silicone required for Clearwall™ SS/SB glazing options, which use the toggle to directly capture recessed spacer glass | Other glazing options use a metal interface attached to standard 1" insulating glass | Screw spline joinery allows shop assembly of ladder sections, reducing field labor | Deeper mullions with shear block joinery allow for higher free span applications



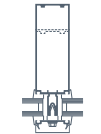
1600UT (ULTRA THERMAL) SYSTEM™1 AND 1600UT SYSTEM™2 CURTAIN WALL

Ultra-innovative solution raises standards for thermal performance

System1: outside glazed, captured system

System2: outside glazed, structural silicone glazed system

Built on the success of the flagship 1600 curtain wall platform, the 1600UT System™ delivers high thermal performance, versatility, reliability and value | Ideal for low- to mid-rise commercial applications where high thermal performing façades are needed | Accepts double or triple glazing



1620/1620 SSG CURTAIN WALL SYSTEM

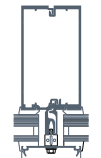
See less so you can see more

With a slimmed-down sightline and design features that have been tested to U.S. and Canadian standards, the 1620/1620 SSG Curtain Wall System allows you to see more | Delivers the desired narrow sightline aesthetic of many traditional storefront products packaged with performance levels expected of a curtain wall system | The stick-fabricated, pressure-glazed curtain wall system is available as a four-sided captured system and offers a vertical SSG mullion option



1600 WALL SYSTEM™5 CURTAIN WALL

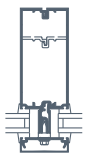
An inside glazed curtain wall/ribbon window system 2-1/2" profile | Offered in 7-1/2" system depth and optional 6" system depth | Shear block construction for fabrication versatility | Structural silicone glazed option | Optional split mullion design with screw spline construction for ease of installation and fabrication | Allows two-color design options



1630 SS IR CURTAIN WALL SYSTEM

High performance, larger spans, elite impact resistance

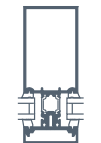
Impact resistant 3" sightline curtain wall system offers an additional line of defense against high winds, heavy rain, hurricanes and more | Having undergone rigorous testing to hurricane impact and blast mitigation standards, the 1630 SS IR Curtain Wall meets increasing design pressure requirements and can deliver larger spans | Screw spline architecture with both dry and wet glazing options make the 1630 SS IR flexible as well as easy and fast to install



1600 SS CURTAIN WALL SYSTEM/ 1600 SS (PRE-GLAZED) CURTAIN WALL SYSTEM

Shop assembled for faster field installation

Outside glazed captured or SSG curtain wall | Concealed screw spline joinery allows for shop assembly | Unique interlocking mullion design eliminates the need for anti-buckling clips | System depths and sightline match 1600 Wall System™1 and System™2 | 1600 SS (Pre-glazed) Curtain Wall allows units to be pre-glazed in the shop | 1600 SS Curtain Wall is blast tested per ASTM F 1642 and GSA-TS01-03 standards



7500 WALL™ CURTAIN WALL SYSTEM

Exceptional thermal performance and resistance to condensation

Incorporates high-performance IsoWeb™ thermal break | Accommodates 1" double-glazed or 2" triple-glazed insulating glass units | Exterior pressure glazed system



1620/1620 SSG Curtain Wall System
Scott Family Amazeum, Bentonville, Arkansas
Architect: Haizlip Studio, Memphis, Tennessee
Glazing Contractor: RGC Glass, Fayetteville, Arkansas
Photography: © Bob Perzel



1600UT System™1 Curtain Wall,
Versoleil™ SunShade – Outtrigger System
for Curtain Wall, GLASSvent™ Windows,
Trifab™ 451UT (Ultra Thermal) Framing
Colorado State University Engineering II Building,
Fort Collins, Colorado
Architect: SLATERPAULL Architects Inc.,
Denver, Colorado
Glazing Contractor: J.R. Butler Inc.,
Denver, Colorado
Photography: © CJ Berg Photographics



Clearwall™ Curtain Wall System,
1600 SS (Screw Spline) Curtain Wall System
Service Credit Union Corporate Office,
Portsmouth, New Hampshire
Architect: Gund Partnership,
Cambridge, Massachusetts
Glazing Contractor: Ipswich Bay Glass,
Rowley, Massachusetts
Photography: © Greg West



2250 L-R (LOW-RISE) WALL SYSTEM

The economical system designed for low-rise applications

Economical stick system with no-compromise performance | Utilizes a polymer thermal clip, allowing for easier installation and labor savings | 2-1/4" sightline | Design flexibility allows a structural silicone glazed option | Mullion drained design



2250 IG (INSIDE GLAZED) CURTAIN WALL SYSTEM

An economical, inside glazed ribbon window/curtain wall system

Narrow 2-1/4" profile | Offered in 4-1/2", 6" and 7-1/2" system depths | Shear block and screw spline construction for easy fabrication | Structural silicone glazed option | Allows two-color design options | Thermally improved

2500 UT UNITWALL™ SYSTEM

Exceptional performance with expansive aesthetics | Ultra-thermal unitized curtain wall system | Unitized construction accelerates installation | Reduced fabrication and assembly times due to the one-piece polyamide thermal break | Available systems include 4-sided captured, vertical SSG (structural silicone glazed) or 4-sided SSG | 2-1/2" sightline and 7-1/2" captured system depth or 6-1/2" 4-sided SSG system depth | Exceptional choice for new construction or remodel

WINDOW WALL



METROVIEW™ FG 501T WINDOW WALL

Urban elegance with an economical point of view | The look of a curtain wall in a slab-to-slab framing system for dramatic floor-to-ceiling views | Range of aesthetic options including integrated slab edge covers | Balcony doors and GLASSvent™ UT windows can be integrated into the system | Screw spline fabrication and joinery means easy construction and low installation cost | 2-1/4" sightline with standard 5" system depth | Ideal for mid-rise commercial projects and multi-family housing



PG 123™ FRAMING

Ribbon window and multi-lite punched opening system with pre-glaze capability | 2-1/4" x 6" frame members accept 1" infill with 1/4" adaptors for spandrel applications | Square cuts with no miters or notching reduces fabrication time | Can be pre-assembled and pre-glazed under controlled shop conditions, saving time compared to field construction | Pre-glazed units installed from interior, minimizing weather delays and scaffolds/lift equipment



TRACO TR-700 WINDOW WALL

Multi-faceted system for flexible design | Versatile enough to blend into historic applications or add a unique element to new construction | 4-5/8" frame depth provides extra coverage for larger wall cavities | Accepts Traco TR-700 series projecting and casement windows | Terrace and sliding doors also available

Kawneer Company, Inc.
Technology Park / Atlanta
555 Guthridge Court
Norcross, GA 30092

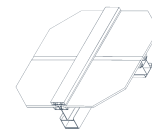
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kawneergreen.com
770 . 449 . 5555

OVERHEAD GLAZING

1600 SLOPED GLAZING AND 2000 SKYLIGHT

Curtain wall performance in overhead glazing systems

Stick system – fully factory fabricated | Silicone glazed or captured purlin options | Flush grid exterior has a 2-1/2" sightline | Various mullion depths to meet wind and snow loads | Handles hip-and-valley rafter applications



FINISHES

ANODIZED FINISHES

Long-lasting, protective coatings resist abrasion, corrosion and UV rays, and meet or exceed AAMA 611

Architectural Metals

Light satin is a Class I finish with a chrome-like brightness and light brushed texture | Available on a variety of products

Permanodic™ Clear Finishes

Available in Anodized Class I (#14) and Class II (#17)

Permanodic™ Color Finishes

Available in clear (Class I and Class II) and color (Class I) choices, including champagne, black, light bronze, medium bronze and dark bronze

PAINTED FINISHES

Fluoropolymer Coatings – Enduring color with high performance and durability

Available in many standard choices and unlimited custom colors | These include Permafluor™ and Permadize™ finishes, which meet or exceed AAMA 2604 or AAMA 2605

Powder Coatings – Create a “green” element with solvent-free high performance, durability and scratch resistance

Permacoat™ finishes available in 24 standard colors | Powder coatings meet or exceed AAMA 2604

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OTHER PRODUCTS

FROM KAWNEER
Entrances & Framing 08 41 00
Windows 08 51 00

FOR MORE INFORMATION

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COVER PHOTO:

1600 Wall System™2 Curtain Wall (custom four-sided structural silicone glazed veneer system)

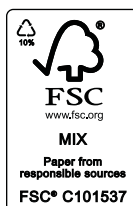
Museum at Prairiefire, Overland Park, Kansas

Architect: Verner Johnson, Inc., Boston, Massachusetts

LEED® Silver certified

Glazing Contractor: JPI Glass, Kansas City, Missouri

Photography: © Bob Perzel



KAWNEER
AN ALCOA COMPANY

GENERAL NOTES:

1. THESE CURTAIN WALL SYSTEMS HAVE BEEN TESTED, ANALYZED & APPROVED FOR DESIGN PRESSURES NOT TO EXCEED THOSE SHOWN IN THE "ALLOWABLE DESIGN PRESSURE TABLE(S).
2. OPENINGS, BUCKING & BUCKING FASTENERS MUST BE PROPERLY DESIGNED & INSTALLED TO TRANSFER WIND LOADS TO THE STRUCTURE.
3. ALL HARDWARE & FASTENERS SHALL BE IN ACCORDANCE WITH THESE DRAWINGS & SHALL NOT VARY UNLESS SPECIFICALLY MENTIONED ON THE DRAWINGS. SPECIFIED ANCHOR EMBED TO BASE MATERIAL SHALL BE BEYOND WALL FINISH OR STUCCO.
4. THE DETAILS & SPECIFICATIONS SHOWN HEREIN REPRESENT THE PRODUCTS TESTED & PROPOSED FOR WATER, AIR, IMPACT, CYCLIC & UNIFORM STATIC AIR PRESSURE TESTING IN CONFORMANCE WITH ASTM E330, E283, E331, E1886 & E1996 FOR LARGE MISSILE IMPACT CURTAIN WALL SYSTEMS.
5. THESE CURTAIN WALL SYSTEMS HAVE BEEN DESIGNED IN ACCORDANCE WITH AND MEET THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (IBC).
6. IMPACT SHUTTERS ARE NOT REQUIRED WITH THIS CURTAIN WALL SYSTEM.
7. ALL ANCHORS SECURING CURTAIN WALL FRAME TO PRESSURE TREATED BUCKS OR WOOD FRAMING SHALL BE CAPABLE OF RESISTING CORROSION CAUSED BY THE PRESSURE TREATING CHEMICALS IN THE WOOD.
8. DETERMINE THE POSITIVE & NEGATIVE DESIGN LOADS TO USE WHEN REFERENCING THESE DOCUMENTS IN ACCORDANCE WITH THE GOVERNING CODE AND GOVERNING WIND VELOCITY. FOR WIND LOAD CALCULATIONS IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, A DIRECTIONALITY FACTOR OF KD = 0.85 MAY BE APPLIED PER THE ASCE-7 STANDARD.
9. NO INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE CERTIFICATION OF THIS PRODUCT. WIND LOAD DURATION FACTOR CD = 1.6 WAS USED FOR WOOD SCREW ANALYSIS ONLY.
10. MATERIALS, INCLUDING BUT NOT LIMITED TO STEEL SCREWS, THAT COME INTO CONTACT WITH OTHER DISSIMILAR MATERIALS SHALL BE SEPARATED OR COATED AS REQUIRED TO AVOID CORROSION OF EITHER MATERIAL.
11. THERE SHALL BE NO LIMIT TO THE NUMBER OF HORIZONTAL & VERTICAL PANELS USED FOR ANY JOB PROVIDING ALL RESTRICTIONS ARE MET PER THE ELEVATIONS.
12. TO THE BEST OF OUR KNOWLEDGE, THE CURTAIN WALL SYSTEMS SHOWN HEREIN ARE QUALITY ASSURED BY AN APPROVED CERTIFICATION/QA ENTITY & SHALL BE LABELED IN ACCORDANCE WITH APPLICABLE STANDARDS. THESE DRAWINGS SHOW ALL APPLICABLE ELEVATION, COMBINATION, INSTALLATION & COMPARATIVE ANALYSIS CONDITIONS AS DETERMINED THROUGH TESTING & ENGINEERING RATIONAL ANALYSIS. CURTAIN WALL ASSEMBLY SHALL BE IN ACCORDANCE WITH THESE DRAWINGS, THE MANUFACTURER'S QUALITY ASSURANCE SPECIFICATIONS & TESTING REPORTS.
13. CERTIFICATION OF THESE CURTAIN WALL SYSTEMS SHALL BE CONSIDERED VOID IF THEY ARE INSTALLED WITHOUT A BUILDING PERMIT FROM THE APPLICABLE LOCAL BUILDING DEPARTMENT OR IF THEY ARE INSTALLED BY ANYONE OTHER THAN A LICENSED CONTRACTOR EXPERIENCED WITH CURTAIN WALL INSTALLATIONS.

CORNER CONSTRUCTION:

ONE-PIECE VERTICAL AND HORIZONTAL FRAMING AND INTERMEDIATES: VERTICAL MEMBERS RUN THROUGH WHILE THE HORIZONTAL MEMBERS ARE SQUARE CUT, BUTTED AND MECHANICALLY FASTENED TO THE VERTICAL MEMBERS VIA A SHEAR BLOCK (ITEM #9). THE SHEAR BLOCK IS MECHANICALLY FASTENED TO THE VERTICAL FRAME MEMBER WITH 4 NO. 12 X 7/16" PHTF SCREWS. THE HORIZONTAL FRAME MEMBERS ARE ATTACHED TO THE SHEAR BLOCK WITH 2 NO. 12 X 1 1/2" FHTF SCREWS. CORNERS ARE SEALED WITH DOW 795 SILICONE SEALANT.

TWO-PIECE VERTICAL AND HORIZONTAL FRAMING AND INTERMEDIATES: VERTICAL MEMBERS RUN THROUGH WHILE THE HORIZONTAL MEMBERS ARE SQUARE CUT, BUTTED AND MECHANICALLY FASTENED TO THE VERTICAL MEMBERS VIA A SHEAR BLOCK (ITEM #9). THE SHEAR BLOCK IS MECHANICALLY FASTENED TO THE VERTICAL FRAME MEMBER WITH 4 NO. 12 X 7/16" PHTF SCREWS & . THE HORIZONTAL FRAME MEMBERS ARE ATTACHED TO THE SHEAR BLOCK WITH 2 FH & 2 PH NO. 12 X 1 1/2" FHTF SCREWS. CORNERS ARE SEALED WITH DOW 795 SILICONE SEALANT.

THESE DRAWINGS ARE APPLICABLE ONLY TO THE PRODUCT SPECIFIED. THEY MAY NOT BE USED FOR THE ASSEMBLY AND/OR INSTALLATION OF ANY OTHER PRODUCT NOR MAY THEY BE USED FOR RATIONAL AND/OR LOCAL APPROVAL OF ANY PRODUCT NOT PRODUCED BY THE MANUFACTURER STATED ON THESE DRAWINGS.

ANCHOR LEGEND	
ANCHOR SYMBOL	ANCHOR DESCRIPTION
	STANDARD WIND LOAD ANCHOR
	STANDARD T-ANCHOR
	DOOR JAMB U-ANCHOR
	F-ANCHOR (FRAME MEMBER ENDS)
SEE SHEETS 4-6 FOR DETAILS OF ANCHORS	

GLASS D.L.O. SIZE VS. PRESSURE			
GLASS OPTIONS	MAXIMUM D.L.O. WIDTH	MAXIMUM D.L.O. HEIGHT	ALLOWABLE DESIGN PRESSURE
1, 2, 3, 6 & 7	58 1/2"	93 1/2"	+/-90 PSF
	57 3/4"	94 3/4"	+/-90 PSF
	73 3/4"	54 5/8"	+/-90 PSF
4 & 5	58 1/2"	93 1/2"	+/-65 PSF
	57 3/4"	94 3/4"	+/-65 PSF
	73 3/4"	54 5/8"	+/-65 PSF
8	58 1/2"	93 1/2"	+/-110 PSF
	57 3/4"	94 3/4"	+/-110 PSF
	73 3/4"	54 5/8"	+/-110 PSF
SEE GLAZING DETAILS FOR GLASS OPTIONS			
HEIGHT & WIDTH MAY NOT BE INTERCHANGED!			

EVALUATION OF THIS PRODUCT IS BASED ON APPLICABLE STANDARDS AND/OR INFORMATION & RESULTS FROM APPLICABLE TEST REPORTS. THE BUILDING CODE VERSION CONSIDERED WITH THIS EVALUATION WAS THAT IN FORCE AT THE TIME OF THE EVALUATION. IN THE EVENT OF CODE VERSION CHANGES/UPDATES OR IN THE EVENT THAT NEW OR ADDITIONAL TESTING IS COMPLETED ON THIS PRODUCT, PRIOR TO STATING CODE COMPLIANCE, THE MANUFACTURER SHALL CONFIRM WITH THE EVALUATION ENGINEER OF RECORD THAT EVERYTHING SPECIFIED HERE-IN IS CURRENT WITH ALL CURRENT TESTING, CODES AND APPLICABLE STANDARDS.

