

PLCW-600 SERIES

2 1/2" x 6"

SECTION



ALUMINUM CURTAIN WALLS PLCW-600 SERIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum curtain walls.

1.2 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
 1. AAMA/NWWDA 101/I.S. 2-97 - Voluntary Specification, Performance Requirements and Test Procedures for Air Leakage Resistance, Water Penetration Resistance, Structural Loading, Forced Entry Resistance.
 2. AAMA-501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure
 3. AAMA 501.4 - Recommended Static Test Method for Evaluating Curtain Wall and Storefront Systems Subjected to Seismic and Wind Induced Interstory Drifts.
 4. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. ASTM International (ASTM):
 1. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 2. ASTM E 283 - Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
 3. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 4. ASTM E 331 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 5. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
 6. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
- C. National Fenestration Rating Council (NFRC):
 1. NFRC-100 - Procedure for Determining Fenestration Product U-factors.
 2. NFRC-200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.

1.3 SUBMITTALS

- A. Submit under provisions of applicable Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.

- 3. Installation methods.
 - C. Shop Drawings:
 - 1. Provide drawings showing each configuration.
 - D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
 - E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.
- 1.4 QUALITY ASSURANCE
- A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
 - B. Installer Qualifications: Minimum 2 year experience installing similar products.
 - C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship is approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.
- 1.5 PRE-INSTALLATION MEETINGS
- A. Convene minimum two weeks prior to starting work of this section.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
 - B. Handling: Handle materials to avoid damage.
- 1.7 PROJECT CONDITIONS
- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
- 1.8 SEQUENCING
- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 PRODUCTS

- A. Acceptable Manufacturer: PRL Glass Systems, Inc., which is located at: 13644 Nelson Ave.; City of Industry, CA 91746; Toll Free Tel: 800-433-7044; Fax: 626-968-9256; Email:[request info \(info@prlglass.com\)](mailto:requestinfo@prlglass.com); Web:prlglass.com
 - B. Substitutions: Not permitted.
 - C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
- 2.2 CURTAIN WALLS

- A. Frame : 2-1/2 inches (64 mm) face width:
 - 1. Glazing: Structural glaze verticals.
 - 2. Glazing: Structural glaze horizontals.

- B. **6 Inches (152 mm) Depth:**
 - 1. **Product: PLCW-600 as manufactured by PRL Glass Systems, Inc.**
 - 2. Performance:
 - a. Air infiltration: Limit air leakage through fixed glazing and frames to 0.026 cfm/ft²/min (0.01 L/s/m²) when tested in accordance with ASTM E-283-04 at a cross pressure of 6.24 psf (0.30 kPa).
 - b. Water Penetration under Static Pressure: System shall not evidence uncontrolled water penetration at a cross pressure of 15 psf (103 kPa) when tested in accordance with ASTM-E331-00.
 - c. Water Penetration under Dynamic Pressure: System shall not evidence uncontrolled water penetration at a cross pressure of 15 psf (103 kPa) when tested in accordance with AAMA-501.1-05.
 - d. Design Wind Load: Limit mullion deflection to L/175 up to 13 feet-6 inches (4115 mm) and L/240+1/4 inch (6 mm) for spans above 13 feet-6 inches (4115 mm) when measured in accordance with ASTM E330-02 at a cross pressure of 40 psf (276 kPa).
 - e. Seismic Racking: Compliance that system can accommodate a lateral movement of 3/4 inch (19 mm) when tested to AAMA 501.4-00.
 - f. Thermal Conductance: Whole product rating shall be determined in accordance with NFRC-100. Show that specified product can achieve U-factor of no greater than 0.37 (Values based on structural glaze verticals, and insulated glass comprising exterior light of 1/4 inch (6 mm) bronze, 1/2 inch (13 mm) space with argon fill and an interior light of 1/4 inch (6 mm) SunGuard SNX 62/27).
 - g. Solar Heat Gain: Whole product rating shall be determined in accordance with NFRC-200. Show that the specified product can achieve a SHGC of no greater than 0.36. (Values based on structural glaze verticals, and insulated glass comprising exterior light of 1/4 inch (6 mm) bronze, 1/2 inch (13 mm) space with argon fill and an interior light of 1/4 inch (6 mm) SunGuard SNX 62/27).
 - h. Large Missile Impact: Design and fabrication shall meet the performance requirements in the referenced test procedures for a +1676/-2873 Pa (+35/-60 psf) design pressure with missile impacts corresponding to Missile Level D and Wind Zone 3 for a Basic Protection Rating. (Laminated I.G. 1-1/8 inches (29 mm) I.G. Marine glazed into a rubber glazing gasket.

2.3 MATERIALS

- A. Material: Frames, assembly clips, trims and miscellaneous extrusions shall be extruded from Aluminum 6063-T6 alloy.

- B. Glazing Gaskets:
 - 1. Compression type gaskets. Extruded EPDM (Ethylene Propylene Diene Monomer) push in place gasket. Dense 60 Durometer Shore "A" - ASTM C864 Option II
 - 2. Structural silicone compatible gasket: true silicone gasket -70 Durometer Shore "A", complying with ASTM C1115, Type C.

- C. Thermal isolators: extruded rigid Geon complying with AAMA-303 and ASTM-D-1784-9.

- D. End Dams: Pre-molded end dams made from closed cell EPDM (Ethylene Propylene Diene Monomer) sponge to ASTM C509.

2.4 SUN CONTROL:

- A. Vertical Sunshade:

- B. Horizontal Sunshade:
- C. Light Shelf Adaptable:

2.5 FINISH

- A. Class II clear anodized aluminum shall conform to AA-M12-C22-A31.
- B. Class I clear anodized aluminum shall conform to AA-M12-C22-A41.
- C. Class II color anodized aluminum shall conform to AA-M12-C22-A34.
 - 1. Color: Champagne.
 - 2. Color: Light Bronze.
 - 3. Color: Medium Bronze.
 - 4. Color: Dark Bronze.
 - 5. Color: Black.
- D. Class I color anodized aluminum shall conform to AA-M12-C22-A44.
 - 1. Color: Champagne.
 - 2. Color: Light Bronze.
 - 3. Color: Medium Bronze.
 - 4. Color: Dark Bronze.
 - 5. Color: Black.
- E. Fluorocarbon finish complying with AAMA 2605.
 - 1. Resin: 70% PVDF resin shall be Kynar using Kynar500/Hylar5000.
 - 2. Cleaned and pretreated with chromium phosphate
 - 3. Coat extrusions with approved primers to minimum dry film thickness of 0.20 mil (.0051 mm).
 - 4. Color coat shall be a minimum dry film thickness of 1.0 mil (.025 mm).
 - 5. Approved Coating Manufacturers:
 - a. PPG Industries
 - b. Valspar Corporation

EXECUTION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.4 FIELD QUALITY CONTROL

- A. Owner will engage an independent AAMA approved testing agency.

- B. Conduct test under the supervision of and in the presence of the Owner, Architect, and Construction Manager.
- C. Test wall in accordance with AAMA 501.2-94.

3.5 PROTECTION

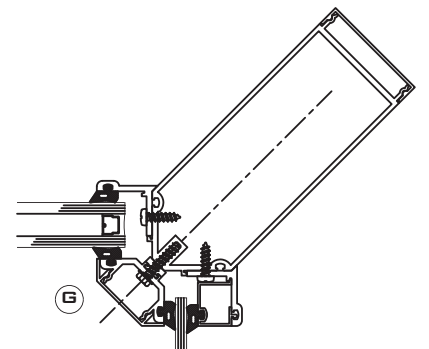
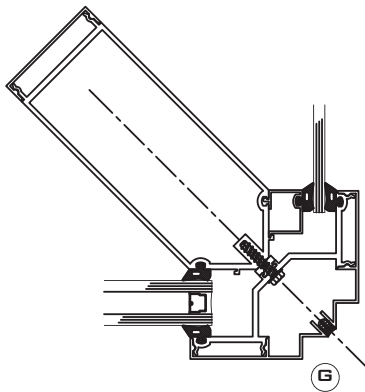
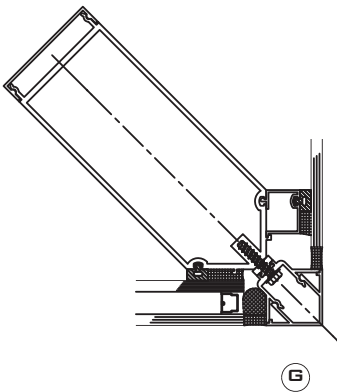
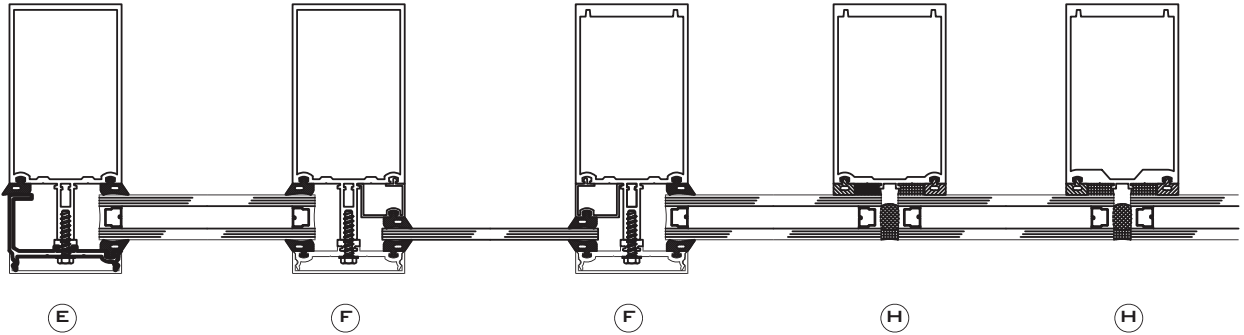
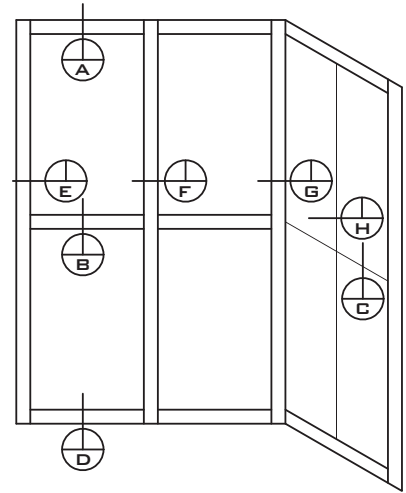
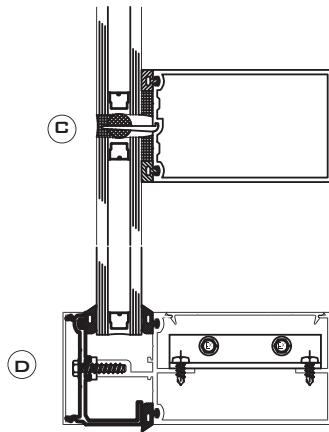
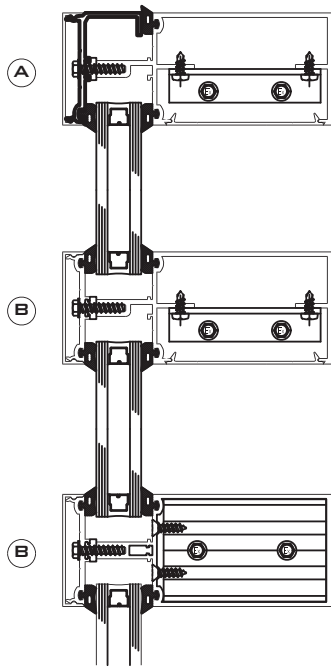
- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

