**SECTION 08 43 13**

**ALUMINUM-FRAMED STOREFRONTS**

1. **GENERAL**
	1. **Summary**
		1. Section Includes
			1. Aluminum-framed storefront with vision glass.
			2. Aluminum doors and frames.
			3. Weatherstripping.
		2. Products Installed But Not Supplied Under This Section
			1. [Tempered] Glass: [Section 08 80 00] [Section 08 88 00]
			2. Door Hardware: Section 08 71 00
		3. Related Requirements
			1. Section 01 25 00 – Substitution Procedures
			2. Section 01 33 00 – Submittal Procedures
			3. Section 01 70 00 – Execution and Closeout Requirements
			4. Section 08 71 00 – Door Hardware
			5. Section 08 80 10 – Glazing
			6. Section 08 88 00 – Special Function Glazing
	2. References
		1. Abbreviations and Acronyms

|  |  |
| --- | --- |
| * + - 1. AC
 | Alternating Current |
| * + - 1. amp
 | Ampere |
| * + - 1. ANSI/BHMA
 | Standards and publication developed by Builders Hardware Manufacturers Association in conjunction with American National Standards Institute. |
| * + - 1. cu ft/min sq ft
 | Cubic feet per minute per square feet of area |
| * + - 1. psf
 | Pounds per square foot |
| * + - 1. V
 | Volt |
| * + - 1. Vdc
 | Volt Direct Current |

* + 1. Definitions

|  |  |
| --- | --- |
| * + - 1. ANSI/BHMA Grade 1
 | Standard defining product grade for a particular hardware item with Grade 1 being the highest. |

* + 1. Reference Standards
			1. American Architectural Manufacturers Association (AAMA) Publications:

|  |  |
| --- | --- |
| * + - * 1. 611 - 20
 | Voluntary Specification for Anodized Architectural Aluminum  |
| * + - * 1. 2605 - 20
 | Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels  |

* + - 1. American National Standards Institute (ANSI) Publications:

|  |  |
| --- | --- |
| * + - * 1. A156.13 - 17
 | Mortise Locks and Latches |
| * + - * 1. Z49.1 – 21
 | Safety in Welding, Cutting, and Allied Processes |

* + - 1. American Welding Society (AWS) Publications:

|  |  |
| --- | --- |
| * + - * 1. Handbook
 | Welding Handbook, 10th Edition, Volume 1 – Welding and Cutting Science and Technology |

* + - 1. ASTM International (ASTM) Publications:

|  |  |
| --- | --- |
| * + - * 1. E283/E283M – 19
 | Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen |
| * + - * 1. E330/E33OM – 14 (21)
 | Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference |
| * + - * 1. E331 – 00 (16)
 | Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference |

* 1. **Submittals**
		1. Section 01 33 00
	2. **Action Submittals**
		1. Product Data
			1. Manufacturer’s technical product data including:
				1. [Door hardware,] [automatic in-ground operators,] components, and accessories.
				2. Product component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details.
				3. Standard details and fabrication method.

Include fabrication details, material description, dimensions of individual components and profiles, and finishes.

* + - * 1. Test data: Fabricated door.
		1. Shop Drawings
			1. Dimensioned drawings of systems indicating:
				1. Plans, elevations, and sections.