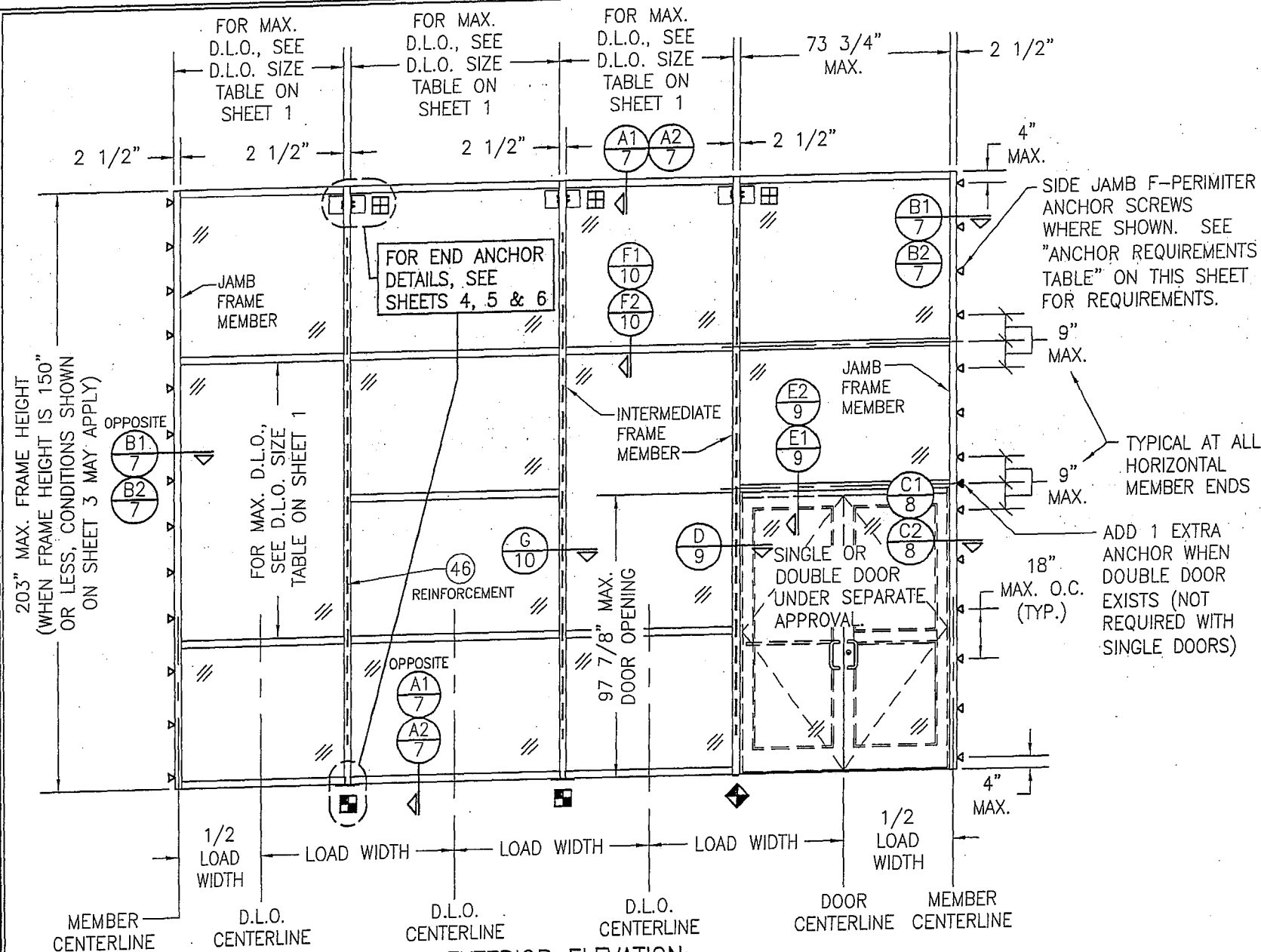
ANCHOR REQUIREMENTS TABLE
(SINGLE SPAN REINFORCED & NON-REINFORCED CURTAIN WALL)

OPENING TYPE (SUBSTRATE)	FRAME/CLIP TO OPENING FASTENER TYPE	MINIMUM EMBED	MINIMUM EDGE DIST.
F-PERIMETER ANCHOR SCREWS			
MIN. 16 GA. 50 KSI METAL STUD	1/4-14 GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
MIN. 2X6 WOOD FRAME OR BUCK (MIN. GR. 2 & G=0.55)	1/4" DIA. GR. 5 COARSE THREAD SCREW	1 1/4"	3/4"
MIN. 1/8" THK A36 STEEL	1/4-14 OR 20 GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
MIN. 3000 PSI CONCRETE	(1) 3/8" CONCRETE SCREW ANCHOR	2 1/2"	2 1/2"
T, F & U-ANCHOR SCREWS/BOLTS (VERTICAL MEMBER ENDS)			
MIN. 1/4" THK A36 STEEL	3/8"-16 430 SS HCMS OR GR. 5 CS THREAD FORMING SCREW	FULL	3/4"
	3/8" GR. 5 CS OR 410 SS BOLT WITH LOCK WASHER & NUT	FULL	3/4"
	1/4-14 OR 20 GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
	1/4" GR. 5 CS OR 410 SS BOLT WITH LOCK WASHER & NUT	FULL	1/2"
	5/16-24 GR. 5 SELF TAP/DRILL SCREW	FULL	5/8"
	5/16" GR. 5 CS OR 410 SS BOLT WITH LOCK WASHER & NUT	FULL	5/8"
(2) MIN. 3000 PSI CONCRETE	(1) 1/2" CONCRETE SCREW ANCHOR	3 1/4"	SEE DETAILS

- (1) 1/2" CONCRETE SCREWS SHALL BE SIMPSON STRONG-TIE TITAN HD SCREW ANCHOR (GALVANIZED STEEL).
- (2) MINIMUM CONCRETE SLAB THICKNESS FOR PLACEMENT OF "T", "F" & "U" ANCHORS IS 6 3/4".



DRAWN BY: W.W.S.	CHECKED BY: W.W.S.
PLOT: 1=48	DATE: 03/16/13
DATE	BY
REVISION DESCRIPTION	
NO.	
DRAWING TITLE 10 13/16" DEEP 1600 SYSTEM 1 CURTAIN WALL (L.M.I.)	
CONSULTANTS W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) 7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424	JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIDGE COURT NORCROSS, GA 30092 770-449-5555
CERTIFICATION MAR 20 2013	WARREN W. SCHAEFER, P.E. P.E. NO. 113497
DRAWING NO. 1794T	REV.
SHEET NO. 1	OF 12



**EXTERIOR ELEVATION:
SINGLE-SPAN REINFORCED CURTAIN WALL**

SCALE: 1/4" = 1'-0"

NOTES APPLICABLE TO SINGLE-SPAN REINFORCED CURTAIN WALLS

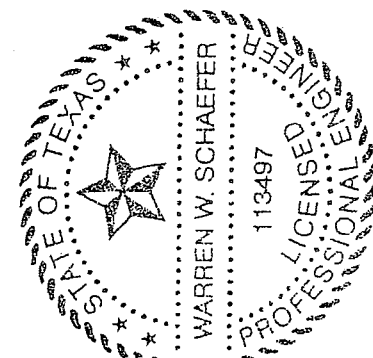
1. REINFORCEMENT SHALL RUN CONTINUOUS IN INTERMEDIATE VERTICAL MEMBERS & EXTEND TO WITHIN 17 1/2" OF THE ENDS.
2. THERE IS NO LIMIT TO THE NUMBER OF SECTIONS HORIZONTALLY PROVIDING THE OPENING IS DESIGNED TO SUPPORT THE LOADS TRANSFERRED FROM THE WALL SYSTEM.
3. THE SINGLE-SPAN ELEVATION SHOWN SHOWS ONE DOOR SECTION. MULTIPLE DOOR SECTIONS MAY OCCUR SIDE-BY SIDE IN ONE WALL SYSTEM PROVIDING ALL REQUIREMENTS WITHIN THIS DRAWING ARE MET & PROPER LOAD WIDTH (DISTANCE BETWEEN DOOR CENTERS) IS CONSIDERED WHEN DETERMINING ALLOWABLE DESIGN PRESSURE.
4. ALTHOUGH A DOOR SECTION IS SHOWN AT A SIDE JAMB, THAT SECTION MAY EXIST WITH OR WITHOUT A DOOR & THE DOOR MAY EXIST IN ANY BAY.
5. THE ELEVATION HERE-IN SHOWS T-ANCHORS AT THE BASE OF THE WALL ONLY. THESE ANCHORS MAY ALSO BE USED AT THE TOP OF A WALL IN LIEU OF THE WIND LOAD ANCHORS SHOWN PROVIDING THEY ARE INSTALLED THE SAME AS SHOWN AT THE BASE.
6. DOOR OPENINGS WIDER THAN THAT SHOWN ARE NOT PART OF THE SCOPE OF THIS APPROVAL. IF WIDER DOOR OPENINGS ARE REQUIRED, THEY SHALL BE EVALUATED & CERTIFIED UNDER SEPERATE JOB APPROVAL.

**ALLOWABLE DESIGN PRESSURE
(SINGLE SPAN
NON-REINFORCED
CURTAIN WALL)**

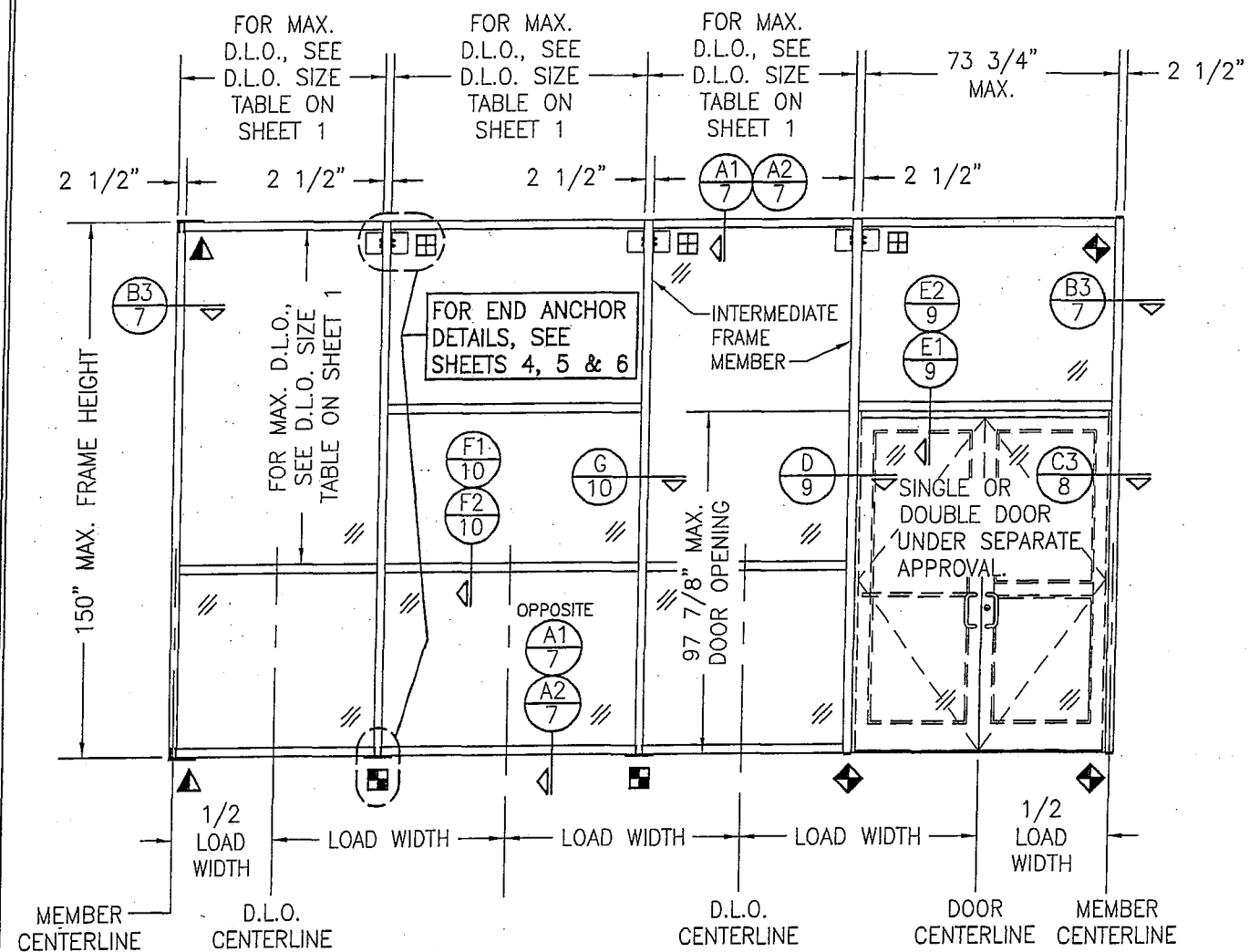
MAXIMUM MULLION SPAN (IN.)	MAXIMUM LOAD WIDTH (IN.)	ALLOWABLE PRESSURE (POS & NEG PSF)
203	76 1/4	81.0
	72	85.8
	68 5/8	90.0
	62	99.6
	56	110.0
192	76 1/4	85.6
	72	90.7
	68 5/8	95.2
	62	105.3
	59	110.0
180 & LESS	76 1/4	90.0
	72	95.3
	68 5/8	100.0
	62	110.0

NOTES:

1. SEE ELEVATION FOR DIMENSIONING OF LOAD WIDTH.
2. PRESSURES SHOWN ARE SPECIFIC TO EACH INDIVIDUAL MULLION SUPPORT AREA. ALLOWABLE PRESSURE MAY VARY FROM BAY TO BAY AS DICTATED BY EACH INDIVIDUAL MULLION CONDITION.
3. LESSER OF PRESSURES STATED IN THIS TABLE & THE ALLOWABLE GLASS PRESSURE, AS SHOWN ON SHEET 1, SHALL CONTROL AS ALLOWABLE FOR THE WALL ASSEMBLY.
4. AT SPAN OF 180" & LESS, LOAD WIDTH CONTROLS THE ALLOWABLE PRESSURE. THEREFORE, IT SHALL NOT BE ASSUMED THAT INTERPRETATION OF PRESSURE VALUES CAN BE DONE WITH SPANS UNDER 180". INTERPRETATION OF PRESSURE VALUES BETWEEN THOSE SHOWN MAY APPLY.



DRAWN BY: W.W.S.		CHECKED BY: W.W.S.	
PLOT: 1=48		DATE: 03/16/13	
NO.	REVISION DESCRIPTION	DATE	BY
DRAWING TITLE: 10 13/16" DEEP 1600 SYSTEM 1 CURTAIN WALL (L.M.I.) CONSULTANTS: W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555 7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424			
CERTIFICATION MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497		DRAWING NO. 1794T SHEET NO. 2 OF 12	



**EXTERIOR ELEVATION:
SINGLE-SPAN NON-REINFORCED CURTAIN WALL**

SCALE: 1/4" = 1'-0"

NOTES APPLICABLE TO SINGLE-SPAN NON-REINFORCED CURTAIN WALLS

1. THE ELEVATION SHOWN ILLUSTRATES SIDE JAMB FRAME MEMBERS WITH FULL SPANS END SUPPORTED BY "F" OR "U" ANCHORS. IT IS OPTIONAL TO OMIT THE "F" & "U" ANCHORS AND INSTALL THE SIDE JAMB F-PERIMETER ANCHOR SCREWS AS SHOWN IN THE REINFORCED WALL ELEVATION ON SHEET 2.
2. THERE IS NO LIMIT TO THE NUMBER OF SECTIONS HORIZONTALLY PROVIDING THE OPENING IS DESIGNED TO SUPPORT THE LOADS TRANSFERRED FROM THE WALL SYSTEM.
3. THE SINGLE-SPAN ELEVATION SHOWN SHOWS ONE DOOR SECTION. MULTIPLE DOOR SECTIONS MAY OCCUR SIDE-BY-SIDE IN ONE WALL SYSTEM PROVIDING ALL REQUIREMENTS WITHIN THIS DRAWING ARE MET & PROPER LOAD WIDTH (DISTANCE BETWEEN DOOR CENTERS) IS CONSIDERED WHEN DETERMINING ALLOWABLE DESIGN PRESSURE.
4. ALTHOUGH A DOOR SECTION IS SHOWN AT A SIDE JAMB, THAT SECTION MAY EXIST WITH OR WITHOUT A DOOR & THE DOOR MAY EXIST IN ANY BAY.
5. THE ELEVATION HERE-IN SHOWS T-ANCHORS AT THE BASE OF THE WALL ONLY. THESE ANCHORS MAY ALSO BE USED AT THE TOP OF A WALL IN LIEU OF THE WIND LOAD ANCHORS SHOWN PROVIDING THEY ARE INSTALLED THE SAME AS SHOWN AT THE BASE.
6. DOOR OPENINGS WIDER THAN THAT SHOWN ARE NOT PART OF THE SCOPE OF THIS APPROVAL. IF WIDER DOOR OPENINGS ARE REQUIRED, THEY SHALL BE EVALUATED & CERTIFIED UNDER SEPERATE JOB APPROVAL.
7. WHEN THERE IS NO CONTINUOUS JAMB SUPPORT, THE MINIMUM & MAXIMUM ALLOWABLE SPACE BETWEEN JAMB FRAME MEMBERS & THE OPENING SUBSTRATE OR FINISHES SHALL BE SPECIFIED BY THE ENGINEER OR ARCHITECT OF RECORD FOR EACH JOB BUT SHALL NOT BE LESS THAN 1/2" NOR GREATER THAN 1 3/8". WHEN CONSIDERING TYPE, DEPTH & JOINT SPAN OF SEALANT, THE ENGINEER/ARCHITECT SHALL TAKE INTO CONSIDERATION THE DEFLECTION OF THE JAMB MEMBER THAT WOULD OCCUR WHILE SUPPORTING THE JOB REQUIRED DESIGN WIND PRESSURE. ALSO TO BE CONSIDERED SHALL BE THE MATERIALS & SURFACES TO WHICH THE SEALANT WILL BE APPLIED.

