SECTION B2
SERIES CF451T STOREFRONT SYSTEM
2" X 4½" for 1" GLAZING
SECTION B2

SERIES CF451T (Thermal) STOREFRONT SYSTEM
SERIES CF451 (Non-Thermal) STOREFRONT SYSTEM
2” X 4½” FOR 1” GLAZING

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Series CF451T Features:
Series CF451T is a commercial flush glazed system for exterior glazing ground floor applications or interior glazing when used as a low rise window wall system. The system is designed for the vertical mullions and filler plates to run through for optimum strength. All Cardinal Commercial Products framing is mechanically jointed using self-tapping screws into integral splines extruded within the body of the section. Jointing is by butt joints with applied sealant to protect against water egress and to reduce air infiltration.

System features:
► Sightline 2” x 4½” for 1” glazing infill
► May also be used for Non-thermal applications (Series CF451)
► EPDM glazing gaskets
► Shop fabrication and precision punch die fabrication for screw spline holes
► Shop supervision and quality control
► Ladder assembly for transportation to job site for quicker installation
► Heavy duty mullions and/or steel reinforcement to meet high wind velocity requirements
► Sill receptor allows for heads of structural fasteners in subsill to be sealed prior to installing ladder panels
► Framing accepts Series 200, 300 and 500 entrance doors
 SERIES CF451T 2” x 4 1/2” - B2  

SYSTEM FEATURES

Full height subsill receptor eliminates blind seals where structural fasteners penetrate subsill.

WD451 ABS Plastic Molded Water Diverters

Weep Hole

Glass not shown for clarity.

Weep Holes backed with 30 ppi polyester baffles

Glass

Full height subsill receptor eliminates blind seals where structural fasteners penetrate subsill.
SERIES CF451T 2" x 4 1/2" - B2
STANDARD FRAMING DETAILS

KEY ELEVATION

FRAME WIDTH
MASONRY OPENING

FRAME HEIGHT
MULLION LENGTH
MASONRY OPENING

EXTERIOR GLAZE

INTERIOR GLAZE
SERIES CF451T 2” x 4 1/2” - B2

CORNER DETAILS

KEY ELEVATION

1
2
3
4

FRAME WIDTH

D.L.O.

GSK-1 (Typ)

CF451-12T

CF451-9T

CF451-8T

CF450-20

CF450-21

CF450-20

CF450-21

OTHER COMBINATIONS

NO POCKETS
(Post)

ONE POCKET
(Terminating End)

TWO POCKETS
(Straight Wall)

THREE POCKETS
(Intersecting Walls)

FOUR POCKETS
(Intersecting Walls)

CF450-11

CF451-12T

CF451-9T

CF451-8T

CF450-20

CF450-21

CF451-8T

CF451-10T

CF451-10T

FORMED ALUMINUM TRIM

VARIES

COLUMN COVERS

FORMED ALUMINUM TRIM

ALUMINUM TRIM

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SERIES CF451T 2” x 4½” - B2

VERTICAL OFFSET PIVOT HUNG DOORFRAME DETAILS

KEY ELEVATION

ENTRANCE

FRAME WIDTH
MASONRY OPENING

D.L.O.
2”

GSK-1
(Typ)

CF451-4T

CF451-30

T450

CF200-6-1

CD100-2

1” Insulated Glass

D.L.O.
2”

DOOR OPENING
MASONRY OPENING

D.L.O.
2”

DOOR OPENING
MASONRY OPENING

D.L.O.
2”

DOOR OPENING
MASONRY OPENING

DOOR OPENING
MASONRY OPENING

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SERIES CF451T 2” x 4 1/2” - B2
HORIZONTAL OFFSET BUTT HUNG DOORFRAME DETAILS

KEY ELEVATION
ENTRANCE

1
2
2A
3

1
2
2A
3A

4
4A

MASONRY OPENING
FRAME WIDTH
DOOR OPENING

1
2
3
4

1/4"
2"
DLO

1/4"
3/4"

1" Insulated Glass

1" Insulated Glass

CF451-31
CF200-8

COC

CD100-8
T450

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SERIES CF451T 2” x 4 1/2” - B2

VERTICAL OFFSET BUTT HUNG DOORFRAME DETAILS

DOOR OPENING

KEY ELEVATION

ENTRANCE

FRAME WIDTH
MASONRY OPENING

D.L.O.
DLO

1 1/4"

2" 1 1/4"

3 1/8"

2 1/4"

3 1/8"

1" Insulated Glass

CD100-2

CF200-6-1

T450
SERIES CF451T 2" x 4½" - B2
CENTER HUNG DOORFRAME DETAILS

KEY ELEVATION
ENTRANCE

FRAME HEIGHT
MASONRY OPENING
DLO

FRAME WIDTH
MASONRY OPENING

DOOR OPENING

1 CF451-13
2 CF450-34
3 CF451-33
4 CF450-34

1" Insulated Glass

CD100-2

Optional Weathering

CF450-17T

CF451-34

CF451-33
WIND LOAD CHARTS
(Assumes Total Lateral Support of flanges)