Elevation-Scale: ¼ inch per foot

* + - * 1. Details and Isometric Drawings.
				2. Door Hardware: Locations, mounting heights, quantities, and installation requirements.
				3. Frames Openings: Requirements and tolerances.
				4. Affected related work, attachment requirements to meet IBC wind load requirements, expansion and contraction joint location and details, and field welding required.
		1. Hardware Schedule: Itemize each item of hardware for each door, cross-referenced to door identification numbers.
		2. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
		3. Samples
			1. Manufacturer’s finishes on exposed areas for each color and type finish:
				1. Metal Fittings and Components.
				2. Provide 3 samples of each.
		4. Entrance Door Hardware Schedule
			1. Prepared by Supplier:
				1. Detail fabrication and assembly of hardware.
				2. Detail procedures and diagrams.
			2. Coordinate and verify:
				1. Components, assemblies and related work.
				2. Proper size, thickness, hand, function and finish.
		5. Manufacturers’ Written Instructions
			1. Site Storage
			2. Installation
			3. Cleaning
	1. **Closeout Submittals**
		1. Warranty Documentation
			1. Manufacturer’s Product Warranty
				1. Forms completed in Owner’s name and registered with manufacturer.
		2. Record Documentation
		3. Section 01 70 00
	2. **Quality Assurance**
		1. Certifications
			1. Supervisor and Installers:
				1. Evidence of completed installations similar in design and extent to those required for this project.
				2. Installation work has a record of successful in-service performance.
				3. Minimum Experience: 3 years
		2. Manufacturer’s Certificate
			1. Certify products supplied meet or exceed requirements.
		3. Mock-ups
			1. Prepare mock-up for approval by Architect.
			2. Mock-up will serve as a standard for installation.
	3. **Delivery, Storage and Handling**
		1. Delivery and Acceptance Requirements
			1. Protect materials and components against damage during transit.
			2. Deliver in Manufacturer’s original, unopened, undamaged containers with identification labels intact.
			3. Upon delivery, inspect for damage.
				1. Repair of minor defects and damage subject to Architect’s approval.
				2. Remove damaged and unacceptable parts and replace with new.
		2. Storage and Protection
			1. Store materials to protect from exposure to harmful weather conditions and damage from elements, construction activities, and hazards before, during and after installation.
		3. Handling
			1. Avoid damaging materials and components during handling.
	4. **Site Conditions**
		1. Field Measurements
			1. Take field measurements before fabrication.
				1. Verify actual measurements or openings, and record measurements on shop drawings.
				2. Coordinate fabrication tolerances to insure proper fit.
			2. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.
	5. **Warranty**
		1. Manufacturer Warranty: 2 years
			1. Repair or replace components of components that fail in materials or workmanship within the specified warranty period.
		2. Section 01 70 00
1. **PRODUCTS**
	1. **Manufacturers**
		1. Acceptable Manufacturer
			1. FHC- Frameless Hardware Company

Contact: Daniel Duran

Phone: 888-295-4531

Fax: 323-336-8307

Email: FHCAluminum@fhc-usa.com

Website: www.fhc-usa.com

* + - 1. Substitutions: Not permitted.
	1. **Performance/Design Criteria**
		1. Wind Loads
			1. General:
				1. Withstand loads without damage or permanent set:

Design Wind Load: 1.5 times

Duration: 10 second of maximum load

* + - * 1. ASTM E330/E330M
			1. Design Wind Loads:
				1. Comply with IBC.
			2. Member Deflection:
				1. Limited to flexure limit of glass in any direction with full recovery of glazing materials.
		1. Water Penetration Resistance
			1. No uncontrolled water on interior face.
			2. Pressure Differential:
				1. 8 psf
				2. ASTM E331
		2. Air Leakage
			1. 0.06 cu ft/min sq ft of wall area.
			2. Pressure Differential across assembly:
				1. 6.27 psf, maximum
				2. ASTM E283
		3. Basis of Design
			1. Frameless Hardware Company LLC, FHC Aluminum™ Doors and Entrance System used for establishing quality, performance, appearance, including layout, material, attachment method and ease of installation.
				1. Sizes, profiles and dimensions are based on specific types and models, support and express the design concept. For minor deviations in dimensions and profiles, submit a Substitution Request. (Section 01 25 00)
	1. **System Components**
		1. Storefront
			1. Center-Glazed Screw Spline Assembly:
				1. [Glass: ¼ inch

1¾ inches by 4½ inches]

* + - * 1. [Glass: 1 inch

2 inches by 4½ inches]

***\*\*\*\*\*(OR)\*\*\*\*\****

* + - 1. Thermal Center-Glazed Screw Spline Assembly:
				1. [Glass: 1 inch

2 inches by 4½ inches]

* + - 1. Material:
				1. Aluminum
				2. EPDM gaskets
			2. Finish:
				1. [Class I clear anodized]
				2. [Class I bronzed anodized]
				3. [Custom – Powder Coated:

Color: \_\_\_\_\_\_\_ ]

* + 1. Door
			1. Top Rail and Vertical Stiles
				1. [Model: 200 Narrow Stile Door

Stile: 2-1/8 inches]

* + - * 1. [Model: 300 Medium Stile Door

Stile: 3¾ inches]

* + - * 1. [Model: 500 Wide Stile Door

Stile: 5 inches]

* + - 1. Bottom Rail
				1. [Standard] [10 inches]