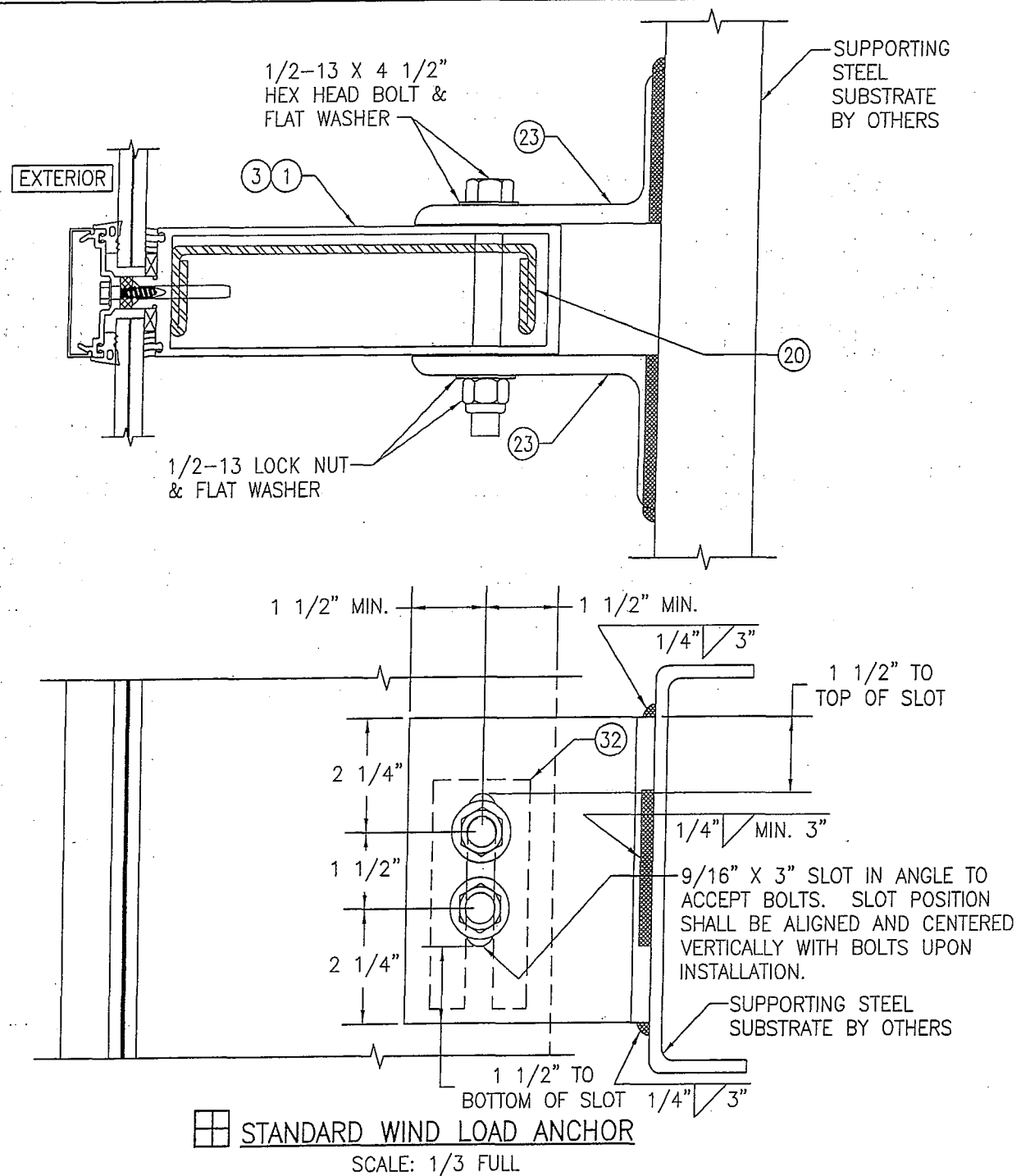
**ALLOWABLE DESIGN PRESSURE
(SINGLE SPAN REINFORCED CURTAIN WALL)**

MAXIMUM MULLION SPAN (IN.)	MAXIMUM LOAD WIDTH (IN.)	ALLOWABLE PRESSURE (POS & NEG PSF)
150	76 1/4	81.0
	72	85.8
	68 5/8	90.0
	62	99.6
144	56	110.0
	76 1/4	84.4
	72	89.4
	68 5/8	93.8
132 & LESS	62	103.8
	58	110.0
	76 1/4	90.0
	72	95.3
	68 5/8	100.0
	62	110.0

NOTES:

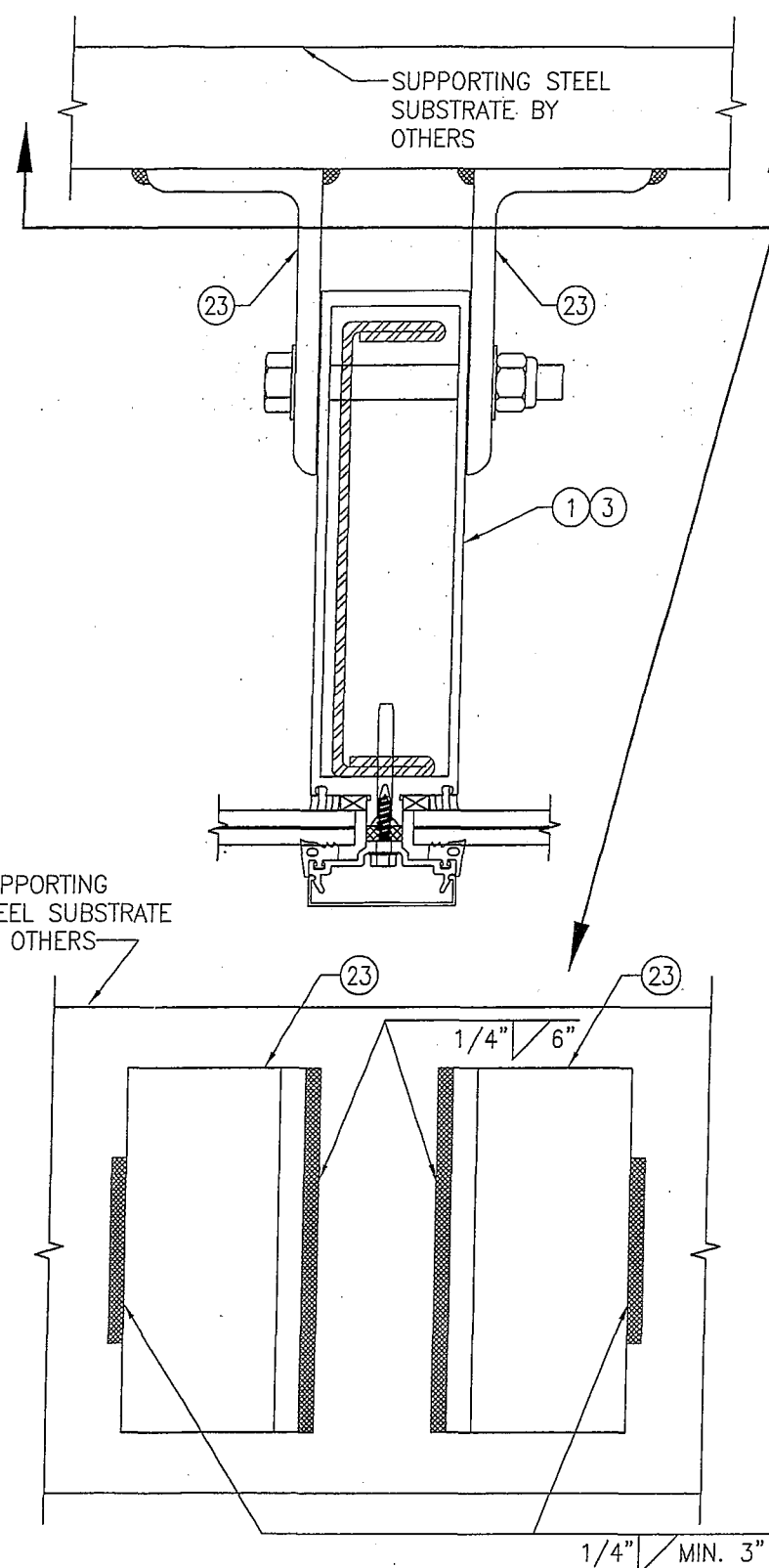
1. SEE ELEVATION FOR DIMENSIONING OF LOAD WIDTH.
2. PRESSURES SHOWN ARE SPECIFIC TO EACH INDIVIDUAL MULLION SUPPORT AREA. ALLOWABLE PRESSURE MAY VARY FROM BAY TO BAY AS DICTATED BY EACH INDIVIDUAL MULLION CONDITION.
3. LESSER OF PRESSURES STATED IN THIS TABLE & THE ALLOWABLE GLASS PRESSURE, AS SHOWN ON SHEET 1, SHALL CONTROL AS ALLOWABLE FOR THE WALL ASSEMBLY.
4. AT SPAN OF 132" & LESS, LOAD WIDTH CONTROLS THE ALLOWABLE PRESSURE. THEREFORE, IT SHALL NOT BE ASSUMED THAT INTERPRETATION OF PRESSURE VALUES CAN BE DONE WITH SPANS UNDER 132". INTERPRETATION OF PRESSURE VALUES BETWEEN THOSE SHOWN MAY APPLY.

DRAWN BY: W.W.S.		CHECKED BY: W.W.S.	
PLOT: 1=48		DATE: 03/16/13	
DATE	BY	REVISION	DESCRIPTION
NO. 1			
JOB INFORMATION:			
KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555			
CONSULTANTS: W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) 7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424			
DRAWING TITLE: 10 13/16" DEEP 1600 SYSTEM 1 CURTAIN WALL (L.M.I.)			
STATE OF TEXAS WARREN W. SCHAEFER 113497 LICENSED PROFESSIONAL ENGINEER			
MAR 20 2013			
WARREN W. SCHAEFER, P.E. P.E. NO. 113497			
DRAWING NO. 1794T		REV.	
SHEET NO. 3		OF 12	



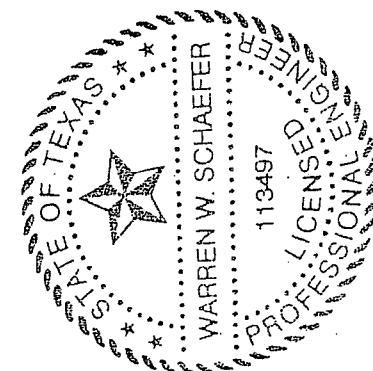
NOTE: ALL 1/2" BOLTS CONNECTING ANGLES TO MULLIONS SHALL BE GRADE 5 STEEL OR 300 SERIES STAINLESS STEEL.

SUPPORTING STEEL SUBSTRATE BY OTHERS

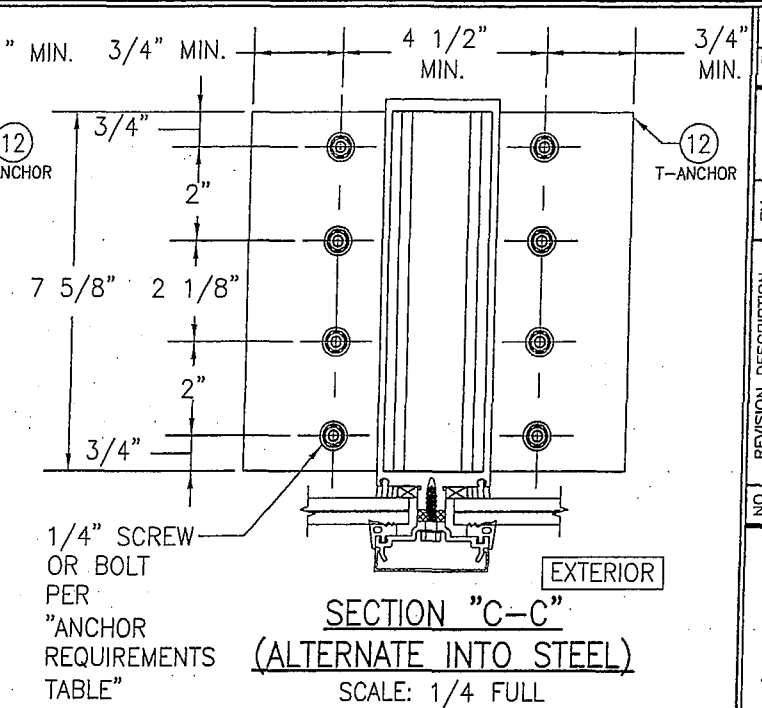
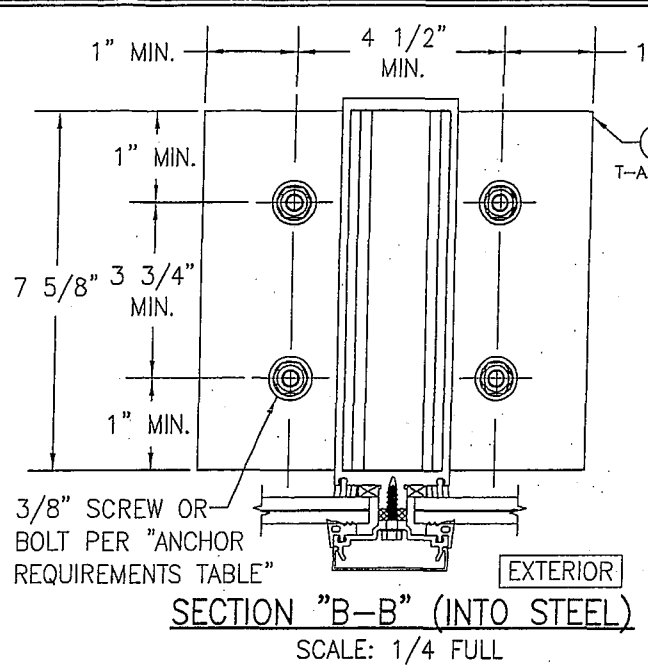
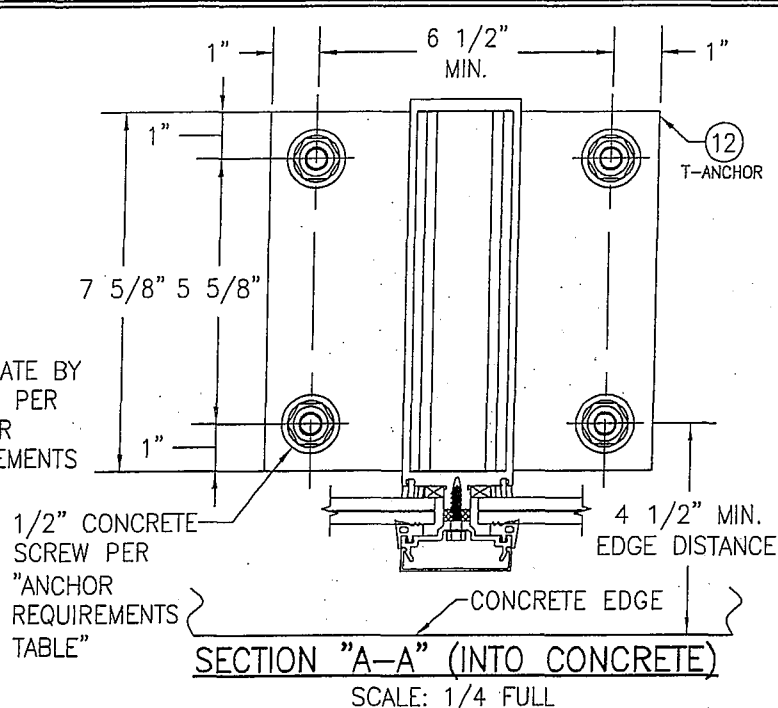
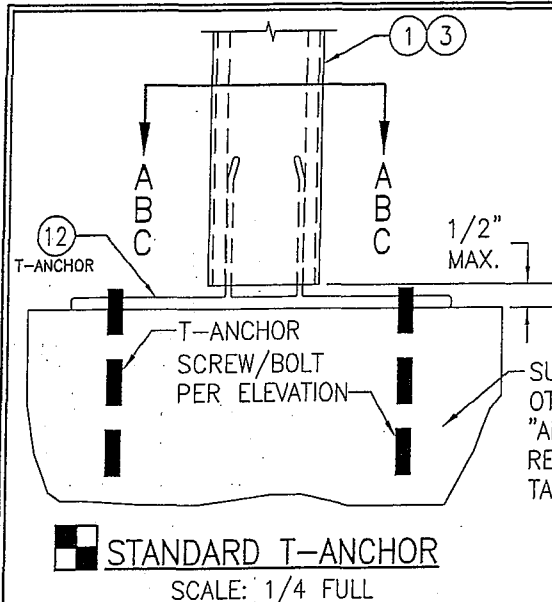