PLCW-600 SERIES

2 1/2" x 6"

1/4 SCALE



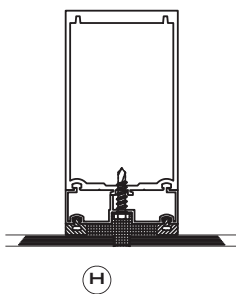
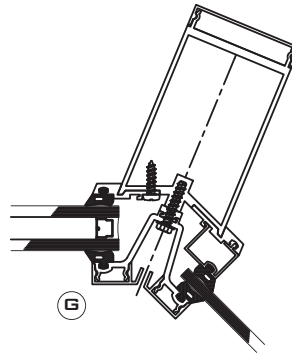
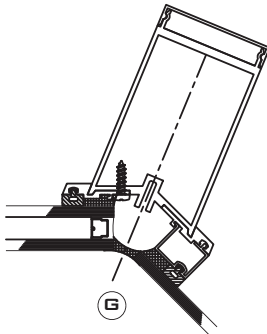
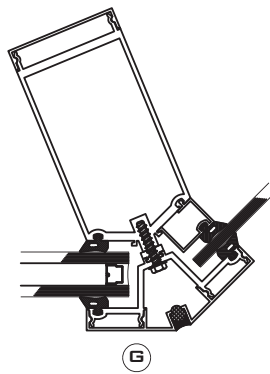
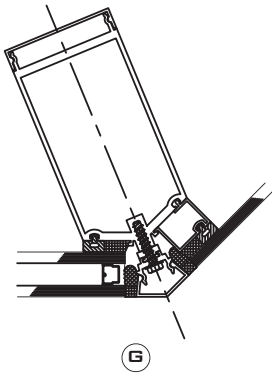
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PLCW-600 SERIES
2 1/2" x 6"
1/4 SCALE

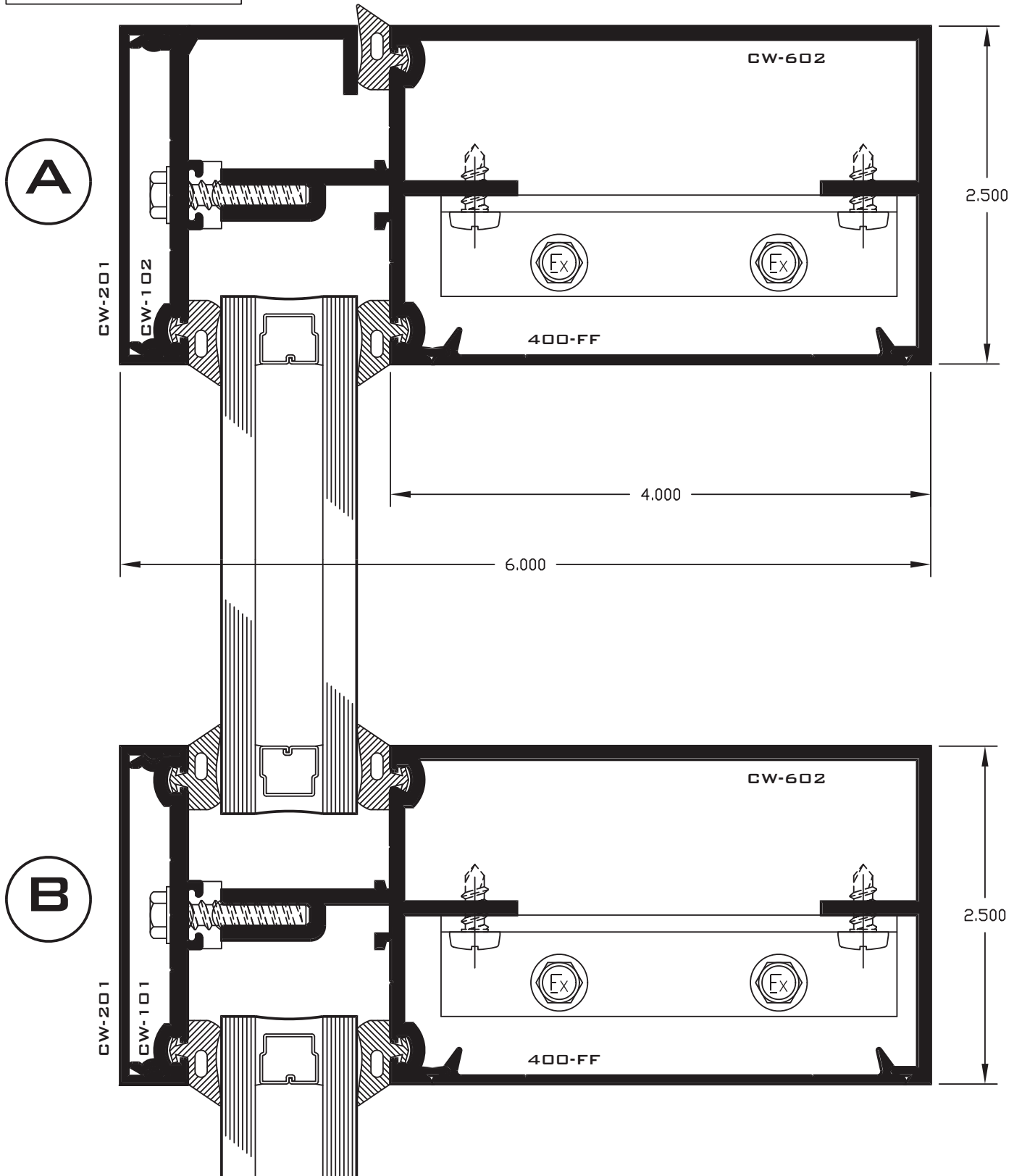


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PLCW-600 SERIES
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FULL SCALE