EXAMPLE ELEVATION

H = Mullion Height
W = Mullion Spacing

Curves are based on deflection limited to L/175 not to exceed 1" and total lateral support of flanges.
WIND LOAD CHARTS
(Assumes Total Lateral Support of flanges)

EXAMPLE ELEVATION

\[ H = \text{Mullion Height} \]
\[ W = \text{Mullion Spacing (Center of Light to Center of Light)} \]

Curves are based on deflection limited to L/175 not to exceed 1” and total lateral support of flanges.
WIND LOAD CHARTS
(Assumes Total Lateral Support of flanges)

EXAMPLE ELEVATION

H = Mullion Height
W = Mullion Spacing (Center of Light to Center of Light)

Curves are based on deflection limited to L/175 not to exceed 1" and total lateral support of flanges.
WIND LOAD CHARTS
(Assumes Total Lateral Support of flanges)

EXAMPLE ELEVATION

H = Mullion Height
W = Mullion Spacing (Center of Light to Center of Light)

CF451 @ 50 PSF

Curves are based on deflection limited to L/175 not to exceed 1” and total lateral support of flanges.
WIND LOAD CHARTS

EXAMPLE ELEVATION

H = Mullion Height
W = Mullion Spacing
SP = Maximum Horizontal Space (Largest Space between Horizontals)

These charts are designed to help with the selection of a mullion for storefront applications given the height (H) of the opening, the width (W) of the mullion spacing and the maximum spacing (SP) of the horizontals.

This mullion is acceptable if the horizontal mullions do not exceed spacing (SP) based on AA Specification for Aluminum Structures, 2010.
This mullion is acceptable if the horizontal mullions do not exceed spacing (SP) based on AA Specification for Aluminum Structures, 2010.

EXAMPLE ELEVATION

\[ H = \text{Mullion Height} \]
\[ W = \text{Mullion Spacing} \]
\[ SP = \text{Maximum Horizontal Space (Largest Space between Horizontals)} \]

These charts are designed to help with the selection of a mullion for storefront applications given the height (H) of the opening, the width (W) of the mullion spacing and the maximum spacing (SP) of the horizontals.
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This mullion is acceptable if the horizontal mullions do not exceed spacing (SP) based on AA Specification for Aluminum Structures, 2010.
**WIND LOAD CHARTS**

**EXAMPLE ELEVATION**

- **H** = Mullion Height
- **W** = Mullion Spacing
- **SP** = Maximum Horizontal Space (Largest Space between Horizontals)

This mullion is acceptable if the horizontal mullions do not exceed spacing (SP) based on AA Specification for Aluminum Structures, 2010.

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This mullion is acceptable if the horizontal mullions do not exceed spacing (SP) based on AA Specification for Aluminum Structures, 2010.

EXAMPLE ELEVATION

H = Mullion Height
W = Mullion Spacing
SP = Maximum Horizontal Space (Largest Space between Horizontals)

CF451-7T/CF451-8T @ 20 PSF

These charts are designed to help with the selection of a mullion for storefront applications given the height (H) of the opening, the width (W) of the mullion spacing and the maximum spacing (SP) of the horizontals.
WIND LOAD CHARTS

EXAMPLE ELEVATION

H = Mullion Height
W = Mullion Spacing
SP = Maximum Horizontal Space (Largest Space between Horizontals)

These charts are designed to help with the selection of a mullion for storefront applications given the height (H) of the opening, the width (W) of the mullion spacing and the maximum spacing (SP) of the horizontals.

This mullion is acceptable if the horizontal mullions do not exceed spacing (SP) based on AA Specification for Aluminum Structures, 2010.
These charts are designed to help with the selection of a mullion for storefront applications given the height (H) of the opening, the width (W) of the mullion spacing and the maximum spacing (SP) of the horizontals.

This mullion is acceptable if the horizontal mullions do not exceed spacing (SP) based on AA Specification for Aluminum Structures, 2010.

EXAMPLE ELEVATION

\( H = \) Mullion Height
\( W = \) Mullion Spacing
\( SP = \) Maximum Horizontal Space (Largest Space between Horizontals)
These charts are designed to help with the selection of a mullion for storefront applications given the height (H) of the opening, the width (W) of the mullion spacing and the maximum spacing (SP) of the horizontals.

This mullion is acceptable if the horizontal mullions do not exceed spacing (SP) based on AA Specification for Aluminum Structures, 2010.
DEAD LOAD CHART

EXAMPLE ELEVATION

H = Distance between Horizontals
W = Mullion Spacing
x = Location of setting blocks as a fraction of W

NOTE: Curves are based on deflection limited to 1/8”.

CF451-2T with 1” Glass

These charts are designed to help with the selection of a mullion for storefront applications given the height (H) of the glass and the width (W) of the mullion spacing.
SECTION 08410 ALUMINUM ENTRANCES AND STOREFRONT SYSTEMS

This suggested guide specification has been developed using the current edition of the Construction Specifications Institute (CSI) “Manual of Practice,” including the recommendations for the CSI 3 Part Section Format and the CSI Page Format. The developmental concept and organizational arrangement used by the American Institute of Architects (AIA) MASTERSPEC Program were recognized in the preparation of this guide specification. Neither CSI nor AIA endorse specific manufacturers and products. The preparation of the guide specification assumes the use of standard contract documents and forms, including the “Conditions of the Contract,” published by the AIA.