ALTERNATE WELD DETAIL FOR WIND LOAD ANCHORS

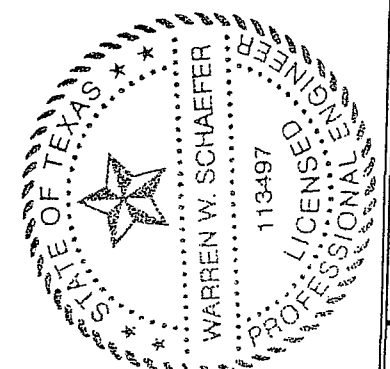
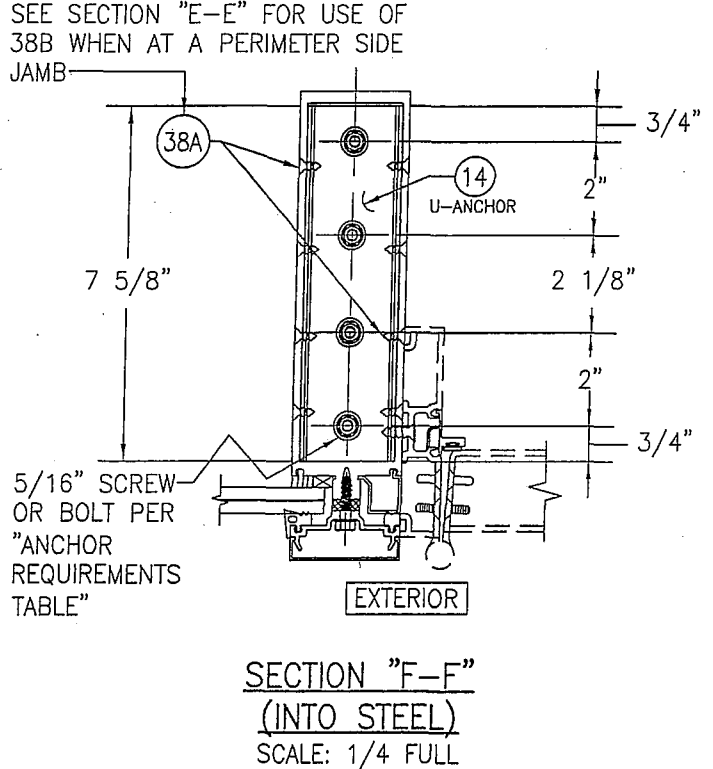
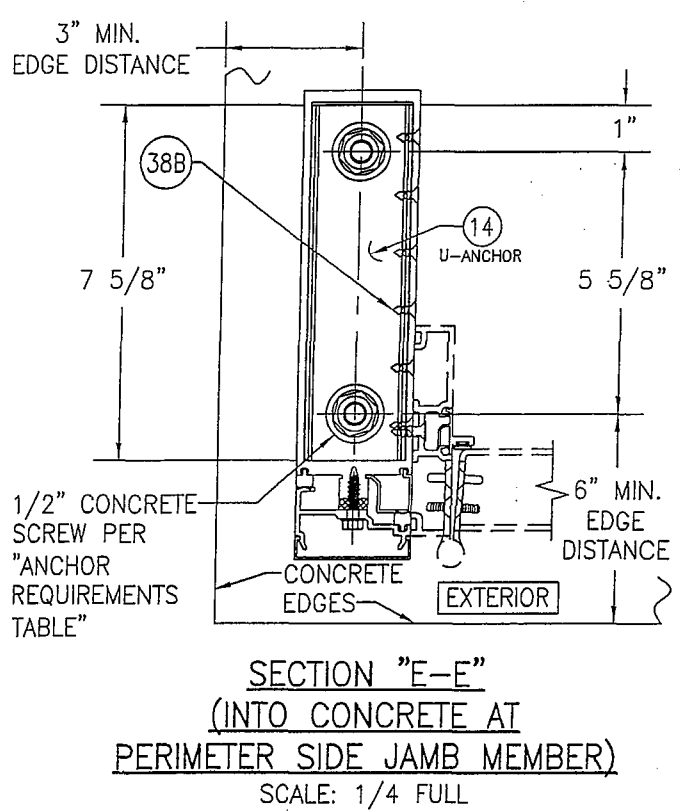
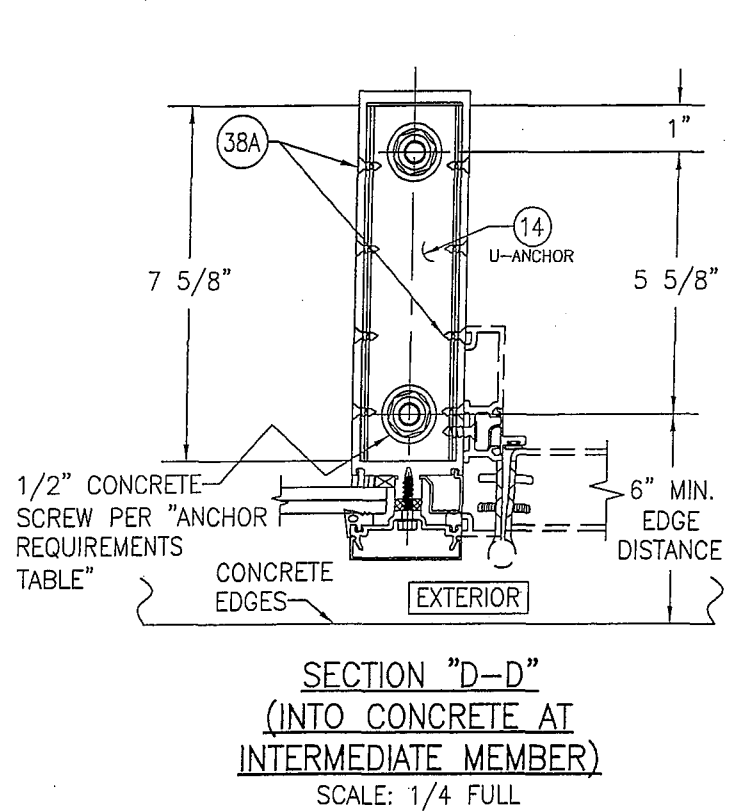
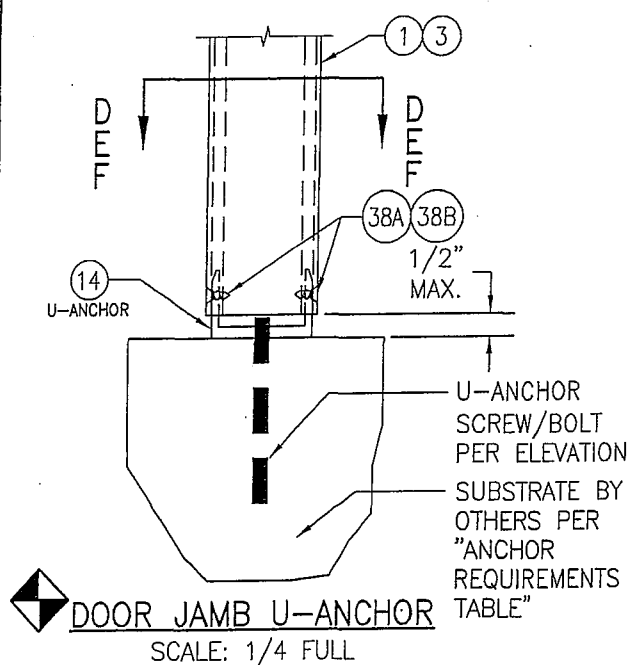
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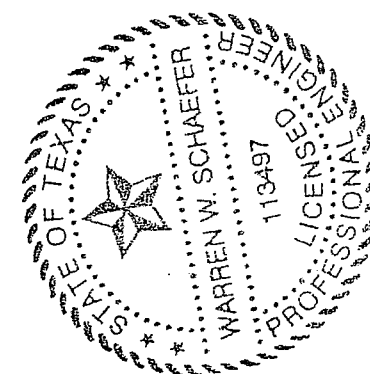
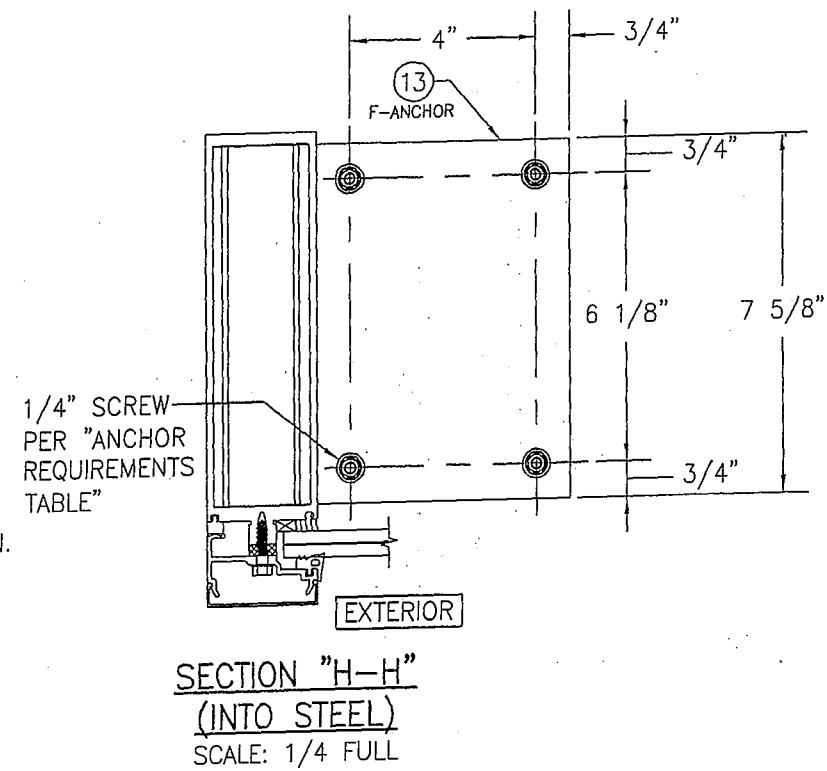
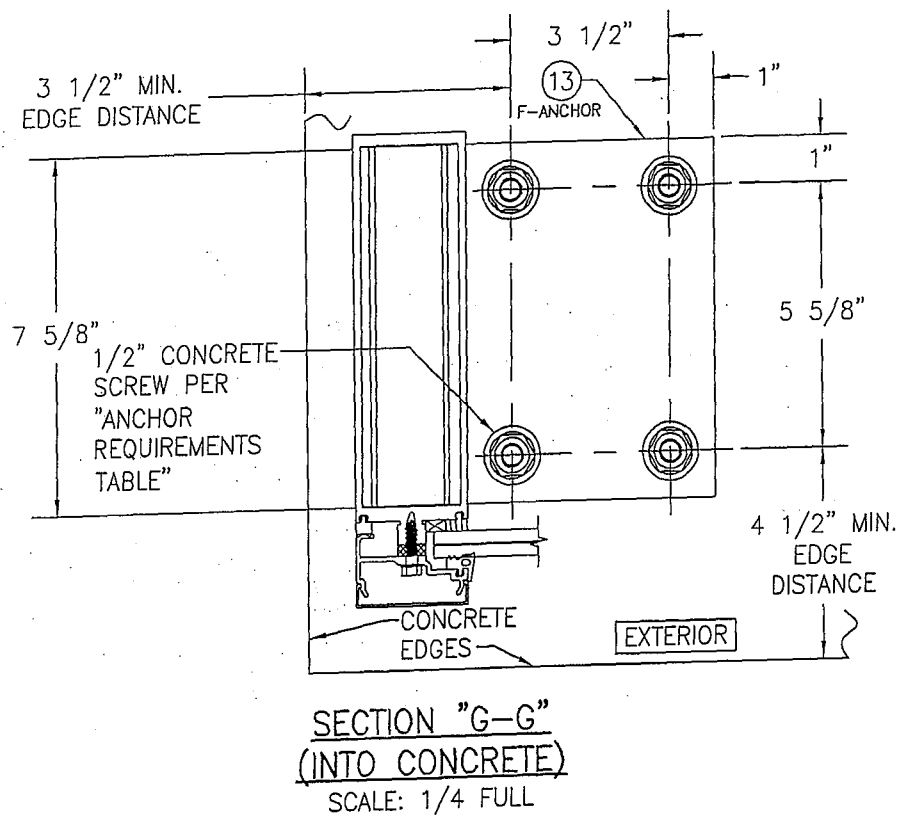
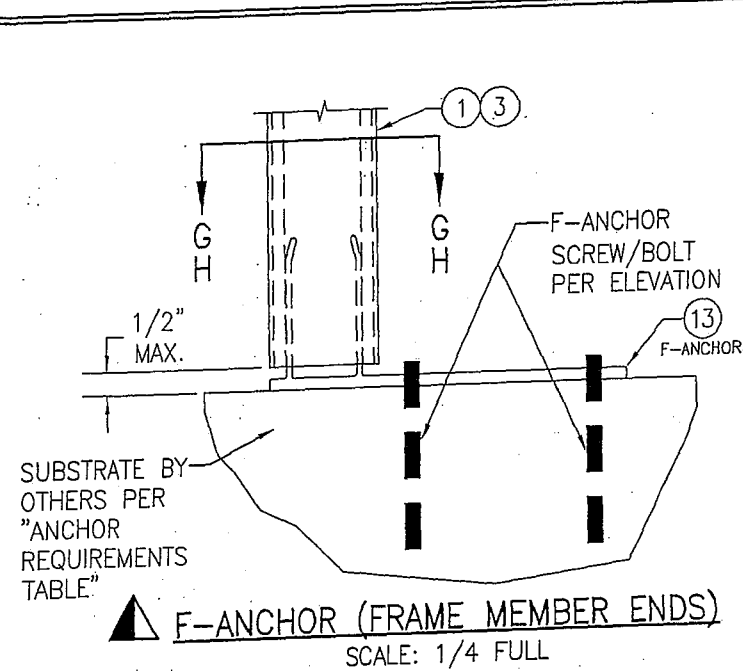
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PLOT: 1=3		DATE: 03/19/13	
NO.	REVISION	DESCRIPTION	DATE
1			
DRAWING TITLE 10 13/16" DEEP 1600 SYSTEM 1 CURTAIN WALL (L.M.I.)			
CONSULTANTS W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980)		JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIDGE COURT NORCROSS, GA 30092 770-449-5555	
7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424		CERTIFICATION MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497	
DRAWING NO. 1794T		REV.	
SHEET NO. 4		OF 12	



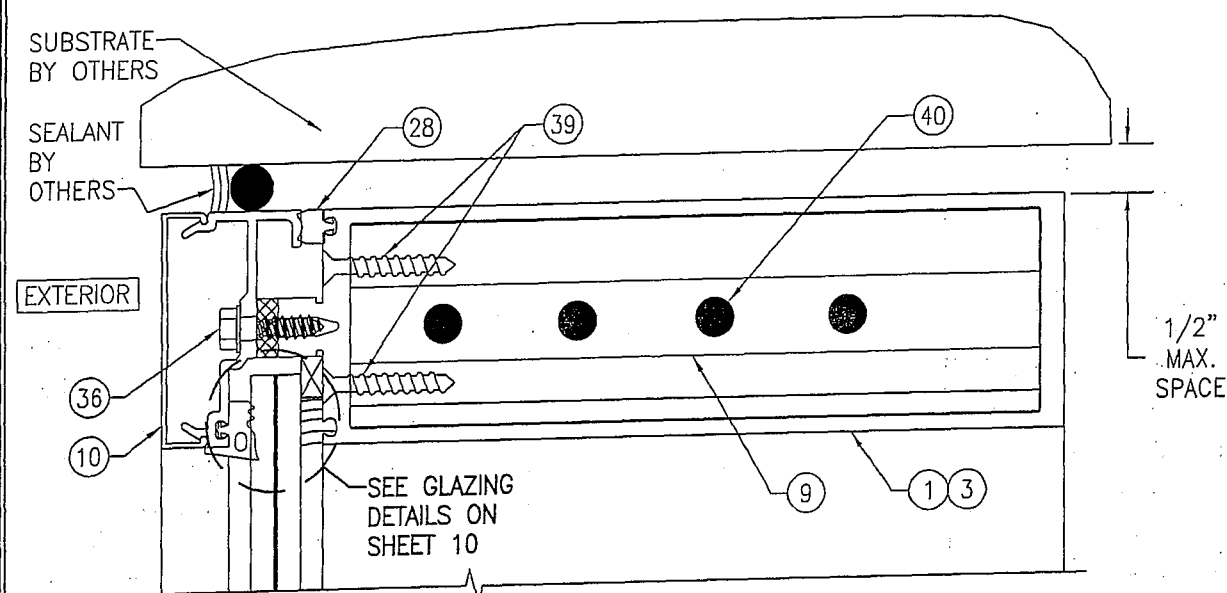
SEE SECTION "E-E" FOR USE OF 38B WHEN AT A PERIMETER SIDE JAMB



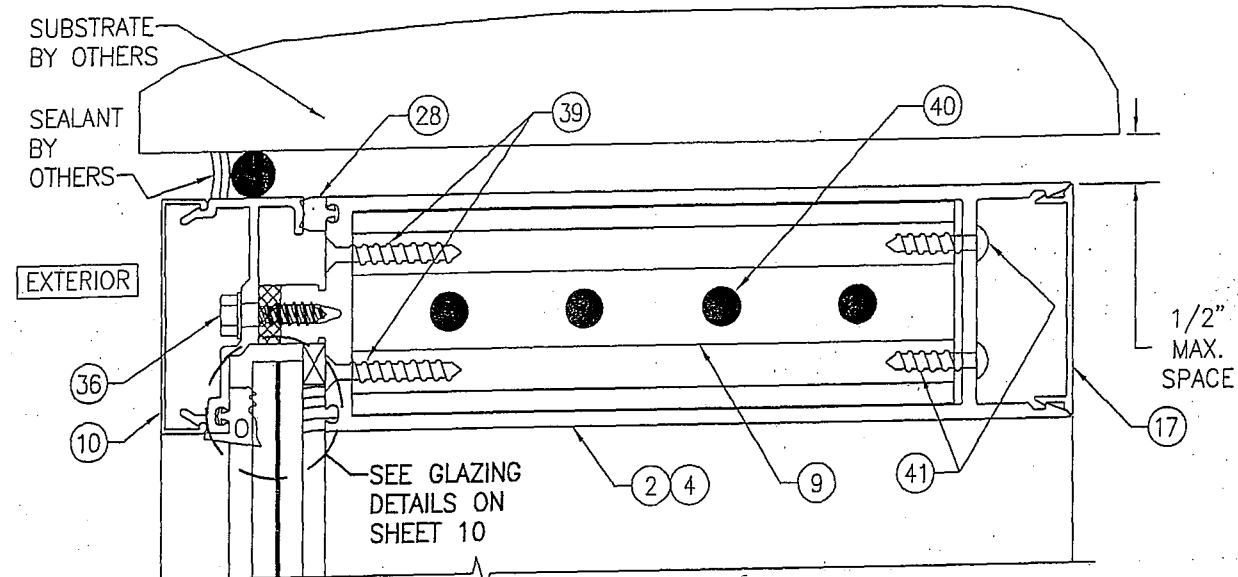
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PLOT: 1-4		DATE: 03/19/13	
NO.	REVISION	DESCRIPTION	DATE
DRAWING TITLE: 10 13/16" DEEP 1600 SYSTEM 1 CURTAIN WALL (L.M.I.) CONSULTANTS: W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) 7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424 JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555			
CERTIFICATION MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497		DRAWING NO. 1794T SHEET NO. 5 OF 12	