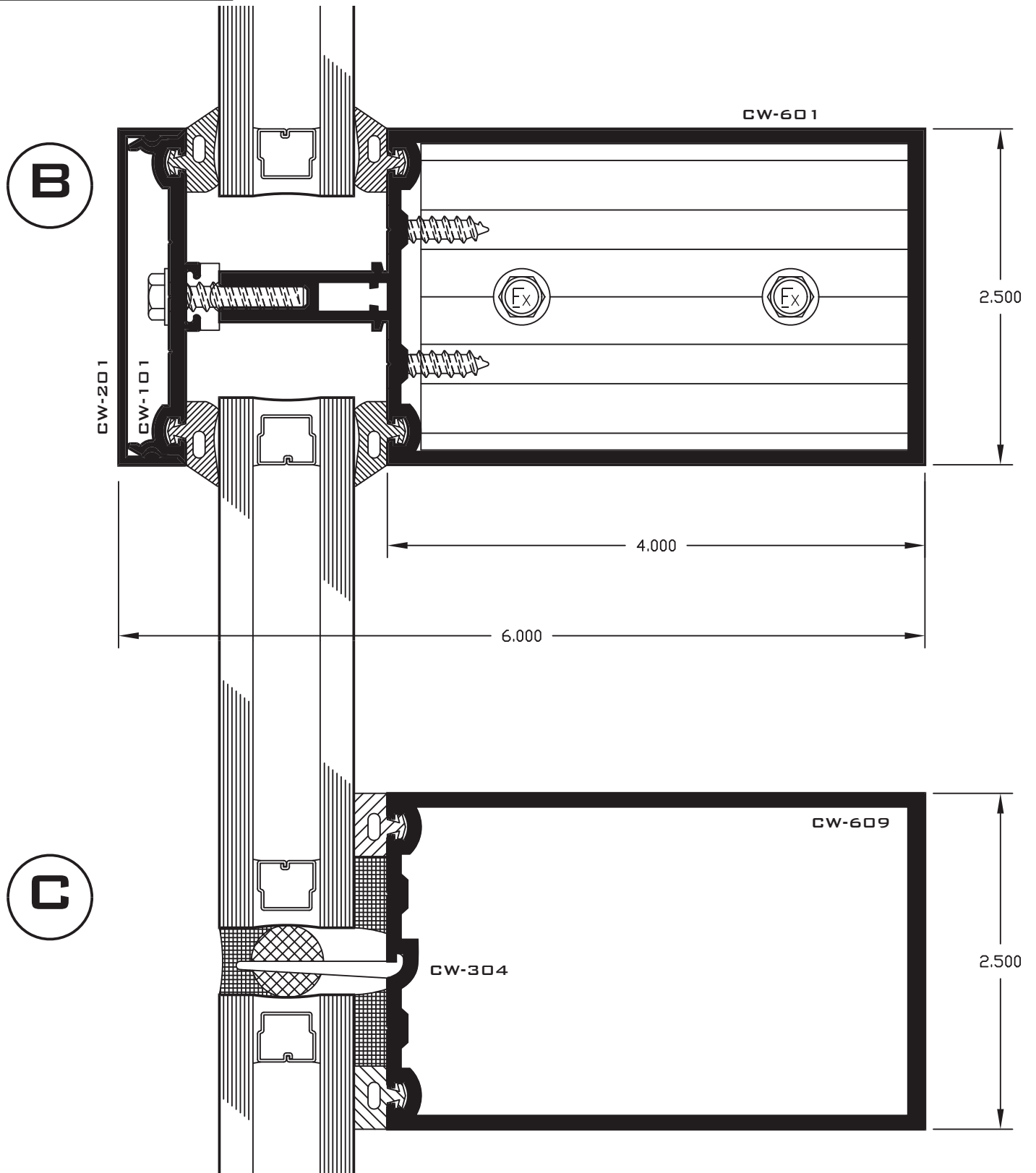
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PLCW-600 SERIES
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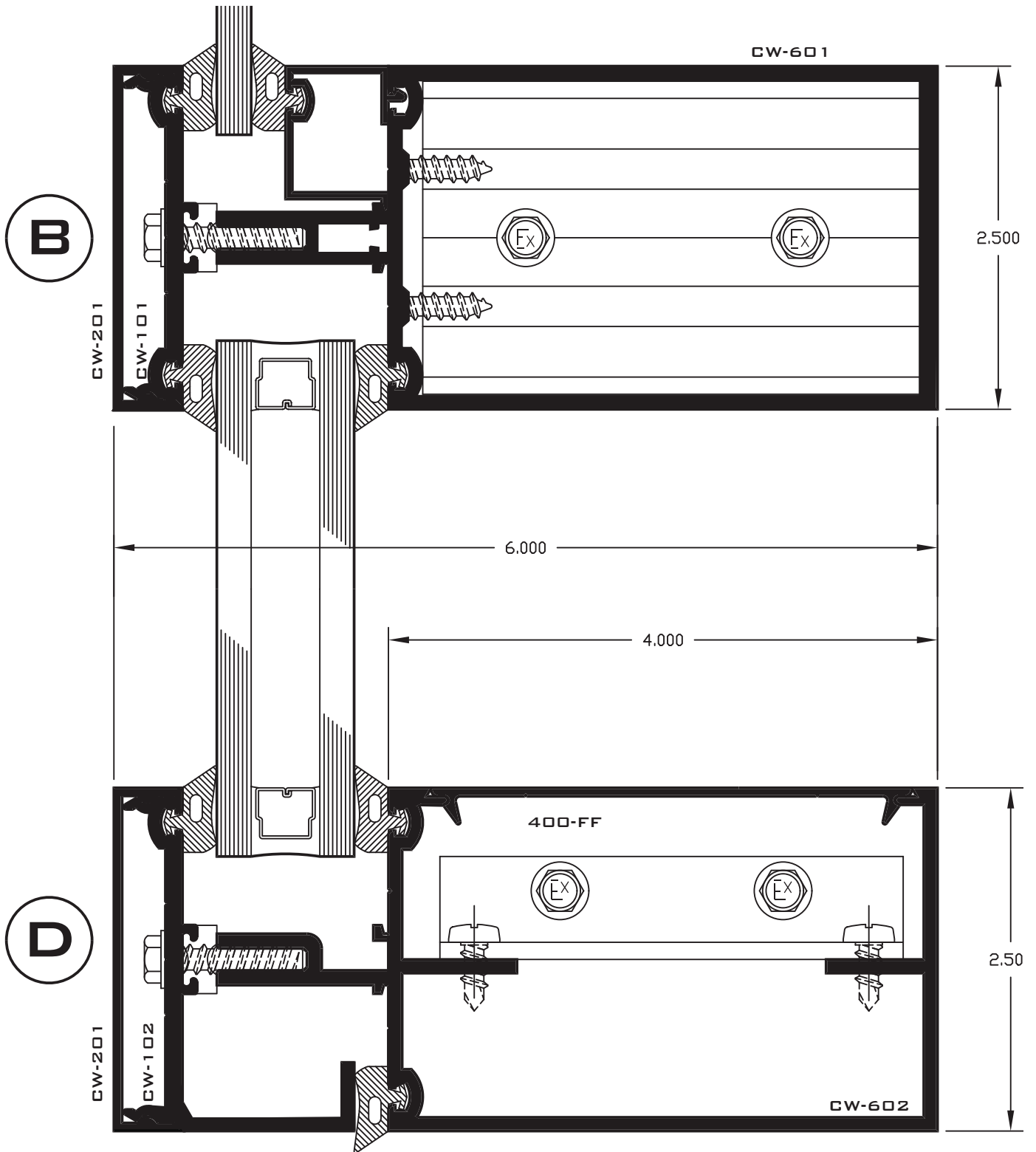
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2 1/2" x 6"