***\*\*\*\*\*(OR)\*\*\*\*\****

* + - 1. [Model: 200 Narrow Stile Door
				1. 2-1/8 inches]
			2. [Model: 300 Medium Stile Door
				1. 3¾ inches]
			3. [Model: 500 Wide Stile Door
				1. 5 inches]
			4. Top Rail
				1. [Standard]
				2. [ \_\_\_\_\_\_\_ ]
			5. Bottom Rail
				1. [Standard] [10 inches]
			6. Finish:
				1. [Class I clear anodized]
				2. [Class I bronzed anodized]
				3. [Custom – Powder Coated:

Color: \_\_\_\_\_\_\_ ]

* + 1. Door Frame
			1. Profile: [1¾ inches by 4½ inches] [2 inches by 4½ inches]
			2. Finish:
				1. [Class I clear anodized]
				2. [Class I bronzed anodized]
				3. [Custom – Powder Coated:

Color: \_\_\_\_\_\_\_ ]

* + 1. Door Hardware
			1. Door Closers and Accessories
				1. Door Stops

Wall Mounted:

Heavy-Duty with Hook and Holder

Length: 3-9/16 inches

Finish: [Satin Chrome] [Dark Bronze]

Concave Type

Rubber Bumper

Finish: [Satin Chrome] [Dark Bronze]

Floor Mounted:

Heavy-Duty Door Stop [with Hook and Holder]

Height: 3-1/8 inches

Finish: [Satin Chrome] [Dark Bronze]

High Profile

Height: 1¾ inches

Dome Height: 3/8”

Vinyl Insert

Finish: [Satin Chrome] [Dark Bronze]

Low Profile

Height: 1 inch

Dome Height: 3/32”

Vinyl Insert

Finish: [Satin Chrome] [Dark Bronze]

* + - * 1. Overhead Concealed Door Closers

Arm Block

Side Load

Use with Overhead Concealed Closers

End Load Mounting

Use with Overhead Concealed Closer Spindle

Arm Assembly

Offset

Surface Mount Type Slide Track

Rail Depth: 9/16 inch

Top Center-Hung

Type: [PT] [K]

End Load

Standard Arm/Parallel Bracket

Delayed Action

Adjustable Spring

Surface Mount

Adjustable Spring

Standard Arm/Parallel Bracket

Finish: [Aluminum] [Dark Bronze Anodized]

Fixed Spring

Standard Arm/Parallel Bracket

Finish: [Aluminum] [Black] [Dark Bronze Anodized]

* + - 1. Hinging Hardware and Accessories
				1. Ball Bearing Hinge

Standard Weight

Size: [4 inches by 4½ inches] [5 inches by 4½ inches]

Corners: Square

Heavy-Duty Hinge

Size: [4 inches by 4½ inches]

Corners: Radius

Finish: [Aluminum] [Dark Bronze]

* + - * 1. Spring Hinge

Heavy-Duty Hinge

Size: 4 inches by 4 inches

Corners: Radius

Finish: [Chrome] [Dark Bronze] [Dull Nickel]

* + - * 1. Offset Door Closer

 Floor Mounted

Bottom Arm

Size: ¾ inch

Top Pivot

Full Mortise

Size: ¾ inch

Intermediate Pivot

Size: ¾ inch

Finish: [Polished Chrome] [Satin Chrome] [Dark Bronze]

* + - * 1. Cover Plate

Side Load Arm

* + - 1. Commercial Door Handles and Levers
				1. Sign

[Pull] [Push] [Pull and Push]

Lettering: Black

Backing: Adhesive

* + - * 1. Pull Handle

Push: 36 inches

Pull:: 10 inches offset

Finish: [Aluminum] [Dark Bronze]

* + - * 1. Mortise Hardware

Lever Lock

Heavy-Duty

Door Thickness: 1¾ inches

ANSI A156.13/Grade 1

Finish: [Brushed Stainless] [Dark Bronze]

Cylinder Guard

Finish: [Aluminum] [Dark Bronze]

Dummy Cylinder

Finish: [Aluminum] [Dark Bronze]

* + - * 1. Offset Flush Bolt

Use: Locking Inactive Door

Size: [3/16 inch] [1/4 inch] [1/8 inch]

Backset: 7/8 inch

Throw: 5/8 inch

Finish: [Aluminum] [Dark Bronze]

* + - * 1. Lock Indicator Set

Use:

On Aluminum Glass Doors

With Deadlocks and Deadbolts

Indication:

“Closed” when locked.

“Open” when unlocked.