PART 1 – GENERAL

1.01 Summary
A. Section Includes: Architectural Aluminum Products by CARDINAL COMMERCIAL PRODUCTS, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of storefront framing.
1. Types of Architectural Aluminum Products by CARDINAL COMMERCIAL PRODUCTS include:
   a. CF451T: 2” x 4-1/2” (outside) or (inside) center glazed thermal storefront system for 1” insulated glazing.

EDITOR NOTE: BELOW RELATED SECTIONS ARE SPECIFIED ELSE WHERE, HOWEVER, CARDINAL COMMERCIAL PRODUCTS RECOMMENDS SINGLE SOURCE RESPONSIBILITY FOR ALL OF THESE SECTIONS AS INDICATED IN 2.07 SOURCE QUALITY CONTROL.

B. Related Sections:
1. Division 7 Section “Vapor Barriers” between glazed wall systems and adjacent construction
2. Division 7 Section “Fire Stopping”
3. Division 7 Section “Joint Sealants” for joint sealants installed as part of aluminum entrance and storefront system
4. Division 8 Section “Glazed Aluminum Curtain Walls”
5. Division 8 Section “Aluminum Windows Walls”
6. Division 8 Section “Aluminum Entrances and Storefronts”
7. Division 8 Section “Aluminum Mall Sliding Doors”
8. Division 8 Section “Finish Hardware”
9. Division 8 Section “Glass and Glazing”

EDITOR NOTE: REFER TO INDEX FOR ANY AND ALL APPLICABLE STANDARDS.

1.02 References (Industry Standards)

1.03 System Description
A. Storefront System Performance Requirements:
1. Air Infiltration: The test specimen shall be tested in accordance with ASTM 283. Air infiltration rate shall not exceed 0.06 cfm/ft² at a (static) air pressure differential of 6.24 PSF.
2. Water Resistance, (static): The test specimen shall be tested in accordance with ASTM 331 for (outside) or (inside). There shall be no leakage at a minimum static air pressure differential of 10 PSF as defined in AAMA 501.
3. Uniform Load: A static design load of 35 PSF shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member at design load. At structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

1.04 Submittals
A. General: Prepare, review, approve, and submit specified submittals in accordance with “Conditions of the Contract” and Division 1 Submittals Sections. Product data, shop drawings, samples, and similar submittals are defined in “Conditions of the Contract.”
B. Quality Assurance/Control Submittals:
1. Test Reports: Submit certified test reports showing compliance with specified performance characteristics.

1.05 Warranty
A. Project Warranty: Refer to “Conditions of the Contract” for project warranty provisions.
B. Manufacturer’s Product Warranty: Submit, for Owner’s acceptance, manufacturer’s warranty for storefront system as follows:
1. Warranty Period: Two (2) years from Date of Substantial Completion of the project. The Limited Warranty shall begin in no event later than six months from date of shipment by CARDINAL COMMERCIAL PRODUCTS without regard to the date selected as substantial completion. In addition, entrance door corner construction shall be supported with a lifetime warranty for the life of the door under normal use.

1.06 Quality Assurance
A. Qualifications:
1. Installer Qualifications: Installer experienced (as determined by contractor) to perform work of this section who has specialized in the installation of work similar to that required for this project and who is acceptable to product manufacturer.
2. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction, approving acceptable installer and approving application method.
B. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer’s installation instructions, and manufacturer’s warranty requirements.
1.07 Delivery, Storage, and Handling
   A. Ordering: Comply with manufacturer’s ordering instructions and scheduling requirements to avoid construction delays.
   B. Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.
   C. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

PART 2 – PRODUCTS

EDITOR NOTE: RETAIN BELOW ARTICLE FOR PROPRIETARY METHOD SPECIFICATION; ADD PRODUCT ATTRIBUTES, PERFORMANCE CHARACTERISTICS, MATERIAL STANDARDS, AND DESCRIPTIONS AS APPLICABLE. DO NOT USE THE PHRASE “OR EQUAL” / “OR APPROVED EQUAL,” OR SIMILAR PHRASES, USE OF SUCH PHRASES CAN CAUSE AMBIGUITY IN THE SPECIFICATIONS DUE TO THE DIFFERENT INTERPRETATIONS AMONG THE DIVERGENT PARTIES OF THE CONSTRUCTION PROCESS AND READERS OF THESE SPECIFICATIONS. SUCH PHRASES REQUIRE EXTENSIVE AND COMPLETE REQUIREMENTS (PROCEDURAL, LEGAL, REGULATORY, AND RESPONSIBILITY) FOR DETERMINING “OR EQUAL.”