FULL SCALE



DETAIL AT SPANDREL

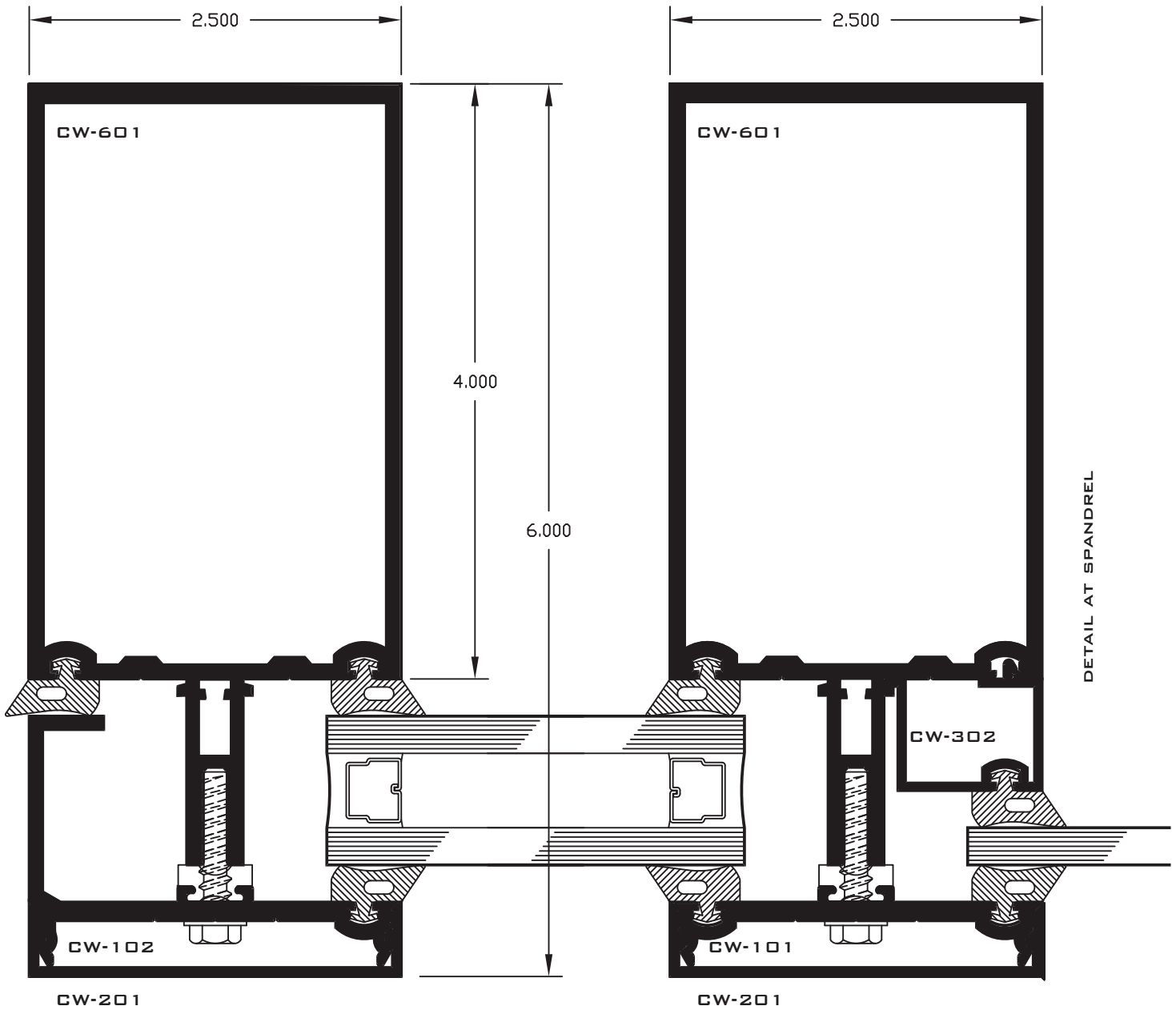


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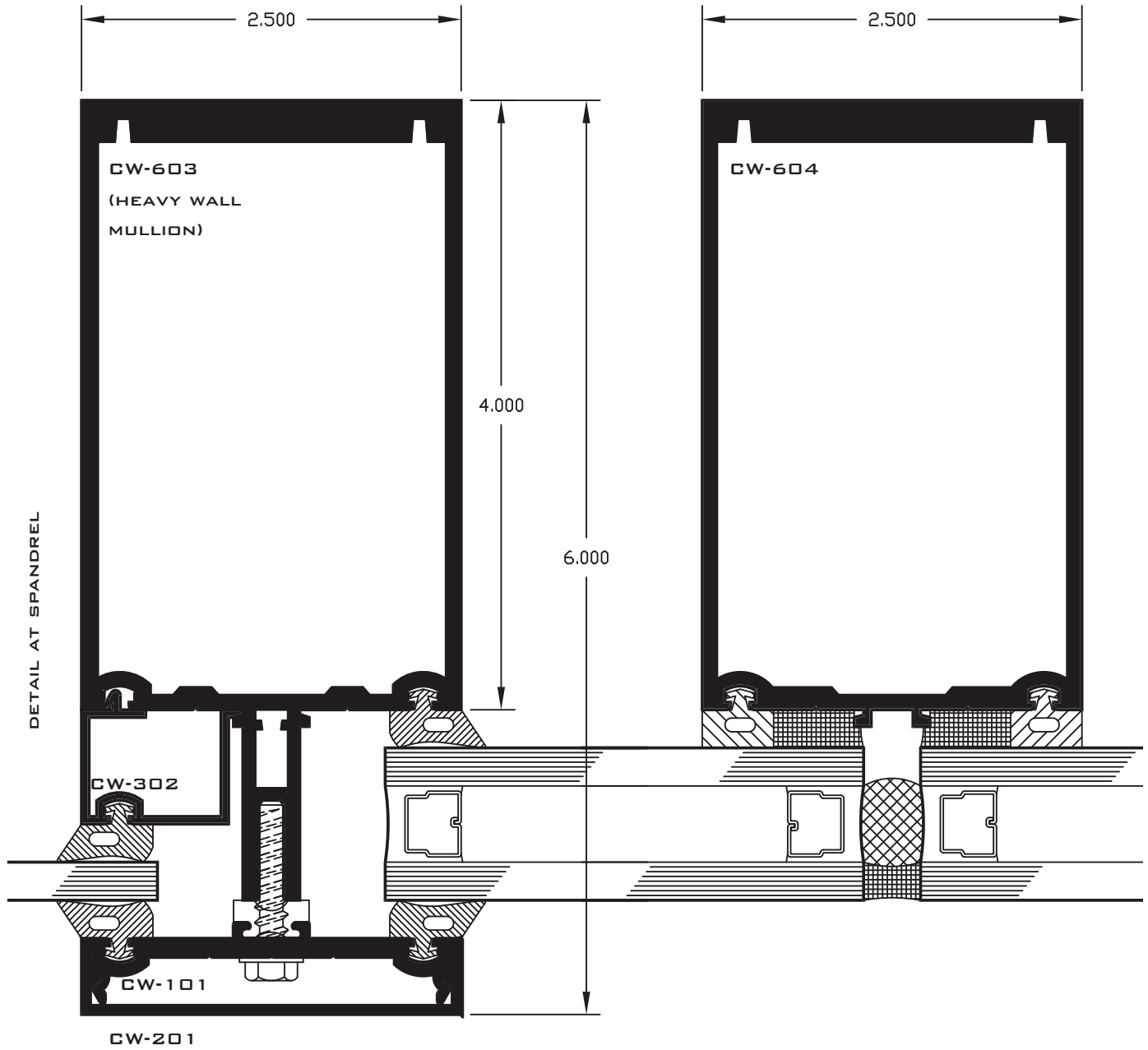
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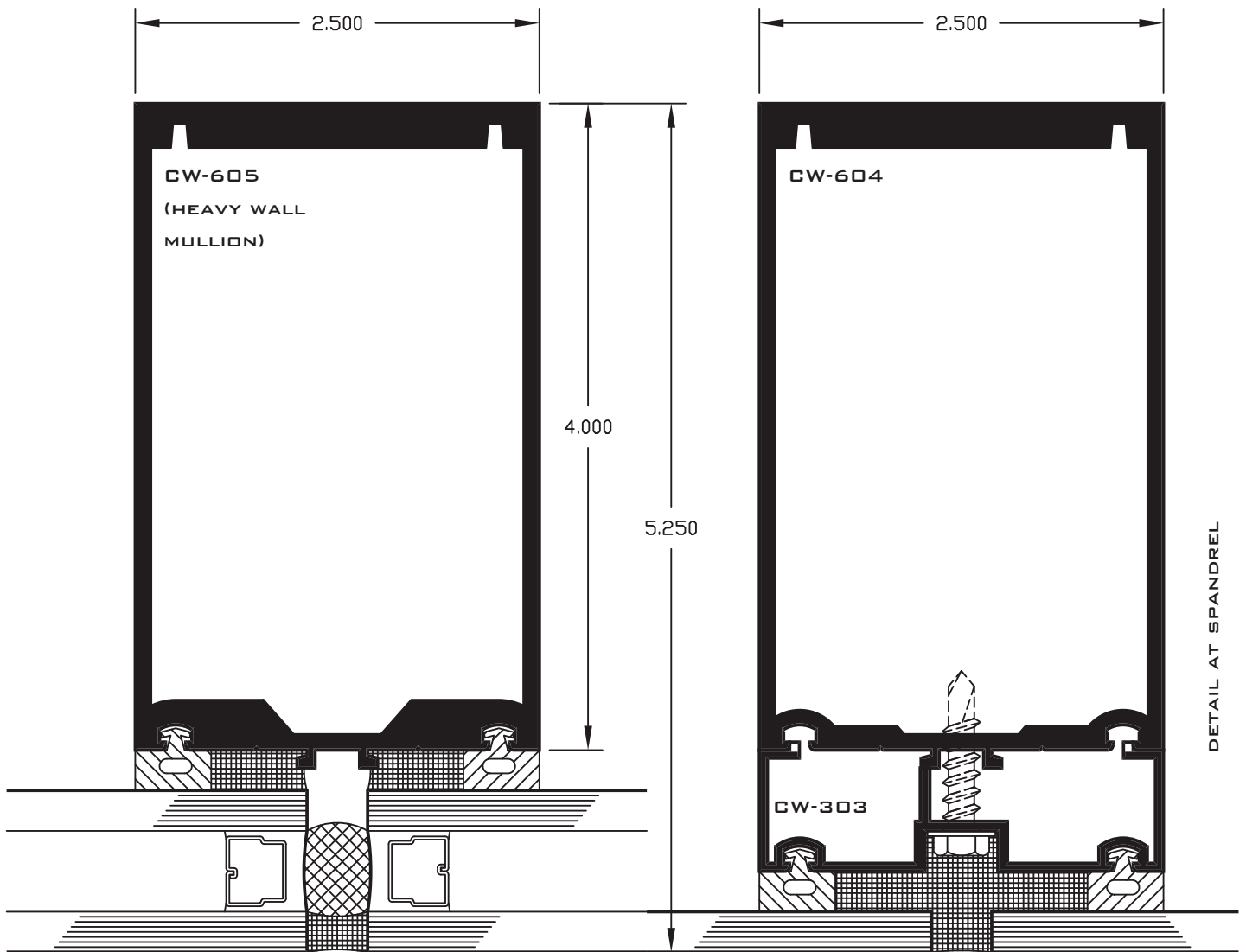
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FULL SCALE



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FULL SCALE

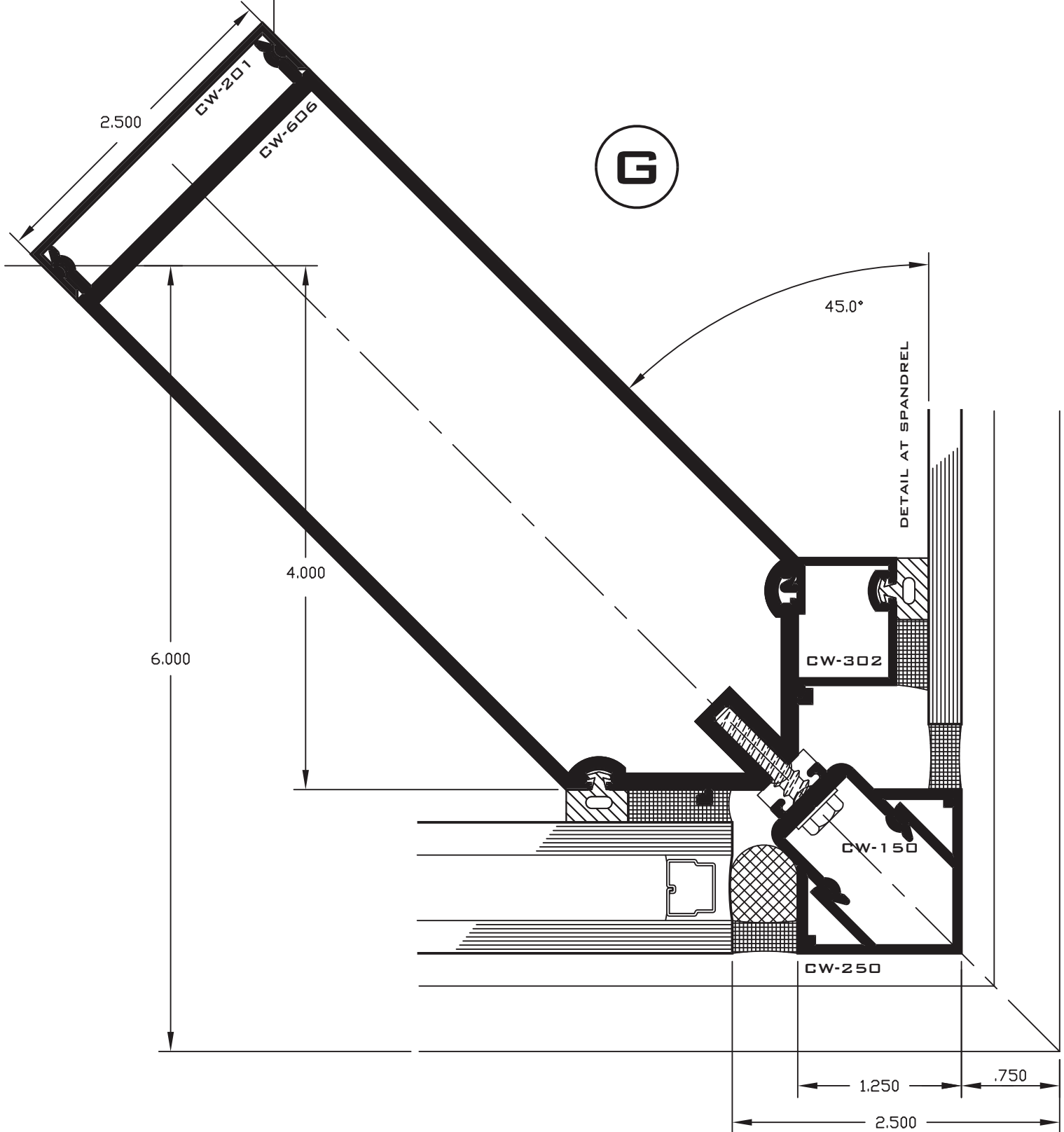


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PLCW-600 SERIES
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FULL SCALE