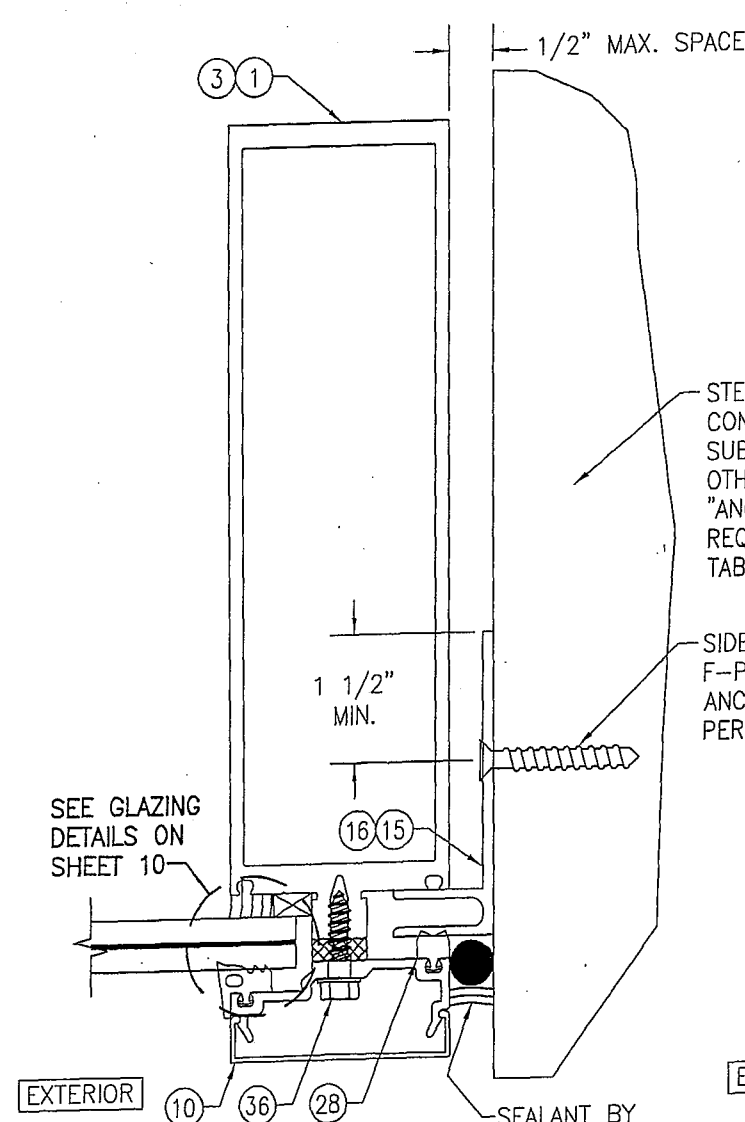
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PLOT: 1=4		DATE: 03/19/13	
NO.	REVISION	DESCRIPTION	DATE
DRAWING TITLE 10 13/16" DEEP 1600 SYSTEM 1 CURTAIN WALL (L.M.I.)			
CONSULTANTS W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980)		JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555	
CERTIFICATION MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497		DRAWING NO. 1794T	
SHEET NO. 6 OF 12		REV.	



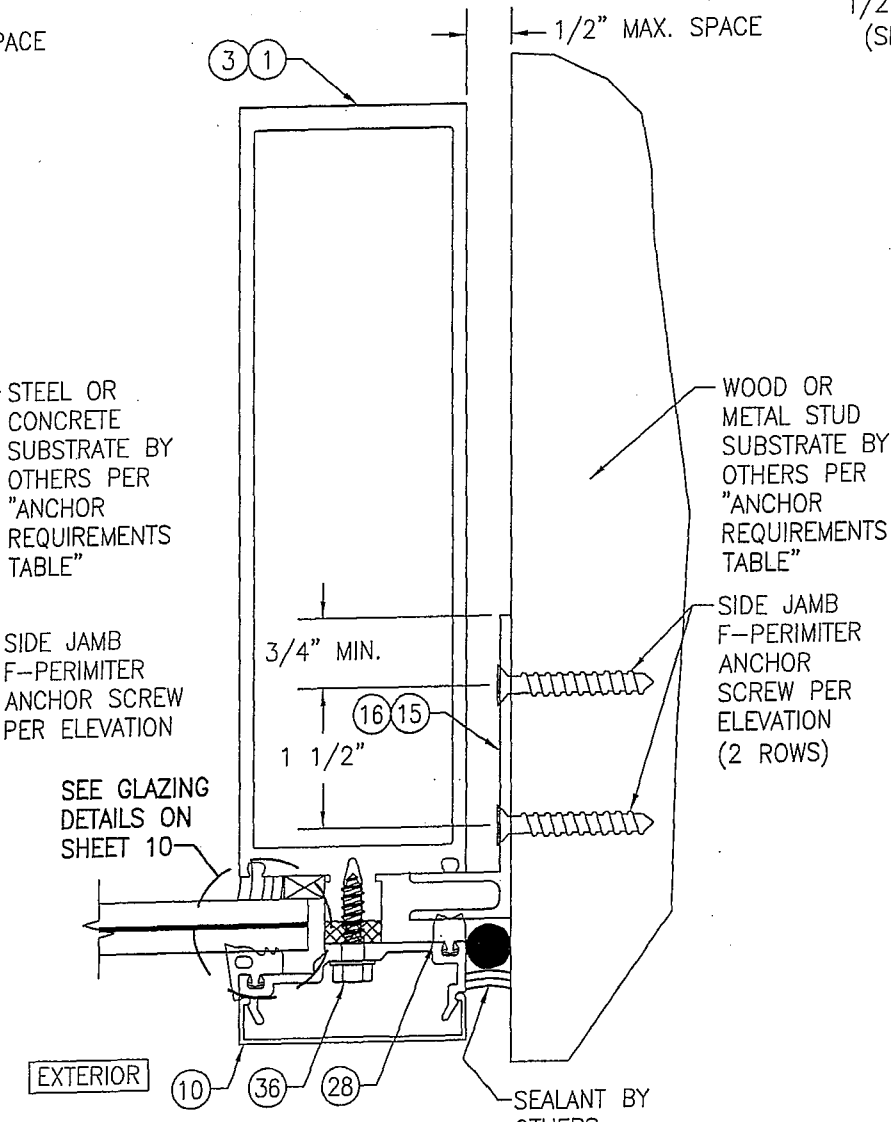
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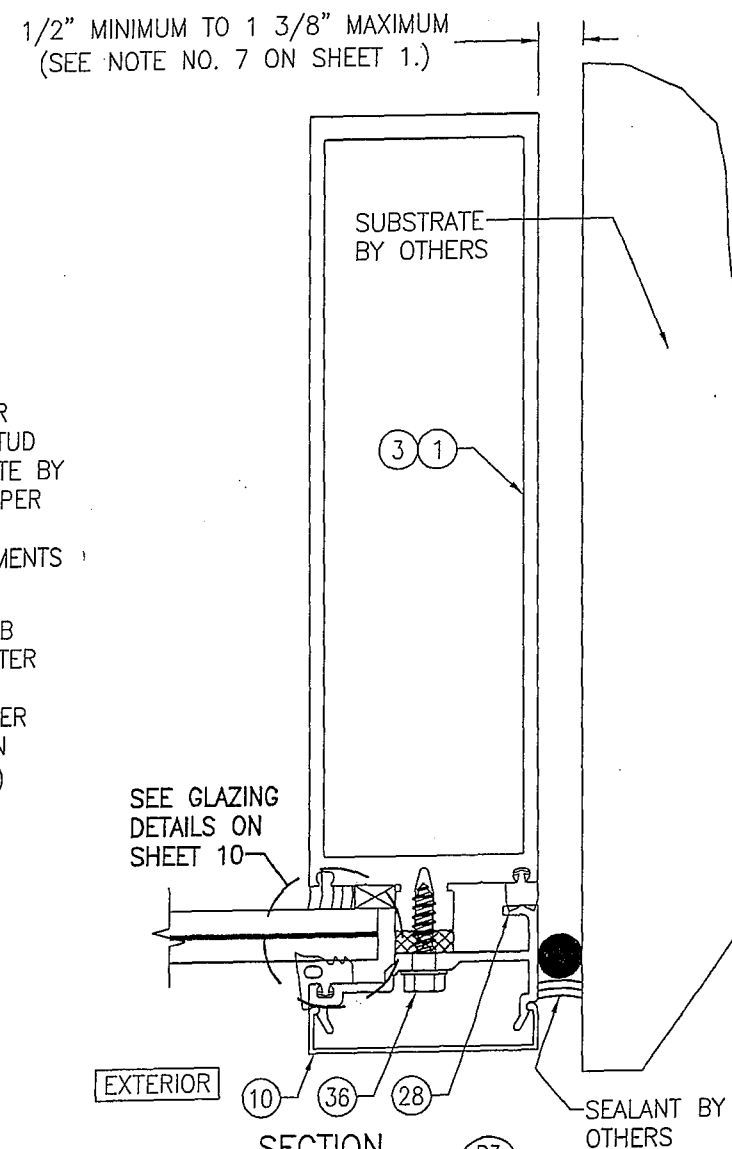
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SCALE: 1/2 FULL



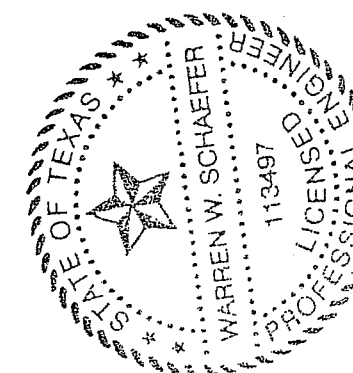
SECTION B1
SCALE: 1/2 FULL
(SIDE JAMB F-ANCHOR TO STEEL AND CONCRETE)



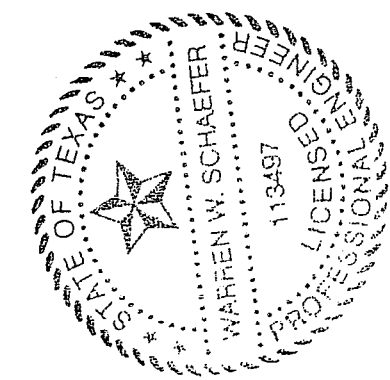
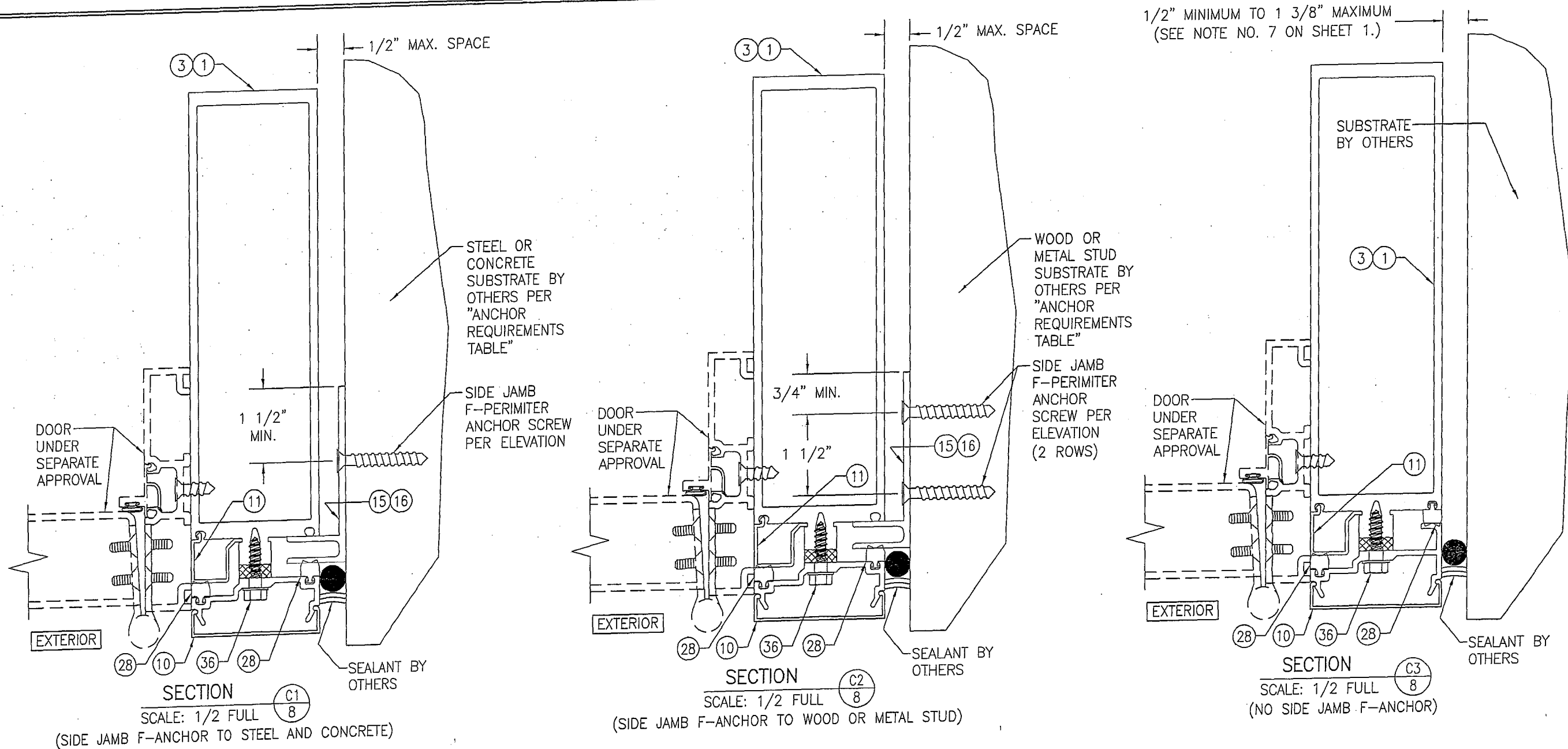
SECTION B2
SCALE: 1/2 FULL
(SIDE JAMB F-ANCHOR TO WOOD OR METAL STUD)