2.01 Manufacturers (Acceptable Manufacturers/Products)
   A. Acceptable Manufacturers:
      1. Address:
         Cardinal Commercial Products, LLC
         4915 Heller Street
         Louisville, KY 40218
      Contact Numbers:
         a. Telephone: 502-969-4059
         b. Fax: 502-813-2484
         c. Email: ccpinfo@cardcompro.com
         d. Web address: cardcompro.com
      2. Proprietary Product(s)/System(s): CARDINAL COMMERCIAL PRODUCTS
         a. Series: CF451T Thermal Storefront System

EDITOR NOTE: RETAIN BELOW FOR ALTERNATE MANUFACTURERS/PRODUCTS AS SPECIFIED IN THE CONTRACT DOCUMENTS, COORDINATE BELOW WITH BID DOCUMENTS (IF ANY), AND DIVISION 1 ALTERNATES SECTION. CONSULT WITH CARDINAL COMMERCIAL PRODUCTS FOR RECOMMENDATIONS ON ALTERNATE MANUFACTURERS AND PRODUCTS MEETING THE DESIGN CRITERIA AND PROJECT REQUIREMENTS. CARDINAL COMMERCIAL PRODUCTS RECOMMENDS OTHER MANUFACTURERS REQUESTING APPROVAL TO BID THEIR PRODUCT AS AN EQUAL, MUST SUBMIT THEIR REQUEST IN WRITING (10) DAYS PRIOR TO CLOSE OF BIDDING.

   b. Finish/Color: (See 2.06 Finishes)
   c. Framing Member Profile: 2” x 4-1/2” nominal dimension; Center Glazed; Screw Spline Fabrication
      *Provide combination full height subsill receptor and sill section which eliminate blind seal conditions at fasteners penetrating subsill receptor. Subsill receptor to have full height end dams and weep holes backed with baffles to reduce air infiltration.*

   B. Alternate (Manufacturers/Products): In lieu of providing below specified base bid/contract manufacturer, provide below specified alternate manufacturers. Refer to Division 1 Alternates Section.
      1. Base Bid/Contract Manufacturer/Product: CARDINAL COMMERCIAL PRODUCTS
         a. Product: Aluminum Storefront System
         b. Series CF451T Thermal Storefront System: 2” x 4-1/2” nominal dimension, Center Glazed; Screw-Spline Fabrication
      2. Alternate #____ Manufacturer/Product:
         a. Product:
         b. Series:
         c. Framing Member Profile:
      3. Alternate #____ Manufacturer/Product:
         a. Product:
         b. Series:
         c. Framing Member Profile:

C. Substitutions:
   1. General: Refer to Division 1 Substitutions for procedures and submission requirements.
      a. Pre-Contract (Bidding Period) Substitutions: Submit written requests ten (10) days prior to bid date.
      b. Post-Contract (Construction Period) Substitutions: Submit written request in order to avoid storefront installation and construction delays.
   2. Substitution Documentation
      a. Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
      b. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for storefront system performance criteria.
   3. Test Reports: Submit test reports verifying compliance with each test requirement for storefront required by the project.
   4. Product Sample and Finish: Submit product sample, representative of storefront for the project, with specified finish and color.
   3. Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.
GUIDE SPECIFICATIONS (Continued)

2.02 Materials
A. Aluminum (Storefront and Components):
   2. Member Wall Thickness: Each framing member shall have a wall thickness sufficient to meet the specified structural requirements.
   3. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront framing members are nominal and in compliance with AA Aluminum Standards and Data.

2.03 Accessories
A. Fasteners: Where exposed, shall be Stainless Steel.
B. Gaskets: Glazing gaskets shall comply with ASTM C 864 and be extruded of silicone compatible EPDM rubber that provides for silicone adhesion.
C. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

2.04 Related Materials
A. Sealants: Refer to Joint Treatment (Sealants) Section.
B. Glass: Refer to Glass and Glazing Section.

2.05 Fabrication
A. General:
   1. Fabricate components per manufacturer’s installation instructions and with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
   2. Accurately fit and secure joints and corners. Make joints flush, hairline and weatherproof.
   3. Arrange fasteners and attachments to conceal from view.

EDITOR NOTE: SELECT BELOW FINISH AND COLOR FROM CARDINAL COMMERCIAL PRODUCTS’S STANDARD COLORS. CUSTOM COLORS ARE AVAILABLE UPON REQUEST FROM CARDINAL COMMERCIAL PRODUCTS. OTHER POLYESTER POWDER COATINGS CONFORMING TO AAMA 2604 ARE AVAILABLE. CONSULT WITH YOUR CARDINAL COMMERCIAL PRODUCTS REPRESENTATIVE FOR OTHER SURFACE TREATMENTS AND FINISHES.

2.06 Finishes
A. Shop Finishing
   2. Clear Anodizing Conforming to AA-M12C22A31, AAMA 611, Architectural. Class. II. Clear Anodic Coating (Clear: #11 (Standard)
   3. AAMA 2605, Fluoropolymer Powder Coating (Color: __________).
   4. AAMA 2604, Polyester Powder Coating. (Color: __________).
   5. Other: Manufacturer __________ Type __________ Color: __________.

2.07 Source Quality Control
A. Source Quality: Provide aluminum storefront specified herein from a single source.
   1. Building Enclosure System: When aluminum curtain wall are part of a building enclosure system, including entrances, entrance hardware, windows, curtain wall framing and related products, provide building enclosure system products from a single source manufacturer.

PART 3 – EXECUTION

3.01 Examination
A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer’s instructions. Verify openings are sized to receive specified system and sill plate is level in accordance with manufacturer’s acceptable tolerances.