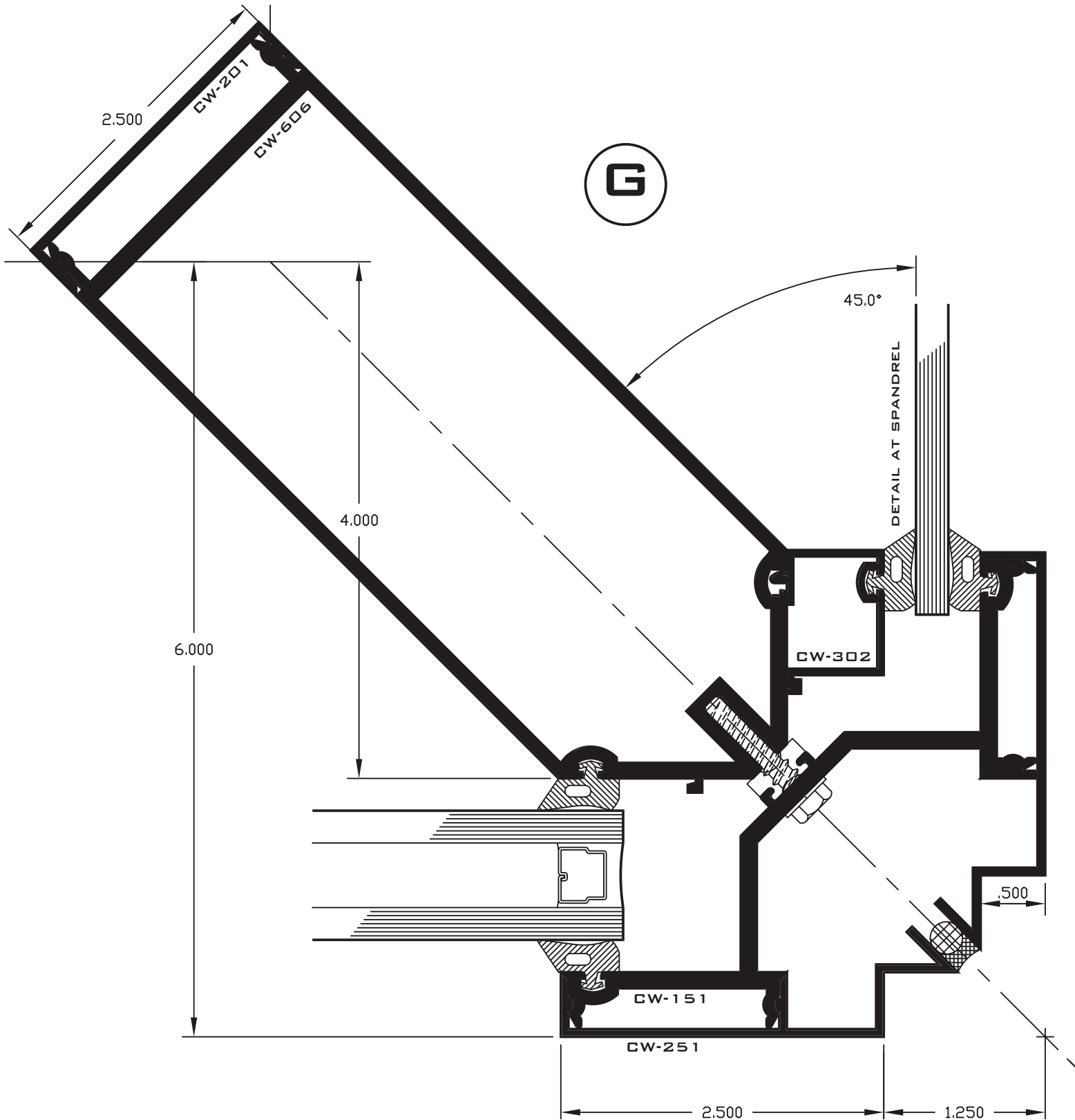


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PLCW-600 SERIES
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FULL SCALE



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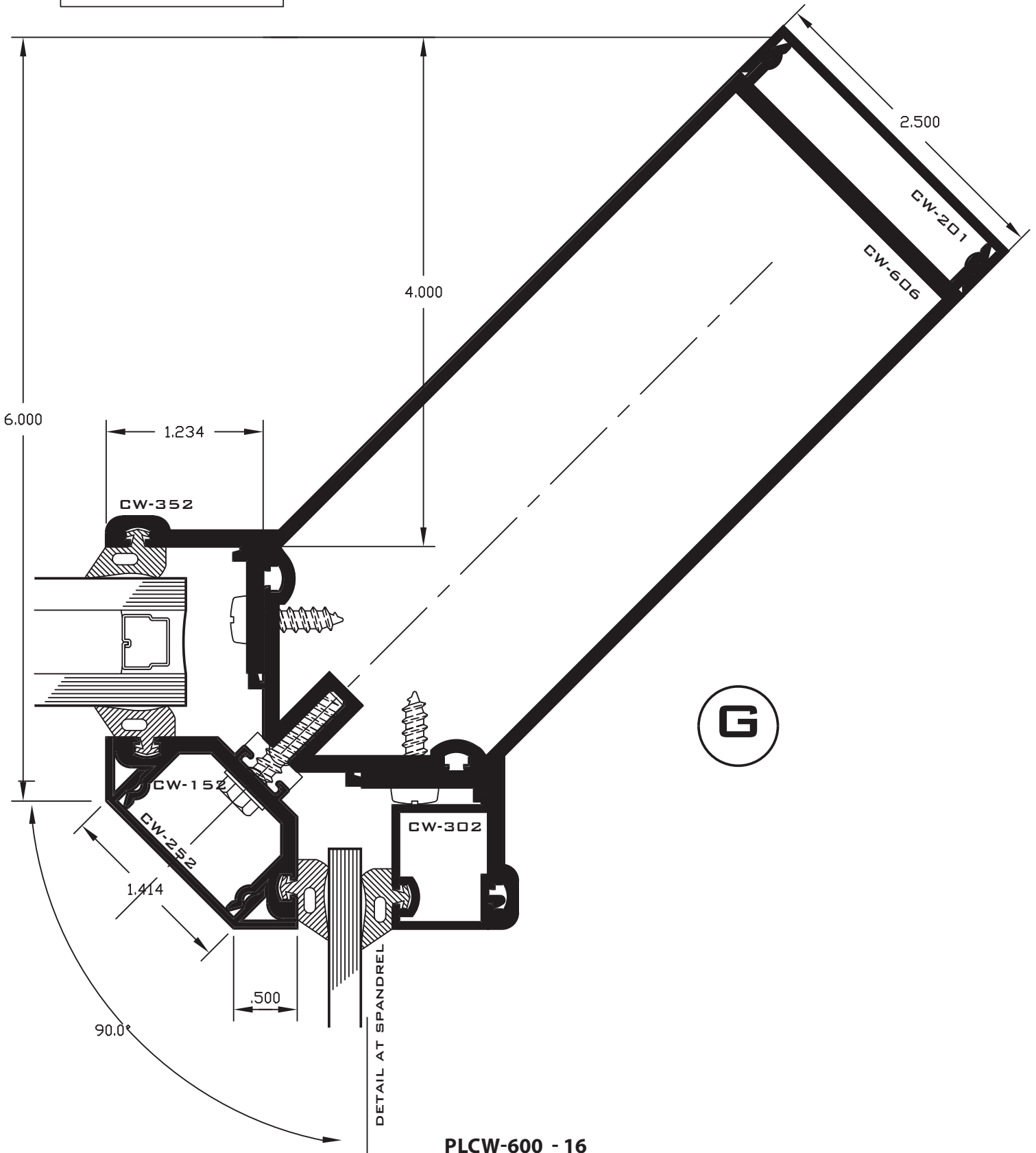
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PLCW-600 SERIES

2 1/2" x 6"

FULL SCALE

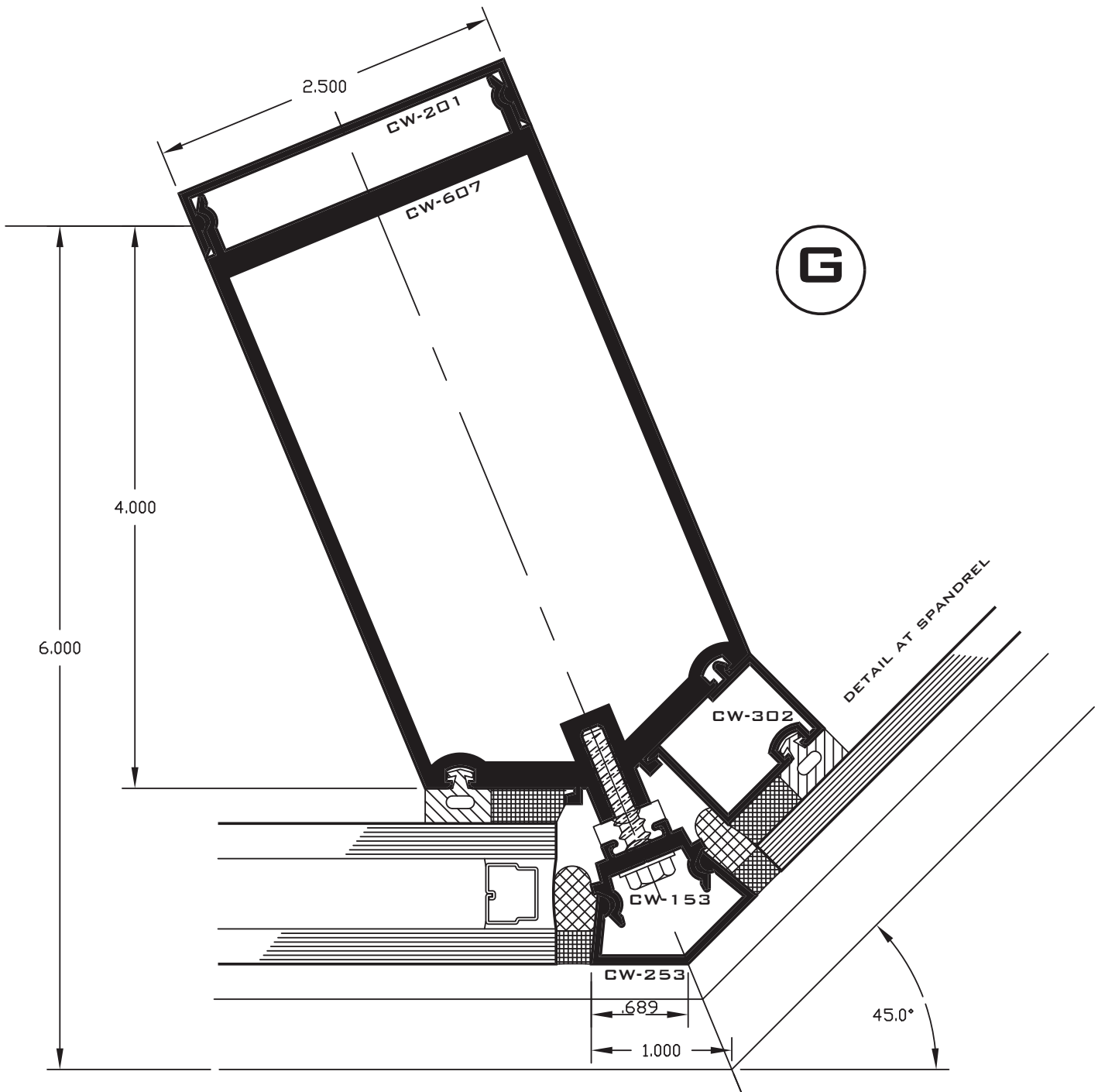


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PLCW-600 SERIES
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FULL SCALE