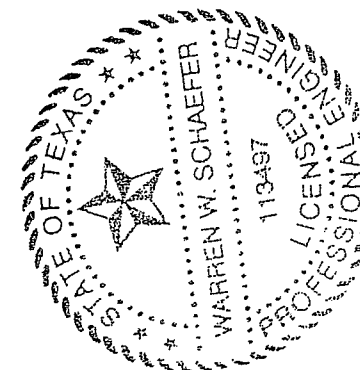
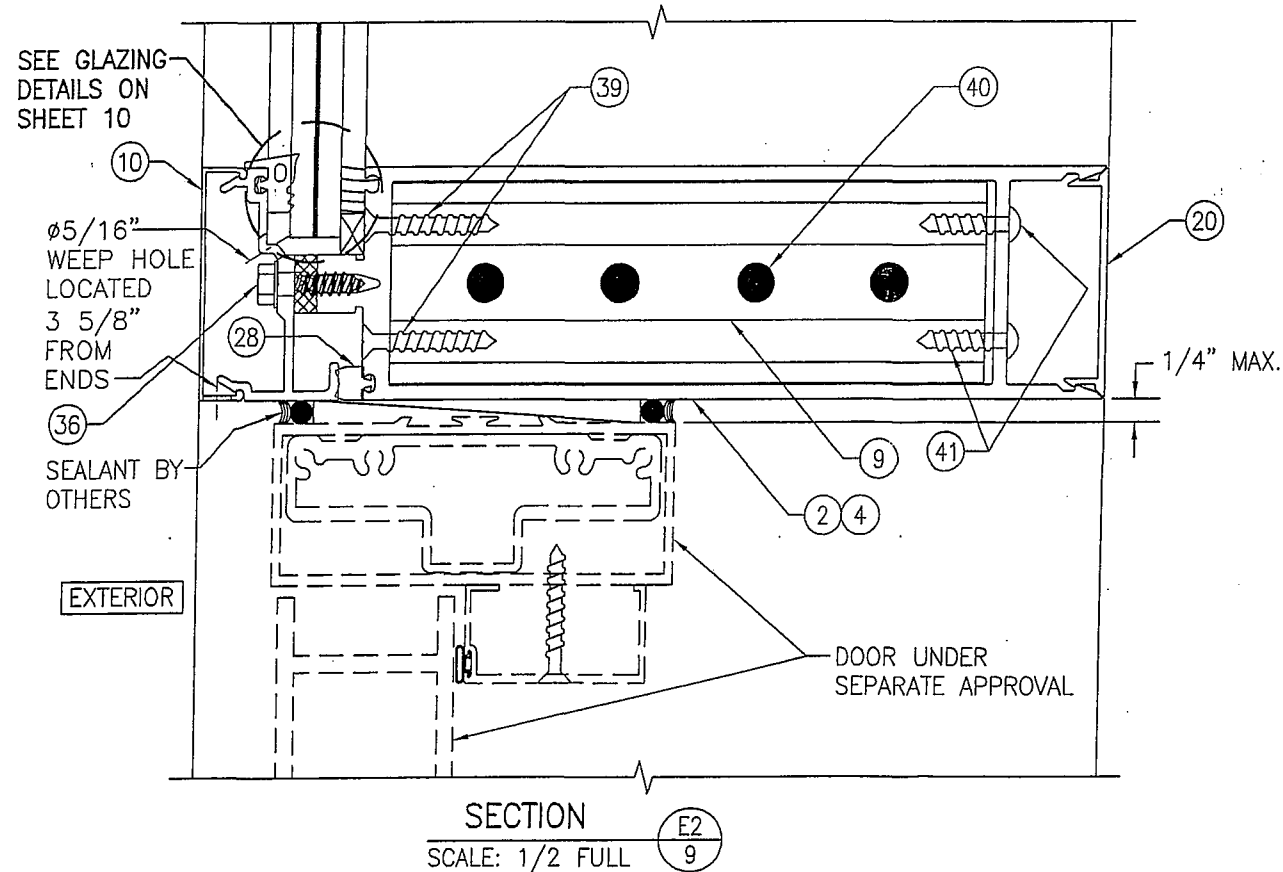
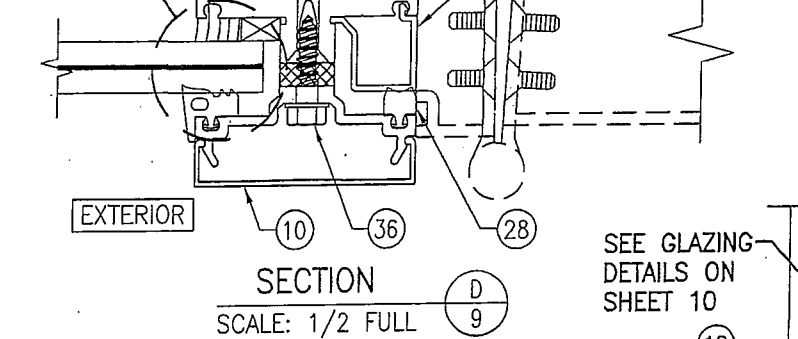
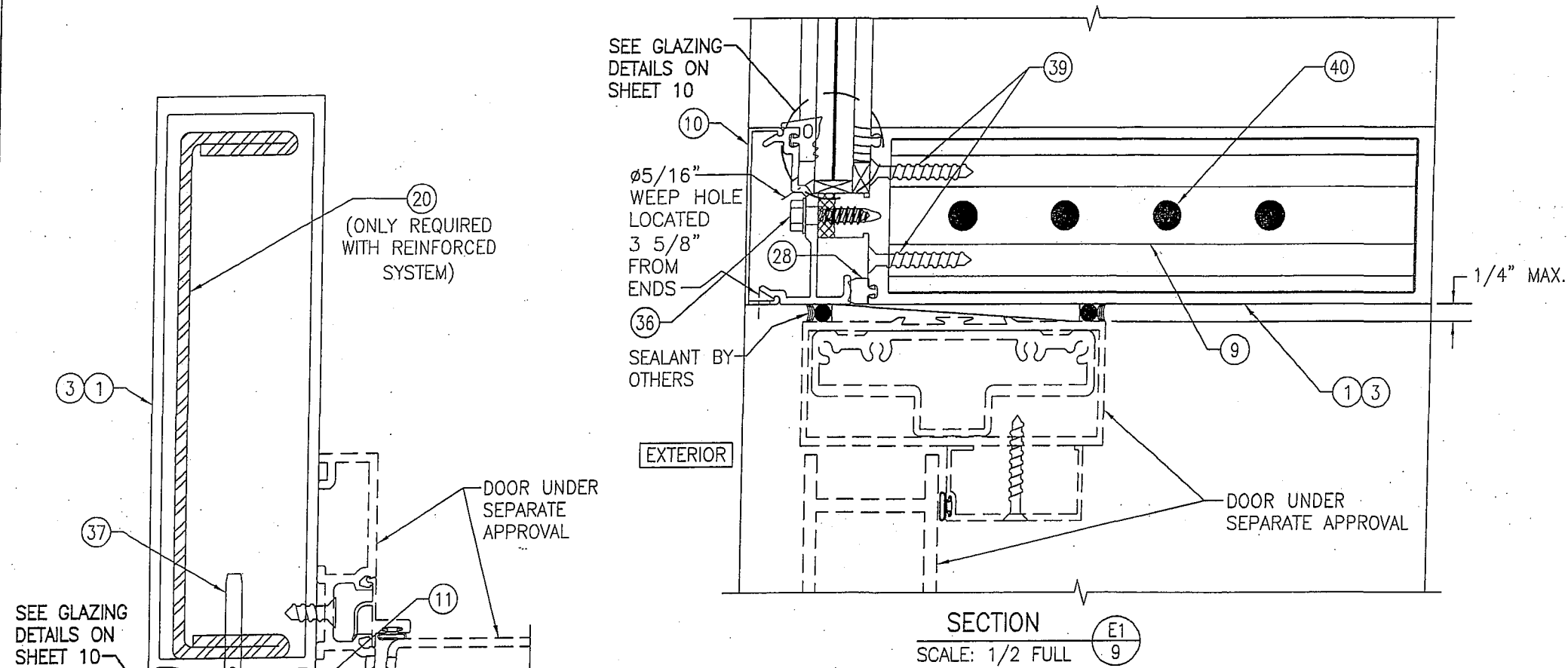
SECTION B3
SCALE: 1/2 FULL
(NO SIDE JAMB F-ANCHOR)



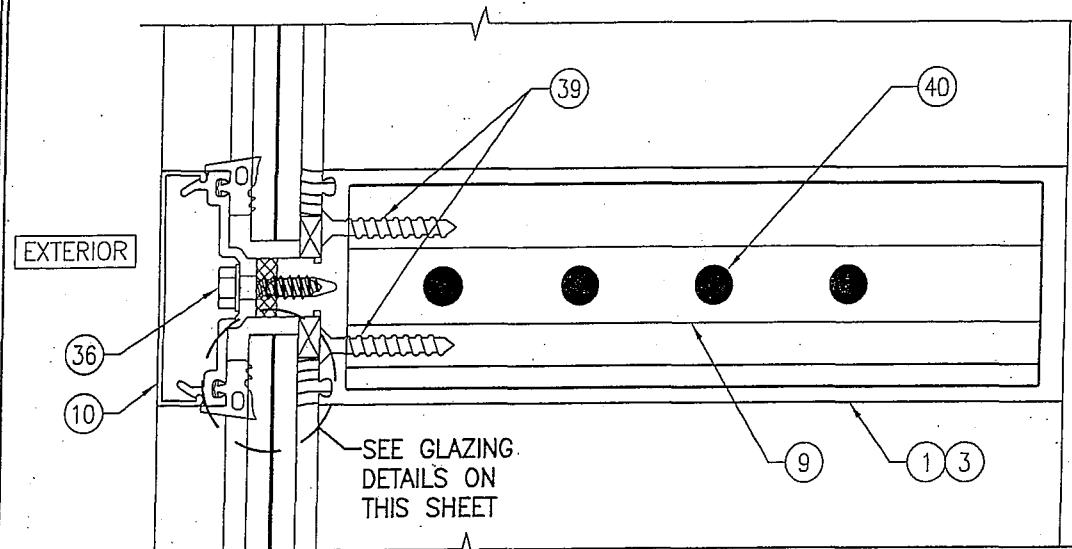
DRAWN BY: W.W.S.	CHECKED BY: W.W.S.
PLOT: 1-2	DATE: 03/19/13
NO.	REVISION DESCRIPTION
DATE	BY
DRAWING TITLE 10 13/16" DEEP 1600 SYSTEM 1 CURTAIN WALL (L.M.I.)	
CONSULTANTS W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) 7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424	
JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIDGE COURT NORCROSS, GA 30092 770-449-5555	
CERTIFICATION MAR 20 2013	DRAWING NO. 1794T
WARREN W. SCHAEFER, P.E. P.E. NO. 113497	REV. SHEET NO. 7 OF 12



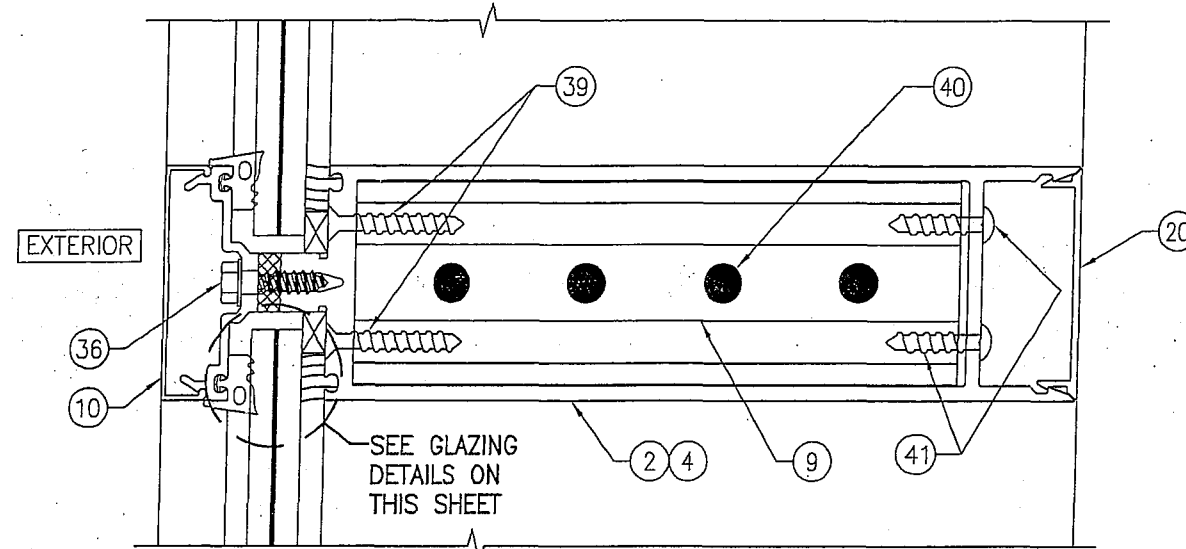
DRAWING TITLE		DRAWN BY: W.W.S.		CHECKED BY: W.W.S.	
10 13/16" DEEP 1600 SYSTEM 1 CURTAIN WALL (L.M.I.)		PLOT: 1=2		DATE: 03/19/13	
CONSULTANTS		NO.	REVISION	DESCRIPTION	BY
W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980)					
7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424					
JOB INFORMATION:					
KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555					
CERTIFICATION	MAR 20 2013	DRAWING NO.	1794T	REV.	
		SHEET NO.	8	OF	12



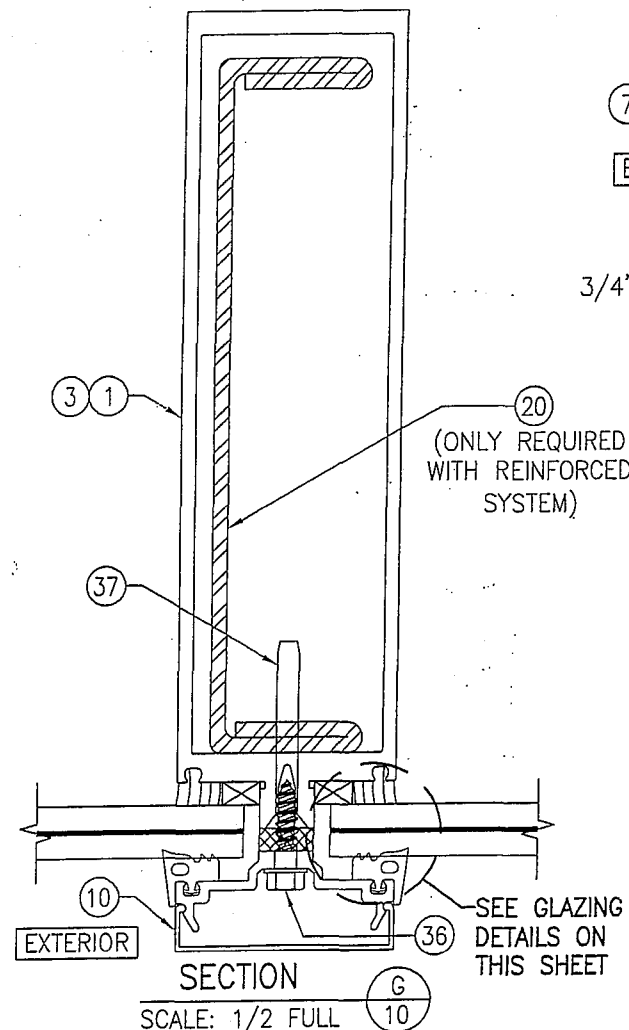
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CERTIFICATION MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497		DRAWING NO. 1794T	
SHEET NO. 9 OF 12		REV.	



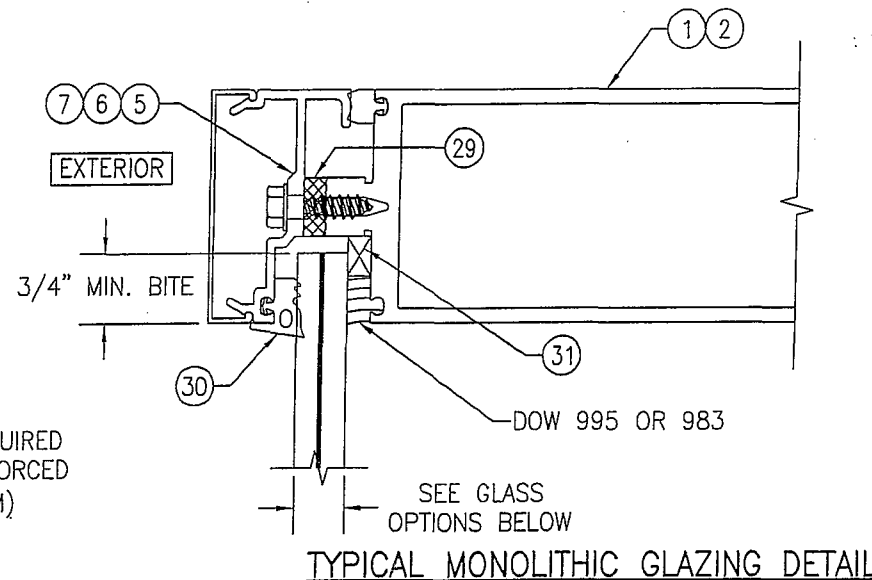
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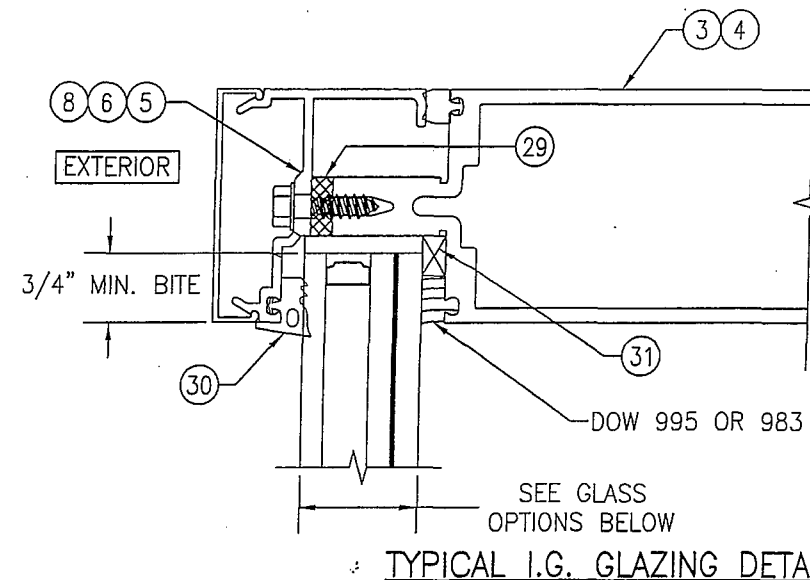
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SECTION G
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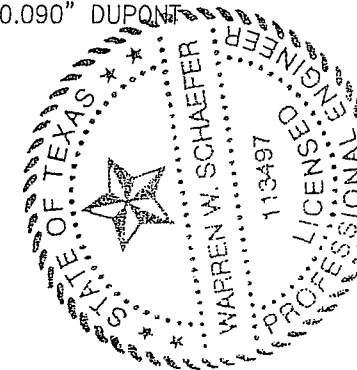


- GLASS OPTIONS:**
 OPTION 1: 5/8" THICK LAMINATED VIRACON HRG-2 GLASS (1/4" HT. ST./0.050" URETHANE/0.080" POLYCARBONATE/0.050" URETHANE/1/4" HT. ST.)
 OPTION 2: 9/16" THICK LAMINATED GLASS (1/4" HT. ST./0.100" SOLUTIA SAFLEX HP/1/4" HT. ST.)
 OPTION 3: 9/16" THICK LAMINATED GLASS (1/4" HT. ST./0.090" DUPONT SG/1/4" HT. ST.)
 OPTION 4: 9/16" THICK LAMINATED GLASS (1/4" HT. ST./0.090" SOLUTIA SAFLEX/1/4" HT. ST.)
 OPTION 5: 9/16" THICK LAMINATED GLASS (1/4" HT. ST./0.090" DUPONT BUTACITE PVB/1/4" HT. ST.)