EDITOR NOTE: COORDINATE BELOW ARTICLE WITH MANUFACTURER’S RECOMMENDED INSTALLATION DETAILS AND INSTALLATION INSTRUCTIONS.

   1. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

3.02 Installation
A. General: Install storefront systems plumb, level, and true to line, without warp or rack of frames with manufacturer’s prescribed tolerances and installation instructions. Provide support and anchor in place.
   1. Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
   2. Glazing: Glass shall be (outside) or (inside) glazed and held in place with extruded EPDM glazing gaskets on both sides of the glass.
   3. Water Drainage: Water deflectors shall be installed at each end of intermediate horizontal allowing infiltrated water to drain down the vertical member’s glazing pocket into a full height subsill receptor where it weeps to the exterior through a series of weep holes backed with baffles to reduce air infiltration.
B. Related Products Installation Requirements:
   1. Sealants (Perimeter): Refer to Division 7 Joint Treatment (Sealants) Section.
   2. Glass: Refer to Division 8 Glass and Glazing Section.
GUIDE SPECIFICATIONS
(Continued)

3.03 Field Quality Control
A. Field Tests: Architect shall select storefront units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer’s representative present. Tests not meeting specified performance requirements and units having deficiencies must be corrected as part of the contract amount.
   1. Testing: Testing shall be performed per AAMA 503 by a qualified independent testing agency. Refer to Division Testing Section for payment of testing and testing requirements.
      a. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft², which, ever is greater.
      b. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 8 PSF.
B. Manufacturer’s Field Services: Upon Owner’s request, provide manufacturer’s field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer’s instructions.

3.04 Protection and Cleaning
A. Protection: Protect installed product’s finish surfaces from damage during construction. Protect aluminum storefront system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.
B. Cleaning: Repair or replace damaged installed products. Installed products are to be cleaned in accordance with manufacturer’s instructions prior to owner’s acceptance. Remove construction debris from project site and legally dispose of debris.

DISCLAIMER STATEMENT
This guide specification is intended for use by a qualified construction specifier. The guide specification is not intended to be verbatim as a project specification without appropriate modifications for the specific use intended. The guide specification must be used and coordinated with the procedures of each design firm, and the particular requirements of a specific construction project.

END OF SECTION 08410
SERIES CF451T 2” x 4½” - B2

CORNER DETAILS

KEY ELEVATION

OTHER COMBINATIONS

NO POCKETS (Post)
ONE POCKET (Terminating End)
TWO POCKETS (Straight Wall)
THREE POCKETS (Intersecting Walls)
FOUR POCKETS (Intersecting Walls)

COLUMN COVERS

Formed Aluminum Trim

Aluminum Trim
SERIES CF451T 2” x 41/2” - B2

VERTICAL OFFSET PIVOT HUNG DOORFRAME DETAILS

KEY ELEVATION

ENTRANCE

1
CF451-4  CF451-30
GSK-1 (Typ)
D.L.O. 2” D.L.O.
FRAME WIDTH FRAME WIDTH
MASSORY OPENING MASSORY OPENING

2
CF451-4  CF451-30
D.L.O. 2”
FRAME WIDTH
MASSORY OPENING

3
CF451-30 T450
CF200-8
GSK-1 (Typ)
D.L.O. 2” DOOR OPENING
FRAME WIDTH
MASSORY OPENING

4
CF451-30 CF200-8
CF450-17
D.L.O. 2” DOOR OPENING
FRAME WIDTH
MASSORY OPENING

5
T450
CF200-6-1
DOOR OPENING

3A
For Offset Pivot Doorframe Requiring Steel Reinforcement

CD100-2
1” Insulated Glass

STL-2
Steel Reinforcement

For Offset Pivot Doorframe Requiring Steel Reinforcement
SERIES CF451T 2” x 4 1/2” - B2

VERTICAL OFFSET BUTT HUNG DOORFRAME DETAILS

KEY ELEVATION

ENTRANCE
SERIES CF451T 2" x 4 1/2" - B2

BUTT GLAZED FRAMING with OFFSET PIVOT HUNG ENTRANCE DETAILS

BUTT GLAZING NOTE:
- Glass thickness at side lights = 1/2"
- Glass bite at side lights = 1/2"
- 1/2" Glass shown with CF451 framing,
  1" Insulated Glass with CF451T framing
  is similar.
- Use GSK-1 gasket
WIND LOAD CHARTS
(Assumes Total Lateral Support of flanges)

EXAMPLE ELEVATION

\[ H \] = Mullion Height
\[ W \] = Mullion Spacing

Curves are based on deflection limited to L/175 not to exceed 1" and total lateral support of flanges.
WIND LOAD CHARTS
(Assumes Total Lateral Support of flanges)

EXAMPLE ELEVATION

H = Mullion Height
W = Mullion Spacing

Curves are based on deflection limited to L/175 not to exceed 1" and total lateral support of flanges.
WIND LOAD CHARTS
(Assumes Total Lateral Support of flanges)

Example Elevation

\[ H = \text{Mullion Height} \]
\[ W = \text{Mullion Spacing} \]

Curves are based on deflection limited to L/175 not to exceed 1” and total lateral support of flanges.
WIND LOAD CHARTS
(Assumes Total Lateral Support of flanges)

EXAMPLE ELEVATION

- H = Mullion Height
- W = Mullion Spacing

Curves are based on deflection limited to L/175 not to exceed 1” and total lateral support of flanges.
These charts are designed to help with the selection of a mullion for storefront applications given the height (H) of the opening, the width (W) of the mullion spacing and the maximum spacing (SP) of the horizontals.