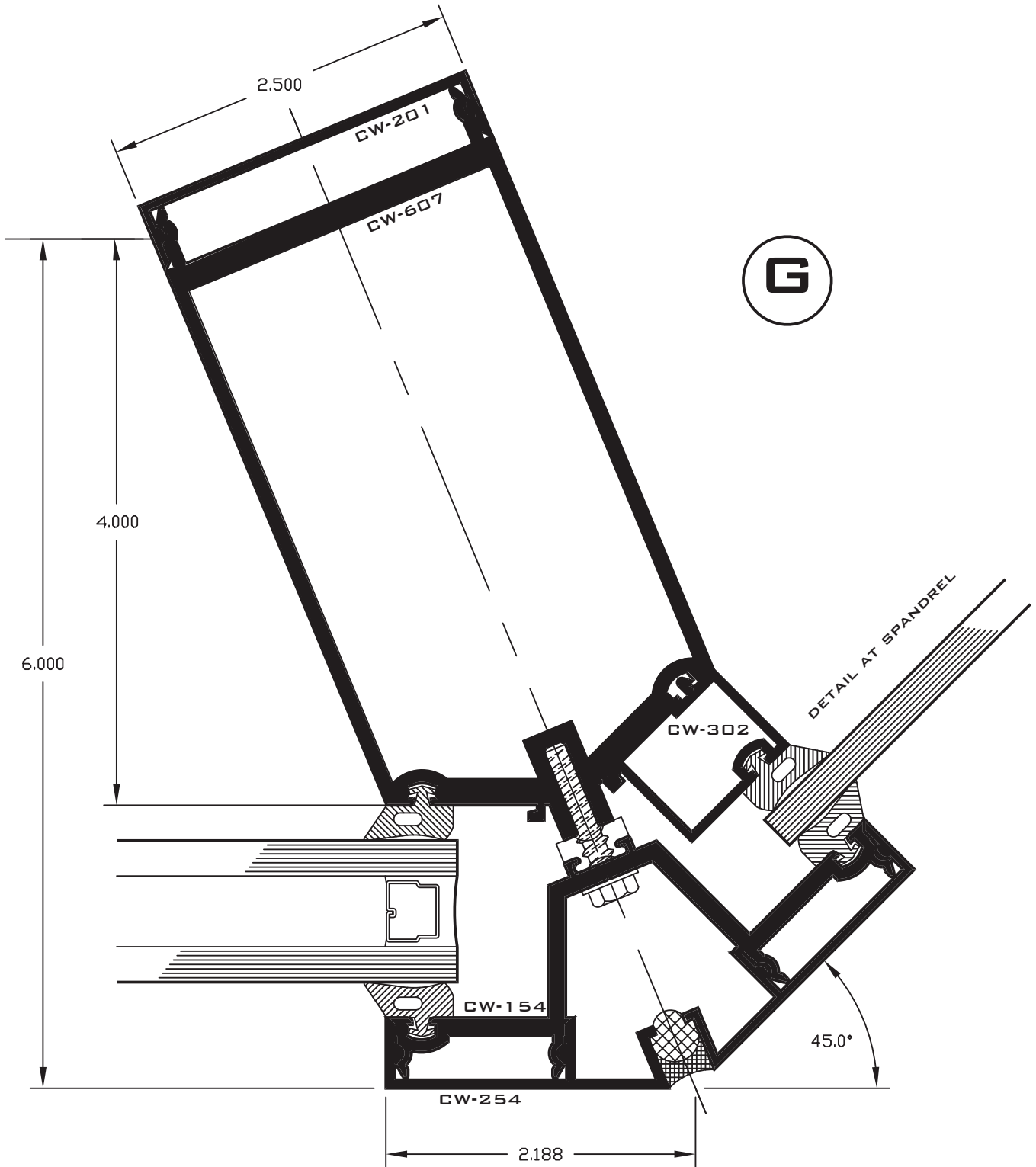
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FULL SCALE

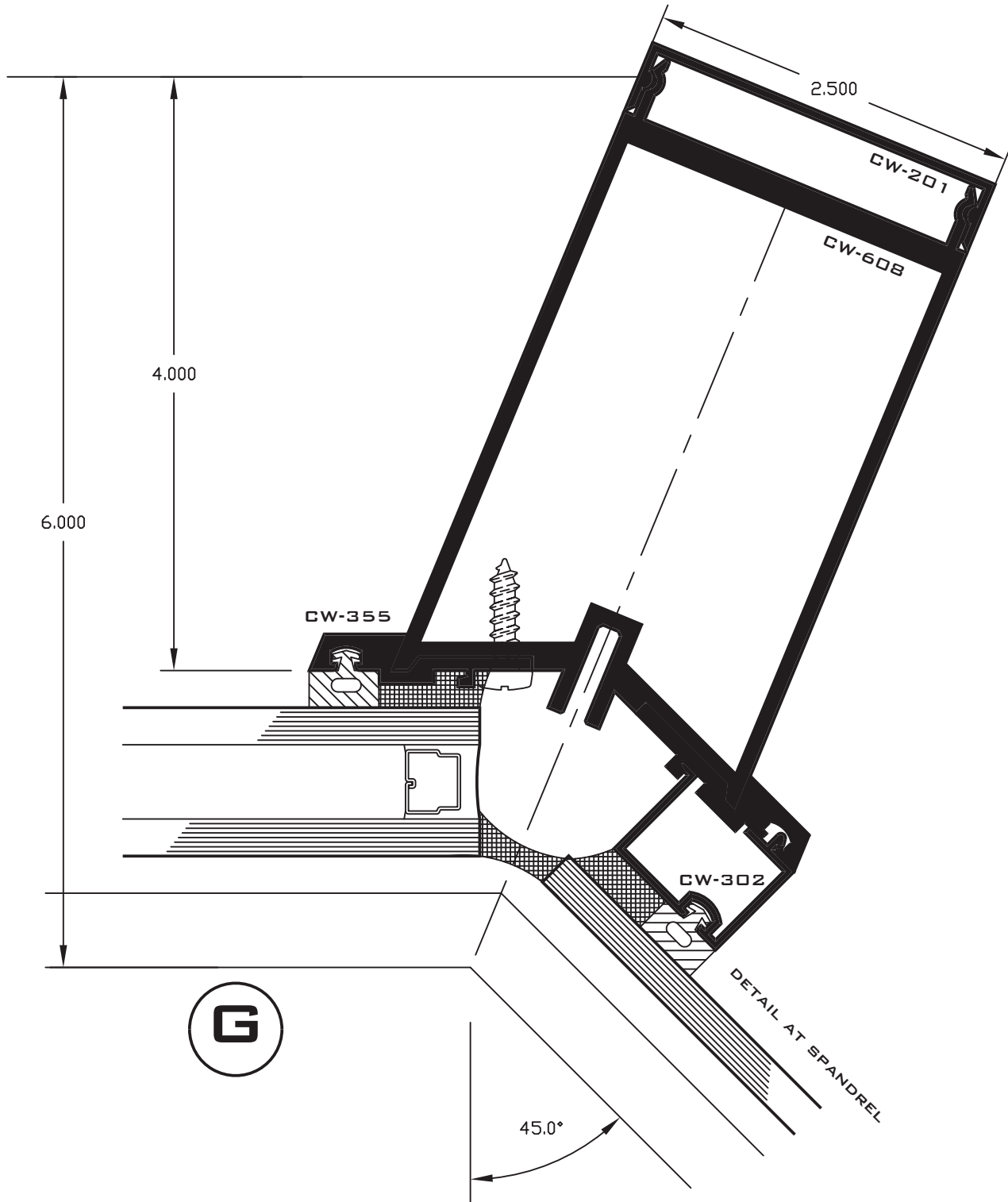


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FULL SCALE

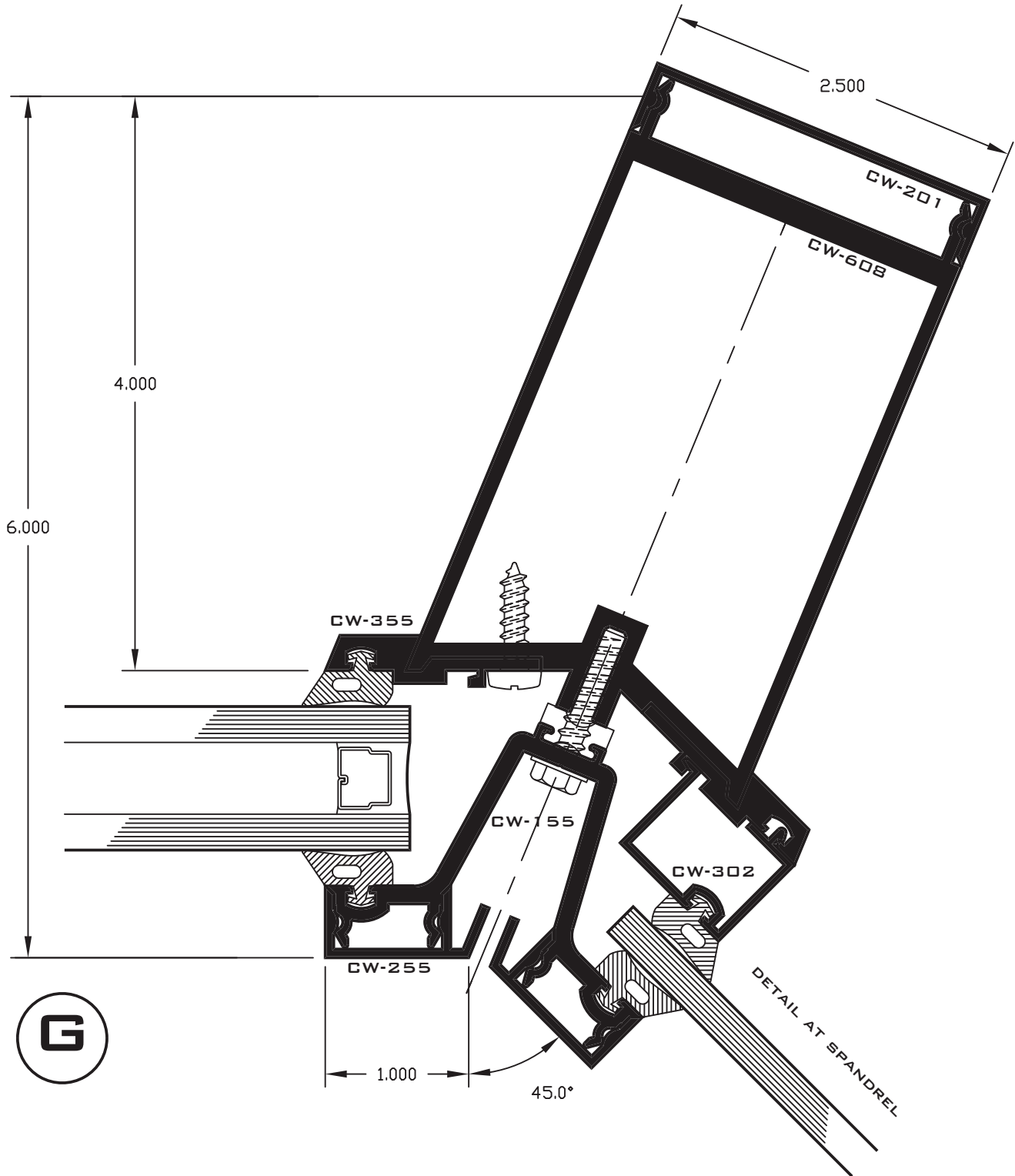


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PLCW-600 SERIES
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FULL SCALE