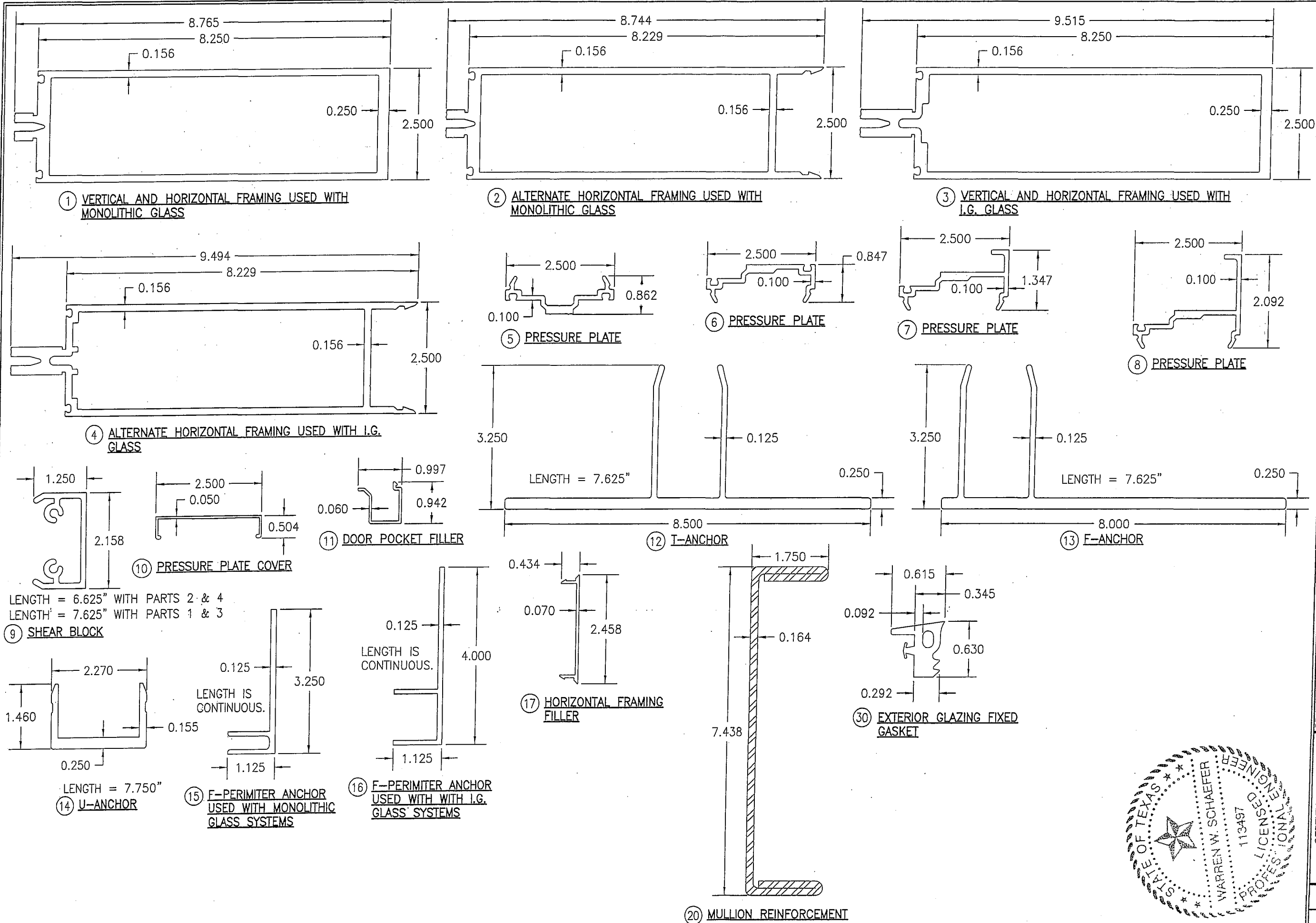


- GLASS OPTIONS:**
 OPTION 6: 1 5/16" THICK I.G. LAMINATED GLASS (1/4" HT. ST. OR TEMPERED EXTERIOR; 1/2" AIR SPACE; 1/4" HT. ST./0.090" SOLUTIA SAFLEX/1/4" HT. ST. INTERIOR)
 OPTION 7: 1 5/16" THICK I.G. LAMINATED GLASS (1/4" HT. ST. OR TEMPERED EXTERIOR; 1/2" AIR SPACE; 1/4" HT. ST./0.090" DUPONT BUTACITE PVB/1/4" HT. ST. INTERIOR)
 OPTION 8: 1 5/16" THICK I.G. LAMINATED GLASS (1/4" HT. ST. OR TEMPERED EXTERIOR; 1/2" AIR SPACE; 1/4" HT. ST./0.090" DUPONT SG/1/4" HT. ST. INTERIOR)

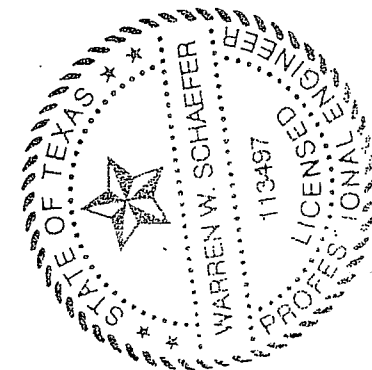
NOTE: EXTERIOR GLASS PANE OF I.G. GLAZING SHALL BE TEMPERED WHEN CURTAIN WALL GLASS IS INSTALLED IN A SMALL MISSILE IMPACT LOCATION OF A BUILDING OR WHEN GLASS IS REQUIRED TO BE SAFETY GLAZED.



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CONSULTANTS: W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980)		JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIDGE COURT NORCROSS, GA 30092 770-449-5555	
7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424		WARREN W. SCHAEFER, P.E. P.E. NO. 113497	
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CERTIFICATION MAR 20 2013 WARREN W. SCHAEFER, P.E. P.E. NO. 113497			
DRAWING NO. 1794T		REV.	
SHEET NO. 11 OF 12			



GENERAL NOTES:

1. THESE CURTAIN WALL SYSTEMS HAVE BEEN TESTED, ANALYZED & APPROVED FOR DESIGN PRESSURES NOT TO EXCEED THOSE SHOWN IN THE "ALLOWABLE DESIGN PRESSURE TABLE(S)".
2. OPENINGS, BUCKING & BUCKING FASTENERS MUST BE PROPERLY DESIGNED & INSTALLED TO TRANSFER WIND LOADS TO THE STRUCTURE.
3. ALL HARDWARE & FASTENERS SHALL BE IN ACCORDANCE WITH THESE DRAWINGS & SHALL NOT VARY UNLESS SPECIFICALLY MENTIONED ON THE DRAWINGS. SPECIFIED ANCHOR EMBED TO BASE MATERIAL SHALL BE BEYOND WALL FINISH OR STUCCO.
4. THE DETAILS & SPECIFICATIONS SHOWN HEREIN REPRESENT THE PRODUCTS TESTED & PROPOSED FOR WATER, AIR, IMPACT, CYCLIC & UNIFORM STATIC AIR PRESSURE TESTING IN CONFORMANCE WITH ASTM E330, E283, E331, E1886 & E1996 FOR SMALL MISSILE IMPACT CURTAIN WALL SYSTEMS.
5. THESE CURTAIN WALL SYSTEMS HAVE BEEN DESIGNED IN ACCORDANCE WITH AND MEET THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (IBC).
6. THIS CURTAIN WALL SYSTEM MAY NOT BE INSTALLED AT ELEVATIONS BELOW 30 FT. ABOVE GRADE WITHOUT AN APPROVED SHUTTER.
7. ALL ANCHORS SECURING CURTAIN WALL FRAME TO PRESSURE TREATED BUCKS OR WOOD FRAMING SHALL BE CAPABLE OF RESISTING CORROSION CAUSED BY THE PRESSURE TREATING CHEMICALS IN THE WOOD.
8. DETERMINE THE POSITIVE & NEGATIVE DESIGN LOADS TO USE WHEN REFERENCING THESE DOCUMENTS IN ACCORDANCE WITH THE GOVERNING CODE AND GOVERNING WIND VELOCITY. FOR WIND LOAD CALCULATIONS IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, A DIRECTIONALITY FACTOR OF $KD = 0.85$ MAY BE APPLIED PER THE ASCE-7 STANDARD.
9. NO INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE CERTIFICATION OF THIS PRODUCT. WIND LOAD DURATION FACTOR $CD = 1.6$ WAS USED FOR WOOD SCREW ANALYSIS ONLY.
10. MATERIALS, INCLUDING BUT NOT LIMITED TO STEEL SCREWS, THAT COME INTO CONTACT WITH OTHER DISSIMILAR MATERIALS SHALL BE SEPARATED OR COATED AS REQUIRED TO AVOID CORROSION OF EITHER MATERIAL.
11. THERE SHALL BE NO LIMIT TO THE NUMBER OF HORIZONTAL & VERTICAL PANELS USED FOR ANY JOB PROVIDING ALL RESTRICTIONS ARE MET PER THE ELEVATIONS.
12. TO THE BEST OF OUR KNOWLEDGE, THE CURTAIN WALL SYSTEMS SHOWN HEREIN ARE QUALITY ASSURED BY AN APPROVED CERTIFICATION/QA ENTITY & SHALL BE LABELED IN ACCORDANCE WITH APPLICABLE STANDARDS. THESE DRAWINGS SHOW ALL APPLICABLE ELEVATION, COMBINATION, INSTALLATION & COMPARATIVE ANALYSIS CONDITIONS AS DETERMINED THROUGH TESTING & ENGINEERING RATIONAL ANALYSIS. CURTAIN WALL ASSEMBLY SHALL BE IN ACCORDANCE WITH THESE DRAWINGS, THE MANUFACTURER'S QUALITY ASSURANCE SPECIFICATIONS & TESTING REPORTS.
13. CERTIFICATION OF THESE CURTAIN WALL SYSTEMS SHALL BE CONSIDERED VOID IF THEY ARE INSTALLED WITHOUT A BUILDING PERMIT FROM THE APPLICABLE LOCAL BUILDING DEPARTMENT OR IF THEY ARE INSTALLED BY ANYONE OTHER THAN A LICENSED CONTRACTOR EXPERIENCED WITH CURTAIN WALL INSTALLATIONS.

ANCHOR REQUIREMENTS TABLE
(SINGLE SPAN REINFORCED & NON-REINFORCED CURTAIN WALL)

OPENING TYPE (SUBSTRATE)	FRAME/CLIP TO OPENING FASTENER TYPE	MINIMUM EMBED	MINIMUM EDGE DIST.
F-PERIMETER ANCHOR SCREWS			
MIN. 16 GA. 50 KSI METAL STUD	1/4-14 GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
MIN. 2X6 WOOD FRAME OR BUCK (MIN. GR. 2 & $G=0.55$)	1/4" DIA. GR. 5 COARSE THREAD SCREW	1 1/4"	3/4"
MIN. 1/8" THK A36 STEEL	1/4-14 OR 20 GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
MIN. 3000 PSI CONCRETE	(1) 3/8" CONCRETE SCREW ANCHOR	2 1/2"	2 1/2"
T, F & U-ANCHOR SCREWS/BOLTS (VERTICAL MEMBER ENDS)			
MIN. 1/4" THK A36 STEEL	3/8"-16 430 SS HCMS OR GR. 5 CS THREAD FORMING SCREW	FULL	3/4"
	3/8" GR. 5 CS OR 410 SS BOLT WITH LOCK WASHER & NUT	FULL	3/4"
	1/4-14 OR 20 GR. 5 SELF TAP/DRILL SCREW	FULL	1/2"
	1/4" GR. 5 CS OR 410 SS BOLT WITH LOCK WASHER & NUT	FULL	1/2"
	5/16-24 GR. 5 SELF TAP/DRILL SCREW	FULL	5/8"
	5/16" GR. 5 CS OR 410 SS BOLT WITH LOCK WASHER & NUT	FULL	5/8"
(2) MIN. 3000 PSI CONCRETE	(1) 1/2" CONCRETE SCREW ANCHOR	3 1/4"	SEE DETAILS

- (1) 1/2" CONCRETE SCREWS SHALL BE SIMPSON STRONG-TIE TITAN HD SCREW ANCHOR (GALVANIZED STEEL).
- (2) MINIMUM CONCRETE SLAB THICKNESS FOR PLACEMENT OF "T", "F" & "U" ANCHORS IS 6 3/4".

CORNER CONSTRUCTION:

ONE-PIECE VERTICAL AND HORIZONTAL FRAMING AND INTERMEDIATES: VERTICAL MEMBERS RUN THROUGH WHILE THE HORIZONTAL MEMBERS ARE SQUARE CUT, BUTTED AND MECHANICALLY FASTENED TO THE VERTICAL MEMBERS VIA A SHEAR BLOCK (ITEM #9). THE SHEAR BLOCK IS MECHANICALLY FASTENED TO THE VERTICAL FRAME MEMBER WITH 4 NO. 12 X 7/16" PHTF SCREWS. THE HORIZONTAL FRAME MEMBERS ARE ATTACHED TO THE SHEAR BLOCK WITH 2 NO. 12 X 1 1/2" FHTF SCREWS. CORNERS ARE SEALED WITH DOW 795 SILICONE SEALANT.

TWO-PIECE VERTICAL AND HORIZONTAL FRAMING AND INTERMEDIATES: VERTICAL MEMBERS RUN THROUGH WHILE THE HORIZONTAL MEMBERS ARE SQUARE CUT, BUTTED AND MECHANICALLY FASTENED TO THE VERTICAL MEMBERS VIA A SHEAR BLOCK (ITEM #9). THE SHEAR BLOCK IS MECHANICALLY FASTENED TO THE VERTICAL FRAME MEMBER WITH 4 NO. 12 X 7/16" PHTF SCREWS & . THE HORIZONTAL FRAME MEMBERS ARE ATTACHED TO THE SHEAR BLOCK WITH 2 FH & 2 PH NO. 12 X 1 1/2" FHTF SCREWS. CORNERS ARE SEALED WITH DOW 795 SILICONE SEALANT.

GLASS D.L.O. SIZE VS. PRESSURE

GLASS OPTIONS	MAXIMUM D.L.O. WIDTH	MAXIMUM D.L.O. HEIGHT	ALLOWABLE DESIGN PRESSURE
1, 2, 3 & 4	58 1/2"	82 1/8"	+/-90 PSF
	51 3/8"	93 1/2"	+/-90 PSF
	50 5/8"	94 3/4"	+/-90 PSF
	73 3/4"	54 5/8"	+/-90 PSF
1 & 2	58 1/2"	93 1/2"	+/-65 PSF
	57 3/4"	94 3/4"	+/-65 PSF
5 & 6	58 1/2"	93 1/2"	+/-90 PSF
	57 3/4"	94 3/4"	+/-90 PSF
	73 3/4"	54 5/8"	+/-90 PSF

SEE GLAZING DETAILS FOR GLASS OPTIONS

HEIGHT & WIDTH MAY NOT BE INTERCHANGED!

THESE DRAWINGS ARE APPLICABLE ONLY TO THE PRODUCT SPECIFIED. THEY MAY NOT BE USED FOR THE ASSEMBLY AND/OR INSTALLATION OF ANY OTHER PRODUCT NOR MAY THEY BE USED FOR RATIONAL AND/OR LOCAL APPROVAL OF ANY PRODUCT NOT PRODUCED BY THE MANUFACTURER STATED ON THESE DRAWINGS.