This mullion is acceptable if the horizontal mullions do not exceed spacing (SP) based on AA Specification for Aluminum Structures, 2010.
These charts are designed to help with the selection of a mullion for storefront applications given the height (H) of the opening, the width (W) of the mullion spacing and the maximum spacing (SP) of the horizontals.
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EXAMPLE ELEVATION

- **H** = Mullion Height
- **W** = Mullion Spacing
- **SP** = Maximum Horizontal Space (Largest Space between Horizontals)

These charts are designed to help with the selection of a mullion for storefront applications given the height (H) of the opening, the width (W) of the mullion spacing and the maximum spacing (SP) of the horizontals.
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EXAMPLE ELEVATION

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**EXAMPLE ELEVATION**

- **H** = Mullion Height
- **W** = Mullion Spacing
- **SP** = Maximum Horizontal Space (Largest Space between Horizontals)

**CHART DETAILS**
- **CF451-7/CF451-8 @ 30 PSF**
- **Mullion Spacing in (Inches)**
- **Mullion Height in (Inches)**
- SP = 24"
- SP = 48"
- SP = 60"
- SP = 72"
- SP = 96"
- SP = 120"

This mullion is acceptable if the horizontal mullions do not exceed spacing (SP) based on AA Specification for Aluminum Structures, 2010.
These charts are designed to help with the selection of a mullion for storefront applications given the height (H) of the opening, the width (W) of the mullion spacing and the maximum spacing (SP) of the horizontals.
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This mullion is acceptable if the horizontal mullions do not exceed spacing (SP) based on AA Specification for Aluminum Structures, 2010.
EXAMPLE ELEVATION

H = Distance between Horizontals
W = Mullion Spacing
x = Location of setting blocks as a fraction of W

NOTE: Curves are based on deflection limited to 1/8".

These charts are designed to help with the selection of a mullion for storefront applications given the height (H) of the glass and the width (W) of the mullion spacing.
SECTION 08410 ALUMINUM ENTRANCES AND STOREFRONT SYSTEMS

This suggested guide specification has been developed using the current edition of the Construction Specifications Institute (CSI) “Manual of Practice,” including the recommendations for the CSI 3 Part Section Format and the CSI Page Format. The developmental concept and organizational arrangement used by the American Institute of Architects (AIA) MASTERSPEC Program were recognized in the preparation of this guide specification. Neither CSI nor AIA endorse specific manufacturers and products. The preparation of the guide specification assumes the use of standard contract documents and forms, including the “Conditions of the Contract,” published by the AIA.

PART 1 – GENERAL

1.01 Summary
A. Section Includes: Architectural Aluminum Products by CARDINAL COMMERCIAL PRODUCTS, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of storefront framing.
1. Types of Architectural Aluminum Products by CARDINAL COMMERCIAL PRODUCTS include:
a. CF451: 2” x 4-1/2” (outside) or (inside) center glazed storefront system for 1” insulated glazing.

EDITOR NOTE: BELOW RELATED SECTIONS ARE SPECIFIED ELSE WHERE, HOWEVER, CARDINAL COMMERCIAL PRODUCTS RECOMMENDS SINGLE SOURCE RESPONSIBILITY FOR ALL OF THESE SECTIONS AS INDICATED IN 2.07 SOURCE QUALITY CONTROL.

B. Related Sections:
1. Division 7 Section “Vapor Barriers” between glazed wall systems and adjacent construction
2. Division 7 Section “Fire Stopping”
3. Division 7 Section “Joint Sealants” for joint sealants installed as part of aluminum entrance and storefront system
4. Division 8 Section “Glazed Aluminum Curtain Walls”
5. Division 8 Section “Aluminum Windows Walls”
6. Division 8 Section “Aluminum Entrances and Storefronts”
7. Division 8 Section “Aluminum Mall Sliding Doors”
8. Division 8 Section “Finish Hardware”
9. Division 8 Section “Glass and Glazing”

EDITOR NOTE: REFER TO INDEX FOR ANY AND ALL APPLICABLE STANDARDS.

1.02 References (Industry Standards)

1.03 System Description
A. Storefront System Performance Requirements:
1. Air Infiltration: The test specimen shall be tested in accordance with ASTM 283. Air infiltration rate shall not exceed 0.06 cfm/ft2 at a (static) air pressure differential of 6.24 PSF.
2. Water Resistance, (static): The test specimen shall be tested in accordance with ASTM 331 for (outside) or (inside). There shall be no leakage at a minimum static air pressure differential of 10 PSF as defined in AAMA 501.
3. Uniform Load: A static air design load of 35 PSF shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member at design load. At structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

1.04 Submittals
A. General: Prepare, review, approve, and submit specified submittals in accordance with “Conditions of the Contract” and Division 1 Submittals Sections. Product data, shop drawings, samples, and similar submittals are defined in “Conditions of the Contract.”
B. Quality Assurance/Control Submittals:
1. Test Reports: Submit certified test reports showing compliance with specified performance characteristics.