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PLCW-600 SERIES
2 1/2" x 6"
WIND LOAD



wind load design

Mullion deflection is limited per AAMA TIR-A11-04
 deflection is limited to L/175 for spans up to 13'-6"
 and L/240 for spans beyond 13'-6"

allowable stress for 6063-T6 aluminum alloy = 15000 p.s.i.
 allowable stress for A-36 steel = 21600 p.s.i.

maximum deflection was based on the following equation:

$$\Delta = \frac{5WL^3}{384EI}$$

maximum bending moment was based on the following equation:

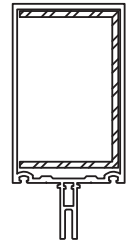
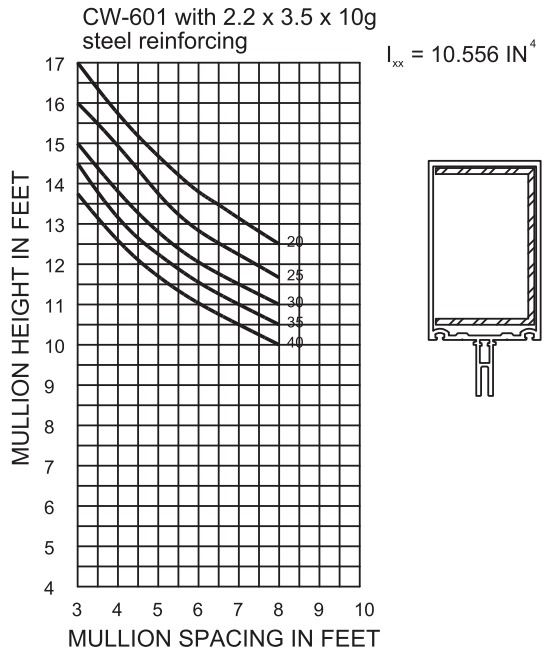
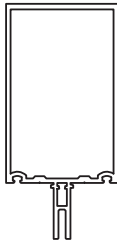
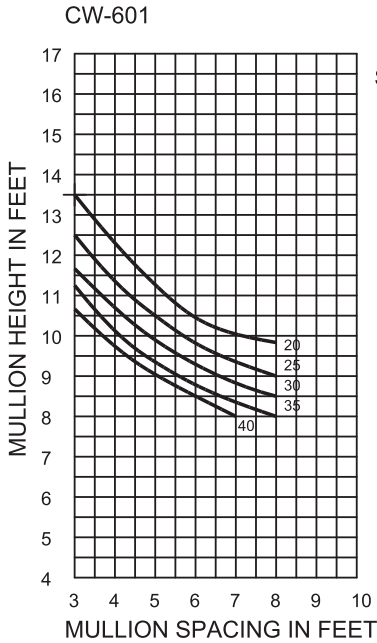
$$M = \frac{WL}{8}$$

assumptions:

- W = total uniform load
- L = length of mullion between anchors
- E = 10×10^6 p.s.i.
- I = moment of inertia of the mullion
- M = maximum bending moment

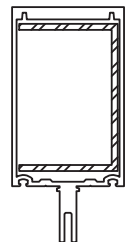
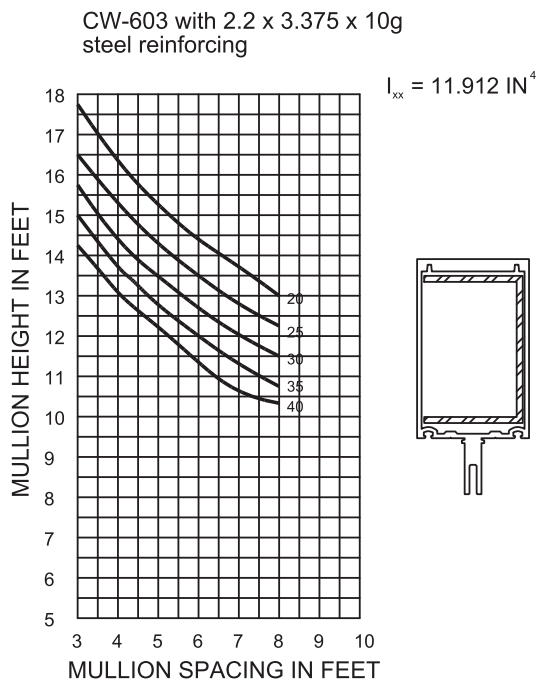
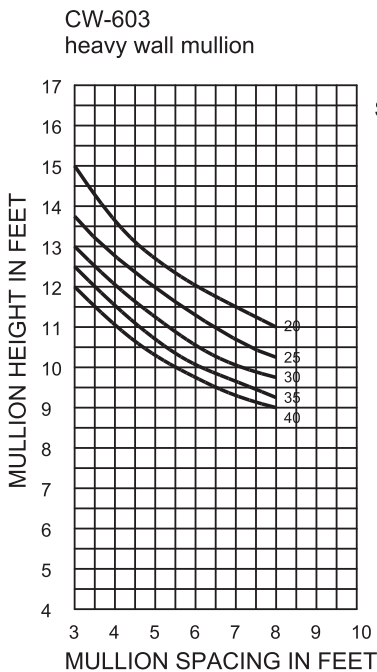
* mullions are assumed to have equal size glass lights each side
 check with local code requirements for acceptance of AAMA TIR-A11

PLCW-600 SERIES
2 1/2" x 6"
WIND LOAD



CURVE REPRESENTATION

A	= 20 P.S.F.
B	= 25 P.S.F.
C	= 30 P.S.F.
D	= 35 P.S.F.
E	= 40 P.S.F.



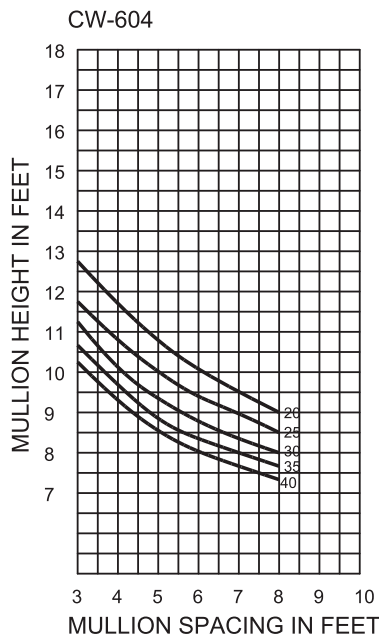
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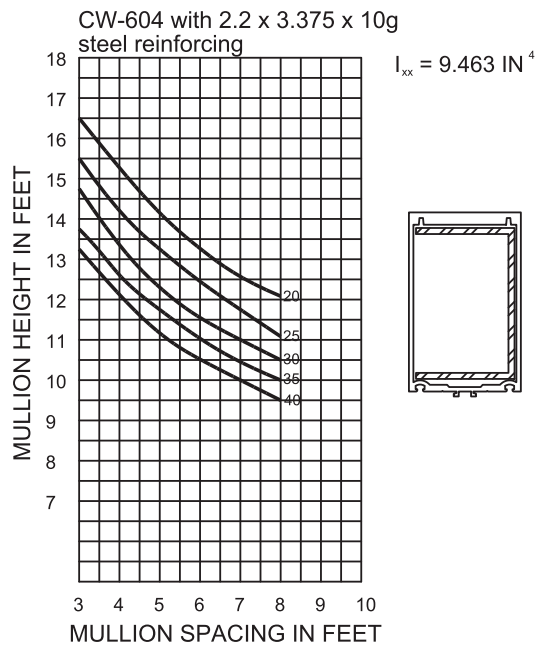
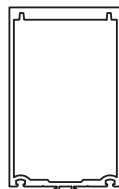
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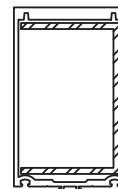
PLCW-600 SERIES
2 1/2" x 6"
WIND LOAD



$I_{xx} = 4.153 \text{ IN}^4$
 $S_{xx} = 1.794 \text{ IN}^3$

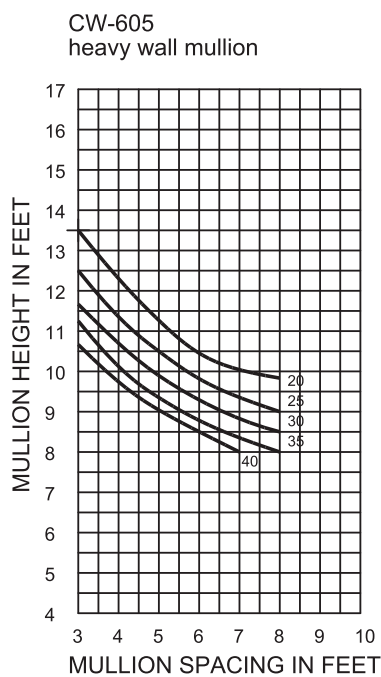


$I_{xx} = 9.463 \text{ IN}^4$

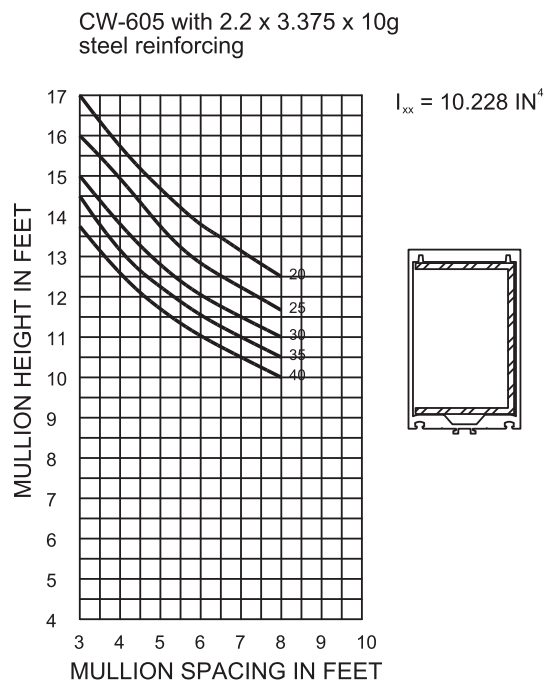
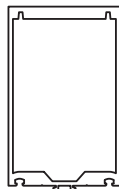


CURVE REPRESENTATION

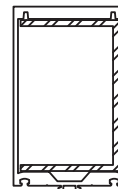
A	= 20 P.S.F.
B	= 25 P.S.F.
C	= 30 P.S.F.
D	= 35 P.S.F.
E	= 40 P.S.F.