Finish: [Aluminum] [Dark Bronze]

* + - * 1. Cylinder Rings

[Straight]

Size: [0.157 inch] [0.197 inch] [0.256 inch]

[Flared]

Size: [0.157 inch] [0.197 inch]

Finish: [Aluminum] [Dark Bronze]

* + - 1. Exit Devices and Accessories
				1. Push Plates

Size: [4 inches by 16 inches] [3 inches by 15 inches]

Finish: [Brushed Stainless] [Satin Anodized] [Dark Bronze]

* + - * 1. Kick Plates

Size: [6 inches by 34 inches] [8 inches by 30 inches] [8 inches by 32 inches] [8 inches by 34 inches] [10 inches by 34 inches] [12 inches by 34 inches]

Finish: [Brushed Stainless] [Satin Anodized] [Dark Bronze]

* + - * 1. Automatic Operation

FHC Norton Auto Operator

Finish: Aluminum

FHC Wireless Receiver

Bea Panther Series

Push Plate

4.75 inches, square

Finish: Brushed Stainless

Bollard

Finish: Silver

* + - * 1. Panic Devices

FHC [First Choice] [Adams Rite] [Von Duprin ]

[Rim Panic Smooth Case] [Narrow Stile CVR Smooth Case]

Finish: [Satin Chrome] [Dark Bronze]

Request to Exit Switch Kit

* + - 1. Commercial Lock Hardware
				1. Mortise Cylinder Mounting Pad

Finish: [Aluminum] [Dark Bronze]

* + - * 1. Rim Keyed Cylinder

Schlage ‘C’ Keyway

[Keyed Randomly]

Finish: [Aluminum] [Dark Bronze]

* + - * 1. Bolt Kit

Header:

Size: 5/8 inch

Length: [30½ inches to 50 inches] [55-5/8 inches to 77½ inches] [67 inches to 89 inches]

For Cylinder

Centerline to Top of Door

Threshold

Cylinder Height: [34 inches to 37 inches] [To 53-7/16 inches]

* + - * 1. Flush Nylon Bolt Guide

[Standard] [Extended]

* + - * 1. Faceplate for Deadlatch Locks

[Beveled] [Radius Weather-Stripped]

Finish: [Aluminum] [Dark Bronze]

* + - 1. Electromagnetic Locks, Strikes and Accessories
				1. Retraction Kit

FHC First Choice MEL

3000 Series Panics

1 amp 24Vdc Motor

* + - * 1. Power Transfer

FHC Von Duprin

* + - * 1. Power Supply

Electrified Panics

FHC [First Choice] [Adams Rite] [Von Duprin]

[Single] [Double] Door Application

FHC First Choice

MLR Panics 8000 and 3000 Series

FHC Adams Rite

* + - * 1. Transformer

FHC Adams Rite

[Converts: 120V to 12 or 24V AC] [Plug in]

* + - * 1. Power Transfer Swing

Swing Angle: [180 degrees] [105 degrees]

* + 1. Framing Systems
			1. Door Frames and Threshold [(200 Series Narrow Stile Doors)] [(300 Series Medium Stile Doors)] [(500 Series Wide Stile Doors)]
				1. Frame Size: 2 inches by 4½ inches
				2. Door Size: [36 inches] [72 inches] [Custom: \_\_\_\_\_]
				3. [Up and Over Frame] [Transom Frame Height: 126 inches]
				4. Factory Prep: [Offset Pivots] [Butt Hinges] [Center Hung Hardware] [and Lock] [Overhead Concealed Closer] [Overhead Stop]
				5. [Threshold]
				6. Finish:

[Standard: [Satin Anodized] [Bronze Anodized]]

[Custom – Powder Coated:

[Color: \_\_\_\_\_]]

* + - 1. Glazing System
				1. ¼ inch System

FHC 100 Series Center Glazed

Glazing Thickness: [¼ inch] [3/8 inch] [\_\_\_\_]

Aluminum Framing: 1¾ inches by 4½ inches

Finish: [Clear Anodized] [Dark Bronze Anodized]

* + - * 1. 1 inch Insulated Glazing System

2 inch x 4½ inch Center Glazed

Glazing Thickness: [5/8 inch] [1 inch] [1 inch insulated]

Aluminum Framing: 2 inches by 4½ inches

Finish: [Clear Anodized] [Bronze Anodized]

* + - * 1. 1 inch Thermally Broken Insulated Glazing System

2 inch x 4½ inch Center Glazed

Glazing Thickness: [1 inch insulated] [\_\_\_\_\_]

Aluminum Framing:

2 inches by 4½ inches

Thermally Broken

[Jamb/Vertical: Heavy Wall]

Finish: [Clear Anodized] [Bronze Anodized]