ANCHOR LEGEND

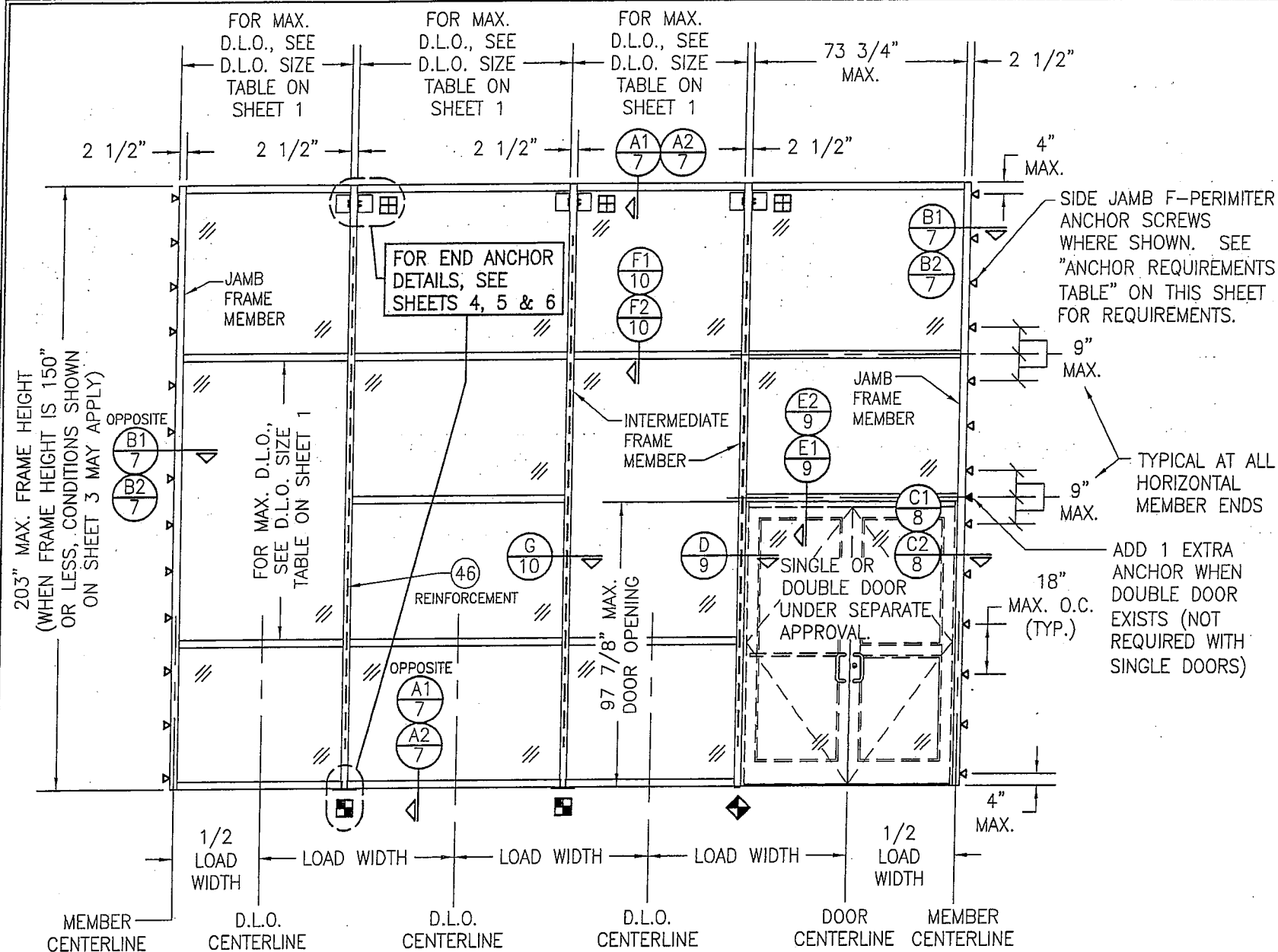
ANCHOR SYMBOL	ANCHOR DESCRIPTION
⊞	STANDARD WIND LOAD ANCHOR
⊞	STANDARD T-ANCHOR
⬠	DOOR JAMB U-ANCHOR
⚠	F-ANCHOR (FRAME MEMBER ENDS)

SEE SHEETS 4-6 FOR DETAILS OF ANCHORS

EVALUATION OF THIS PRODUCT IS BASED ON APPLICABLE STANDARDS AND/OR INFORMATION & RESULTS FROM APPLICABLE TEST REPORTS. THE BUILDING CODE VERSION CONSIDERED WITH THIS EVALUATION WAS THAT IN FORCE AT THE TIME OF THE EVALUATION. IN THE EVENT OF CODE VERSION CHANGES/UPDATES OR IN THE EVENT THAT NEW OR ADDITIONAL TESTING IS COMPLETED ON THIS PRODUCT, PRIOR TO STATING CODE COMPLIANCE, THE MANUFACTURER SHALL CONFIRM WITH THE EVALUATION ENGINEER OF RECORD THAT EVERYTHING SPECIFIED HERE-IN IS CURRENT WITH ALL CURRENT TESTING, CODES AND APPLICABLE STANDARDS.



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CONSULTANTS W. W. SCHAEFER ENGINEERING & CONSULTING, P.A. (REG. NO. F-14980) 7480 150TH COURT NORTH PALM BEACH GARDENS, FL 33418 PHONE: 561-744-3424	JOB INFORMATION: KAWNEER COMPANY, INC. 555 GUTHRIE COURT NORCROSS, GA 30092 770-449-5555
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DRAWING NO. 1795T	REV.
SHEET NO. 1 OF 12	



EXTERIOR ELEVATION:
SINGLE-SPAN REINFORCED CURTAIN WALL

SCALE: 1/4" = 1'-0"

NOTES APPLICABLE TO SINGLE-SPAN REINFORCED CURTAIN WALLS

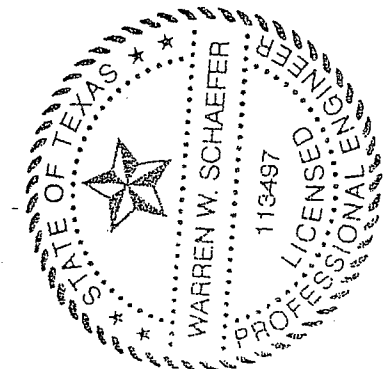
1. REINFORCEMENT SHALL RUN CONTINUOUS IN INTERMEDIATE VERTICAL MEMBERS & EXTEND TO WITHIN 17 1/2" OF THE ENDS.
2. THERE IS NO LIMIT TO THE NUMBER OF SECTIONS HORIZONTALLY PROVIDING THE OPENING IS DESIGNED TO SUPPORT THE LOADS TRANSFERRED FROM THE WALL SYSTEM.
3. THE SINGLE-SPAN ELEVATION SHOWN SHOWS ONE DOOR SECTION. MULTIPLE DOOR SECTIONS MAY OCCUR SIDE-BY SIDE IN ONE WALL SYSTEM PROVIDING ALL REQUIREMENTS WITHIN THIS DRAWING ARE MET & PROPER LOAD WIDTH (DISTANCE BETWEEN DOOR CENTERS) IS CONSIDERED WHEN DETERMINING ALLOWABLE DESIGN PRESSURE.
4. ALTHOUGH A DOOR SECTION IS SHOWN AT A SIDE JAMB, THAT SECTION MAY EXIST WITH OR WITHOUT A DOOR & THE DOOR MAY EXIST IN ANY BAY.
5. THE ELEVATION HERE-IN SHOWS T-ANCHORS AT THE BASE OF THE WALL ONLY. THESE ANCHORS MAY ALSO BE USED AT THE TOP OF A WALL IN LIEU OF THE WIND LOAD ANCHORS SHOWN PROVIDING THEY ARE INSTALLED THE SAME AS SHOWN AT THE BASE.
6. DOOR OPENINGS WIDER THAN THAT SHOWN ARE NOT PART OF THE SCOPE OF THIS APPROVAL. IF WIDER DOOR OPENINGS ARE REQUIRED, THEY SHALL BE EVALUATED & CERTIFIED UNDER SEPERATE JOB APPROVAL.

**ALLOWABLE DESIGN PRESSURE
(SINGLE SPAN REINFORCED
CURTAIN WALL)**

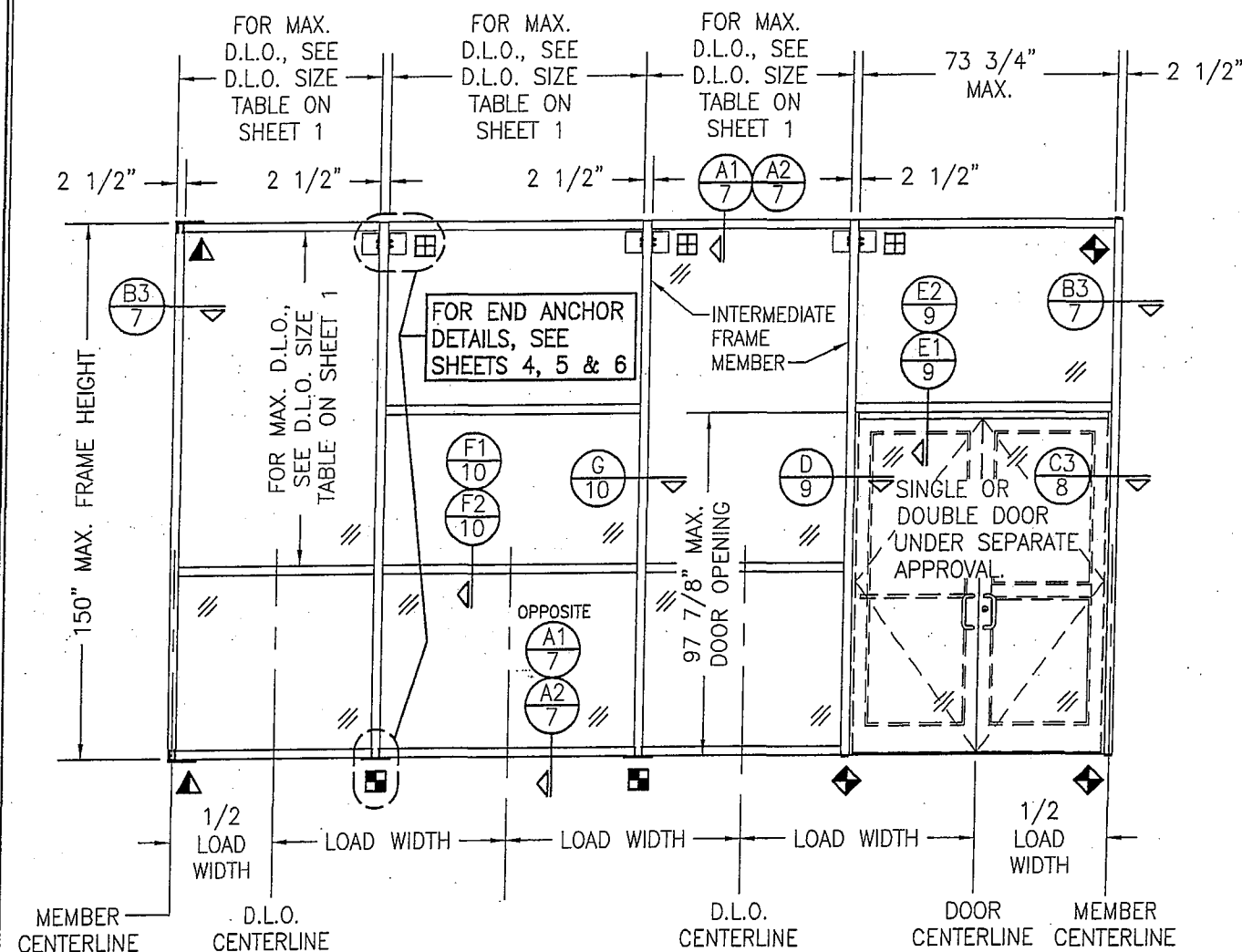
MAXIMUM MULLION SPAN (IN.)	MAXIMUM LOAD WIDTH (IN.)	ALLOWABLE PRESSURE (POS & NEG PSF)
203	76 1/4	81.0
	72	85.8
	68 5/8	90.0
	62	99.6
192	56	110.0
	76 1/4	85.6
	72	90.7
	68 5/8	95.2
180 & LESS	62	105.3
	59	110.0
	76 1/4	90.0
	72	95.3
	68 5/8	100.0
	62	110.0

NOTES:

1. SEE ELEVATION FOR DIMENSIONING OF LOAD WIDTH.
2. PRESSURES SHOWN ARE SPECIFIC TO EACH INDIVIDUAL MULLION SUPPORT AREA. ALLOWABLE PRESSURE MAY VARY FROM BAY TO BAY AS DICTATED BY EACH INDIVIDUAL MULLION CONDITION.
3. LESSER OF PRESSURES STATED IN THIS TABLE & THE ALLOWABLE GLASS PRESSURE, AS SHOWN ON SHEET 1, SHALL CONTROL AS ALLOWABLE FOR THE WALL ASSEMBLY.
4. AT SPAN OF 180" & LESS, LOAD WIDTH CONTROLS THE ALLOWABLE PRESSURE. THEREFORE, IT SHALL NOT BE ASSUMED THAT INTERPRETATION OF PRESSURE VALUES CAN BE DONE WITH SPANS UNDER 180". INTERPRETATION OF PRESSURE VALUES BETWEEN THOSE SHOWN MAY APPLY.



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EXTERIOR ELEVATION:
SINGLE-SPAN NON-REINFORCED CURTAIN WALL
SCALE: 1/4" = 1'-0"

NOTES APPLICABLE TO SINGLE-SPAN NON-REINFORCED CURTAIN WALLS

1. THE ELEVATION SHOWN ILLUSTRATES SIDE JAMB FRAME MEMBERS WITH FULL SPANS END SUPPORTED BY "F" OR "U" ANCHORS. IT IS OPTIONAL TO OMIT THE "F" & "U" ANCHORS AND INSTALL THE SIDE JAMB F-PERIMETER ANCHOR SCREWS AS SHOWN IN THE REINFORCED WALL ELEVATION ON SHEET 2.
2. THERE IS NO LIMIT TO THE NUMBER OF SECTIONS HORIZONTALLY PROVIDING THE OPENING IS DESIGNED TO SUPPORT THE LOADS TRANSFERRED FROM THE WALL SYSTEM.
3. THE SINGLE-SPAN ELEVATION SHOWN SHOWS ONE DOOR SECTION. MULTIPLE DOOR SECTIONS MAY OCCUR SIDE-BY-SIDE IN ONE WALL SYSTEM PROVIDING ALL REQUIREMENTS WITHIN THIS DRAWING ARE MET & PROPER LOAD WIDTH (DISTANCE BETWEEN DOOR CENTERS) IS CONSIDERED WHEN DETERMINING ALLOWABLE DESIGN PRESSURE.
4. ALTHOUGH A DOOR SECTION IS SHOWN AT A SIDE JAMB, THAT SECTION MAY EXIST WITH OR WITHOUT A DOOR & THE DOOR MAY EXIST IN ANY BAY.
5. THE ELEVATION HERE-IN SHOWS T-ANCHORS AT THE BASE OF THE WALL ONLY. THESE ANCHORS MAY ALSO BE USED AT THE TOP OF A WALL IN LIEU OF THE WIND LOAD ANCHORS SHOWN PROVIDING THEY ARE INSTALLED THE SAME AS SHOWN AT THE BASE.
6. DOOR OPENINGS WIDER THAN THAT SHOWN ARE NOT PART OF THE SCOPE OF THIS APPROVAL. IF WIDER DOOR OPENINGS ARE REQUIRED, THEY SHALL BE EVALUATED & CERTIFIED UNDER SEPERATE JOB APPROVAL.
7. WHEN THERE IS NO CONTINUOUS JAMB SUPPORT, THE MINIMUM & MAXIMUM ALLOWABLE SPACE BETWEEN JAMB FRAME MEMBERS & THE OPENING SUBSTRATE OR FINISHES SHALL BE SPECIFIED BY THE ENGINEER OR ARCHITECT OF RECORD FOR EACH JOB BUT SHALL NOT BE LESS THAN 1/2" NOR GREATER THAN 1 3/8". WHEN CONSIDERING TYPE, DEPTH & JOINT SPAN OF SEALANT, THE ENGINEER/ARCHITECT SHALL TAKE INTO CONSIDERATION THE DEFLECTION OF THE JAMB MEMBER THAT WOULD OCCUR WHILE SUPPORTING THE JOB REQUIRED DESIGN WIND PRESSURE. ALSO TO BE CONSIDERED SHALL BE THE MATERIALS & SURFACES TO WHICH THE SEALANT WILL BE APPLIED.

ALLOWABLE DESIGN PRESSURE (SINGLE SPAN NON-REINFORCED CURTAIN WALL)

MAXIMUM MULLION SPAN (IN.)	MAXIMUM LOAD WIDTH (IN.)	ALLOWABLE PRESSURE (POS & NEG PSF)
150	76 1/4	81.0
	72	85.8
	68 5/8	90.0
	62	99.6
144	56	110.0
	76 1/4	84.4
	72	89.4
	68 5/8	93.8
132 & LESS	62	103.8
	58	110.0
	76 1/4	90.0
	72	95.3
	68 5/8	100.0
	62	110.0

- NOTES:
1. SEE ELEVATION FOR DIMENSIONING OF LOAD WIDTH.
 2. PRESSURES SHOWN ARE SPECIFIC TO EACH INDIVIDUAL MULLION SUPPORT AREA. ALLOWABLE PRESSURE MAY VARY FROM BAY TO BAY AS DICTATED BY EACH INDIVIDUAL MULLION CONDITION.
 3. LESSER OF PRESSURES STATED IN THIS TABLE & THE ALLOWABLE GLASS PRESSURE, AS SHOWN ON SHEET 1, SHALL CONTROL AS ALLOWABLE FOR THE WALL ASSEMBLY.
 4. AT SPAN OF 132" & LESS, LOAD WIDTH CONTROLS THE ALLOWABLE PRESSURE. THEREFORE, IT SHALL NOT BE ASSUMED THAT INTERPRETATION OF PRESSURE VALUES CAN BE DONE WITH SPANS UNDER 132". INTERPRETATION OF PRESSURE VALUES BETWEEN THOSE SHOWN MAY APPLY.

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