$I_{xx} = 4.918 \text{ IN}^4$
 $S_{xx} = 2.342 \text{ IN}^3$



$I_{xx} = 10.228 \text{ IN}^4$



PLCW-600 SERIES

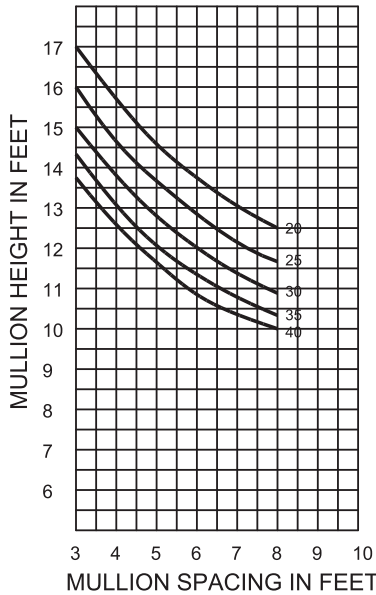
2 1/2" x 6"

WIND LOAD



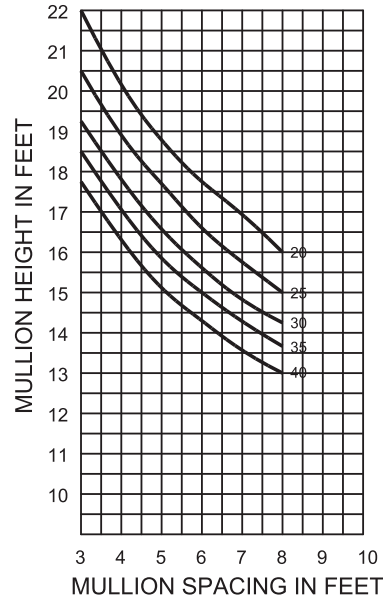
CW-606
90° inside/outside corner

$I_{xx} = 10.306 \text{ IN}^4$
 $S_{xx} = 2.943 \text{ IN}^3$



CW-606 with 2.2 x 5.0 x 10g
steel reinforcing

$I_{xx} = 23.483 \text{ IN}^4$

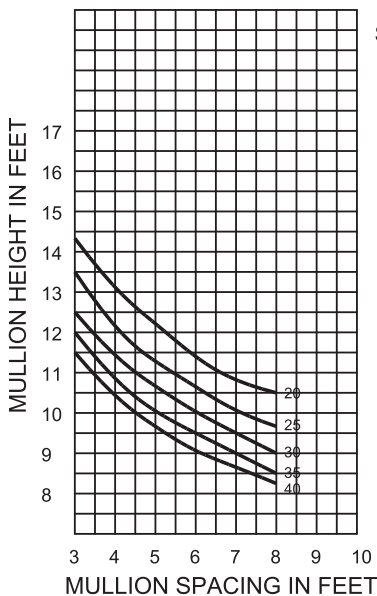


CURVE REPRESENTATION

- A = 20 P.S.F.
- B = 25 P.S.F.
- C = 30 P.S.F.
- D = 35 P.S.F.
- E = 40 P.S.F.

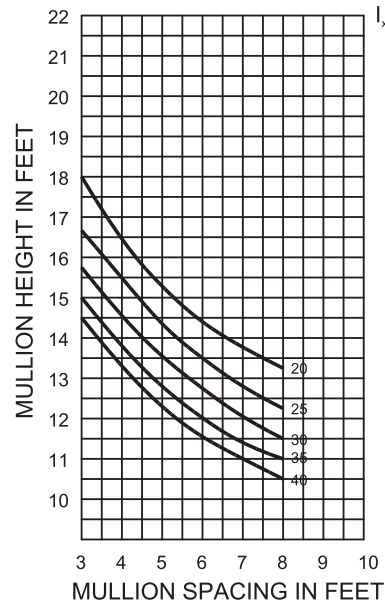
CW-607
135° outside corner mullion

$I_{xx} = 5.915 \text{ IN}^4$
 $S_{xx} = 2.247 \text{ IN}^3$

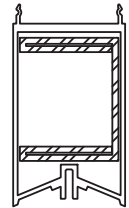
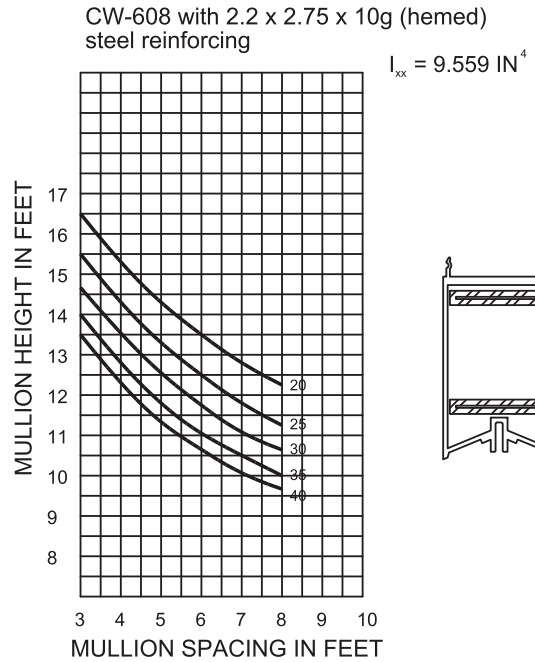
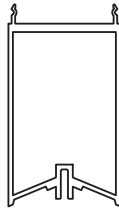
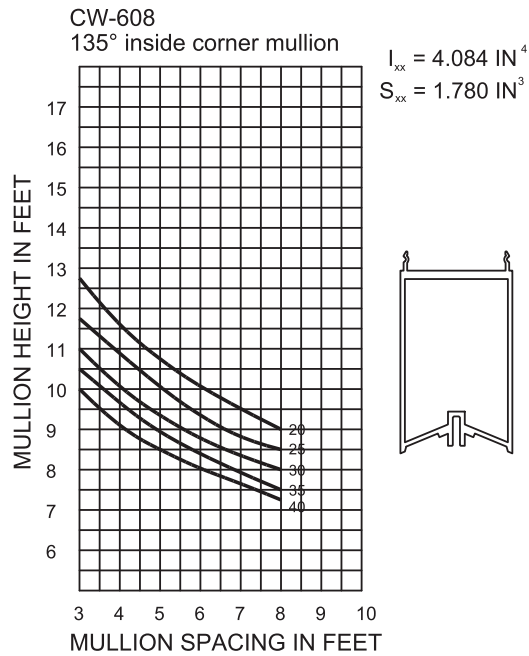


CW-607 with 2.2 x 3.625 x 10g
steel reinforcing

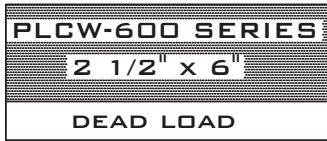
$I_{xx} = 12.166 \text{ IN}^4$



PLCW-600 SERIES
2 1/2" x 6"
WIND LOAD



CURVE REPRESENTATION	
A	= 20 P.S.F.
B	= 25 P.S.F.
C	= 30 P.S.F.
D	= 35 P.S.F.
E	= 40 P.S.F.



dead load design

horizontal mullion deflection is limited to $L/360$ or $1/8"$ (whichever is less)
curves represent limitations based on 2 point loads, equal in magnitude
both located at $1/8$ or $1/4$ point of the horizontal mullions length

allowable stress for 6063-T6 aluminum alloy = 15000 p.s.i.
allowable stress for A-36 steel = 21600 p.s.i.

maximum deflection was based on the following equation:

$$\Delta = \frac{Pa}{24EI} (3L^2 - 4a^2)$$

maximum bending moment was based on the following equation:

$$M = Pa$$

assumptions:

$P = 1/2$ glass weight

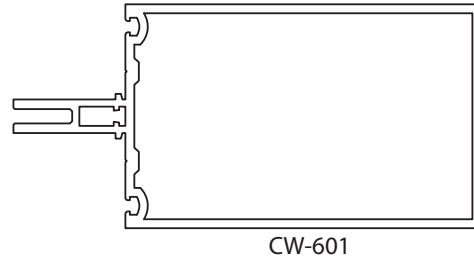
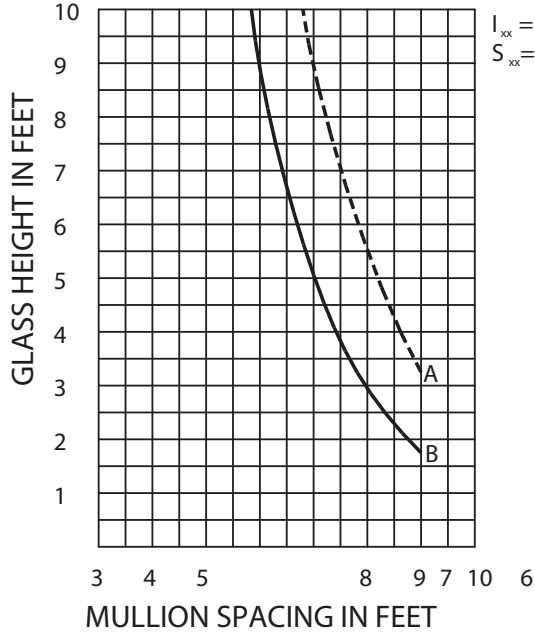
$a = 1/4$ or $1/8$ point of span (in inches)

$E = 10 \times 10^6$ p.s.i.

$I =$ moment of inertia of the mullion

$L =$ length of horizontal mullion

PLCW-600 SERIES
2 1/2" x 6"
DEAD LOAD



CURVE REPRESENTATION
A (- - - - -) = 1/8 PTS.
B (———) = 1/4 PTS.