1.05 Warranty
A. Project Warranty: Refer to “Conditions of the Contract” for project warranty provisions.
B. Manufacturer’s Product Warranty: Submit, for Owner’s acceptance, manufacturer’s warranty for storefront system as follows:
1. Warranty Period: Two (2) years from Date of Substantial Completion of the project. The Limited Warranty shall begin in no event later than six months from date of shipment by CARDINAL COMMERCIAL PRODUCTS without regard to the date selected as substantial completion. In addition, entrance door corner construction shall be supported with a lifetime warranty for the life of the door under normal use.

1.06 Quality Assurance
A. Qualifications:
1. Installer Qualifications: Installer experienced (as determined by contractor) to perform work of this section who has specialized in the installation of work similar to that required for this project and who is acceptable to product manufacturer.
2. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction, approving acceptable installer and approving application method.
B. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer’s installation instructions, and manufacturer’s warranty requirements.
GUIDE SPECIFICATIONS
(Continued)

1.07 Delivery, Storage, and Handling
A. Ordering: Comply with manufacturer’s ordering instructions and scheduling requirements to avoid construction delays.
B. Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.
C. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

PART 2 – PRODUCTS

EDITOR NOTE: RETAIN BELOW ARTICLE FOR PROPRIETARY METHOD SPECIFICATION; ADD PRODUCT ATTRIBUTES, PERFORMANCE CHARACTERISTICS, MATERIAL STANDARDS, AND DESCRIPTIONS AS APPLICABLE. DO NOT USE THE PHRASE “OR EQUAL” / “OR APPROVED EQUAL,” OR SIMILAR PHRASES, USE OF SUCH PHRASES CAN CAUSE AMBIGUITY IN THE SPECIFICATIONS DUE TO THE DIFFERENT INTERPRETATIONS AMONG THE DIVERGENT PARTIES OF THE CONSTRUCTION PROCESS AND READERS OF THESE SPECIFICATIONS. SUCH PHRASES REQUIRE EXTENSIVE AND COMPLETE REQUIREMENTS (PROCEDURAL, LEGAL, REGULATORY, AND RESPONSIBILITY) FOR DETERMINING “OR EQUAL.”

2.01 Manufacturers (Acceptable Manufacturers/Products)
A. Acceptable Manufacturers:
   1. Address:
      Cardinal Commercial Products, LLC
      4915 Heller Street
      Louisville, KY 40218
   Contact Numbers:
   a. Telephone: 502-969-4059
   b. Fax: 502-813-2484
   c. Email: ccpinfo@cardcompro.com
   d. Web address: cardcompro.com
   2. Proprietary Product(s)/System(s): CARDINAL COMMERCIAL PRODUCTS
      a. Series: CF451 Storefront System

EDITOR NOTE: RETAIN BELOW FOR ALTERNATE MANUFACTURERS/PRODUCTS AS SPECIFIED IN THE CONTRACT DOCUMENTS. COORDINATE BELOW WITH BID DOCUMENTS (IF ANY), AND DIVISION 1 ALTERNATES SECTION. CONSULT WITH CARDINAL COMMERCIAL PRODUCTS FOR RECOMMENDATIONS ON ALTERNATE MANUFACTURERS AND PRODUCTS MEETING THE DESIGN CRITERIA AND PROJECT REQUIREMENTS. CARDINAL COMMERCIAL PRODUCTS RECOMMENDS OTHER MANUFACTURERS REQUESTING APPROVAL TO BID THEIR PRODUCT AS AN EQUAL, MUST SUBMIT THEIR REQUEST IN WRITING (10) DAYS PRIOR TO CLOSE OF BIDDING.

   b. Finish/Color: (See 2.06 Finishes)
   c. Framing Member Profile: 2” x 4-1/2” nominal dimension; Center Glazed; Screw Spline Fabrication
      Provide combination full height subsill receptor and sill section which eliminate blind seal conditions at fasteners penetrating subsill receptor. Subsill receptor to have full height end dams and weep holes backed with baffles to reduce air infiltration.

B. Alternate (Manufacturers/Products): In lieu of providing below specified base bid/contract manufacturer, provide below specified alternate manufacturers. Refer to Division 1 Alternates Section.
   1. Base Bid/Contract Manufacturer/Product: CARDINAL COMMERCIAL PRODUCTS
      a. Product: Aluminum Storefront System
      b. Series CF451 Storefront System: 2” x 4-1/2” nominal dimension, Center Glazed; Screw-Spline Fabrication
   2. Alternate #____ Manufacturer/Product:
      a. Product:
      b. Series:
      c. Framing Member Profile:
   3. Alternate #____ Manufacturer/Product:
      a. Product:
      b. Series:
      c. Framing Member Profile:

C. Substitutions:
   1. General: Refer to Division 1 Substitutions for procedures and submission requirements.
      a. Pre-Contract (Bidding Period) Substitutions: Submit written requests ten (10) days prior to bid date.
      b. Post-Contract (Construction Period) Substitutions: Submit written request in order to avoid storefront installation and construction delays.
   2. Substitution Documentation
      a. Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
      b. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for storefront system performance criteria.
      c. Test Reports: Submit test reports verifying compliance with each test requirement for storefront required by the project.
      d. Product Sample and Finish: Submit product sample, representative of storefront for the project, with specified finish and color.
   3. Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.
2.02 Materials
A. Aluminum (Storefront and Components):
   2. Member Wall Thickness: Each framing member shall have a wall thickness sufficient to meet the specified structural requirements.
   3. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront framing members are nominal and in compliance with AA Aluminum Standards and Data.

2.03 Accessories
A. Fasteners: Where exposed, shall be Stainless Steel.
B. Gaskets: Glazing gaskets shall comply with ASTM C 864 and be extruded of silicone compatible EPDM rubber that provides for silicone adhesion.
C. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

2.04 Related Materials
A. Sealants: Refer to Joint Treatment (Sealants) Section.
B. Glass: Refer to Glass and Glazing Section.

2.05 Fabrication
A. General:
   1. Fabricate components per manufacturer’s installation instructions and with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
   2. Accurately fit and secure joints and corners. Make joints flush, hairline and weatherproof.
   3. Arrange fasteners and attachments to conceal from view.

EDITOR NOTE: SELECT BELOW FINISH AND COLOR FROM CARDINAL COMMERCIAL PRODUCTS’S STANDARD COLORS. CUSTOM COLORS ARE AVAILABLE UPON REQUEST FROM CARDINAL COMMERCIAL PRODUCTS. OTHER POLYESTER POWDER COATINGS CONFORMING TO AAMA 2604 ARE AVAILABLE. CONSULT WITH YOUR CARDINAL COMMERCIAL PRODUCTS REPRESENTATIVE FOR OTHER SURFACE TREATMENTS AND FINISHES.

2.06 Finishes
A. Shop Finishing
   2. Clear Anodizing Conforming to AA-M12C22A31, AAMA 611, Architectural. Class. II. Clear Anodic Coating (Clear: #11 (Standard)
   3. AAMA 2605, Fluoropolymer Powder Coating (Color: ____________).
   4. AAMA 2604, Polyester Powder Coating. (Color: ____________).
   5. Other: Manufacturer __________ Type __________ Color: ____________.

2.07 Source Quality Control
A. Source Quality: Provide aluminum storefront specified herein from a single source.
   1. Building Enclosure System: When aluminum curtain wall are part of a building enclosure system, including entrances, entrance hardware, windows, curtain wall framing and related products, provide building enclosure system products from a single source manufacturer.

PART 3 – EXECUTION

3.01 Examination
A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer’s instructions. Verify openings are sized to receive specified system and sill plate is level in accordance with manufacturer’s acceptable tolerances.

EDITOR NOTE: COORDINATE BELOW ARTICLE WITH MANUFACTURER’S RECOMMENDED INSTALLATION DETAILS AND INSTALLATION INSTRUCTIONS.

   1. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

3.02 Installation
A. General: Install storefront systems plumb, level, and true to line, without warp or rack of frames with manufacturer’s prescribed tolerances and installation instructions. Provide support and anchor in place.
   1. Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
   2. Glazing: Glass shall be (outside) or (inside) glazed and held in place with extruded EPDM glazing gaskets on both sides of the glass.
   3. Water Drainage: Water deflectors shall be installed at each end of intermediate horizontal allowing infiltrated water to drain down the vertical member’s glazing pocket into a full height subsill receptor where it weeps to the exterior through a series of factory punched weep holes backed with baffles to reduce air infiltration.
B. Related Products Installation Requirements:
   1. Sealants (Perimeter): Refer to Division 7 Joint Treatment (Sealants) Section.
   2. Glass: Refer to Division 8 Glass and Glazing Section.
3.03 Field Quality Control

A. Field Tests: Architect shall select storefront units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer’s representative present. Tests not meeting specified performance requirements and units having deficiencies must be corrected as part of the contract amount.

1. Testing: Testing shall be performed per AAMA 503 by a qualified independent testing agency. Refer to Division Testing Section for payment of testing and testing requirements.
   a. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft², which, ever is greater.
   b. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 8 PSF.

B. Manufacturer’s Field Services: Upon Owner’s request, provide manufacturer’s field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer’s instructions.

3.04 Protection and Cleaning

A. Protection: Protect installed product’s finish surfaces from damage during construction. Protect aluminum storefront system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.

B. Cleaning: Repair or replace damaged installed products. Installed products are to be cleaned in accordance with manufacturer’s instructions prior to owner’s acceptance. Remove construction debris from project site and legally dispose of debris.

DISCLAIMER STATEMENT

This guide specification is intended for use by a qualified construction specifier. The guide specification is not intended to be verbatim as a project specification without appropriate modifications for the specific use intended. The guide specification must be used and coordinated with the procedures of each design firm, and the particular requirements of a specific construction project.

END OF SECTION 08410