* + - 1. Assembly Screws:
				1. Pan Head Philips
				2. Sheet Metal Screw

Size: #10 x 1 inch

FHC #9427

* + 1. Glazing: [Section 08 80 00] [Section 08 88 00]
	1. **Fabrication**
		1. Doors
			1. Fabricate doors, components, hardware and accessories to accommodate required fittings, anchors, and reinforcement.
			2. Shop assemble doors, components, hardware and accessories to greatest extent possible.
				1. Maintain accurate relation of planes and angles with fit of contacting members.
				2. Accurately fit and secure joints and corners.
				3. Make joints hairline in appearance.
				4. Conceal welds per AWS Handbook recommendations.
				5. Follow ANSI Z49.1 – 21 procedures.
				6. Remove burrs and smooth edges.
				7. Prepare components with internal reinforcement for door hardware.
				8. Arrange fasteners and attachments to conceal from view.
				9. Provide protective coating or pre-formed separators to separate dissimilar metals.
			3. Ship completely assembled units ready for installation.
				1. Disassemble minimum number of items necessary to accommodate shipping and installation.
		2. Door Frames and Framing Systems
			1. Fabricate components to achieve the following when assembled:
				1. Profiles: Sharp, straight, and free of defects or deformations.
				2. Joints: Accurately fitted with ends coped or mitered.
				3. Drainage: Provide means to drain water, condensation and moisture.
				4. Glazing and Framing Members:

[Provide physical and thermal isolation.]

Accommodate thermal and mechanical movements to maintain glazing edge clearances.

[Provide provisions to replace glazing in field from exterior.]

* + - * 1. Conceal fasteners, anchors, and connection devices from view.
		1. Finish
			1. Finish:
				1. Anodized Coating: AAMA 611 Class I
				2. Custom: Powder Coated

Color: \_\_\_\_\_\_

1. **EXECUTION**
	1. **Examination**
		1. Verification of Conditions
			1. Examine substrates and supports for compliance with installation tolerances and conditions required for proper installation of tempered glass, and identify conditions detrimental to work.
			2. Verify dimensions, tolerances, and method of attachment with other work.
			3. Verify wall openings and adjoining air and vapor seal materials are ready to receive work.
			4. Proceed with installation after unsatisfactory conditions have been corrected.
	2. **Preparation**
		1. Protection of In-Place Conditions
			1. Exercise care in installing [aluminum-framed storefront with vision glass] [and] [aluminum doors and frames].
			2. Provide means to protect other work from damage.
	3. **Installation**
		1. General:
			1. Install doors, components, hardware and accessories in accordance with manufacturer’s written instructions.
				1. Cutting, drilling and other alternation to tempered glass after tempering is not permitted.
			2. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
			3. Provide alignment attachments and shims to permanently fasten system to building structure.
			4. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
			5. Provide thermal isolation where components penetrate or disrupt building insulation.
			6. Install sill flashings. Turn ends and edges; seal to adjacent work to form water tight dam.
			7. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
			8. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
			9. Set thresholds in bed of sealant and secure.
			10. Install hardware using templates provided.
			11. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
		2. Adjusting
			1. Doors:
				1. Adjust to produce smooth operation, tight fit at contact points and weather tight closure.
				2. Provide a tight fit at meeting points and weather-stripping.
			2. Hardware:
				1. Adjust operating hardware to provide proper operation.

Comply with requirements in Section 08 71 00.

* + - * 1. Install floor closer cases.

Set, seal and grout.

* 1. **Tolerances**
		1. Maximum Variation from Plumb
			1. Lessor of 0.06 inches every 3-foot non-cumulative, or 1/16 inch per 10 feet.
		2. Maximum Misalignment of Two Adjoining Members Abutting in Plane:
			1. 1/32 inch.
	2. **Field Quality Control**
		1. Inspections
			1. Verify components are installed following manufacturer’s installation instructions and meet tolerances.
			2. Verify doors are weather-tight and hardware operates smoothly.
			3. Verify finishes are not marred or damaged.
		2. Non-Conforming Work
			1. Adjust doors and hardware.
			2. Remove and replace items that cannot be repaired to satisfaction of Architect.
			3. Inspect.
	3. **Cleaning**
		1. Tempered Glass:
			1. Clean and polish in accordance with manufacturer written instructions.
			2. Remove excess glazing and sealant compounds, dirt, debris and other substances.
		2. Metal Surfaces:
			1. General:
				1. Wash with clean water and mild detergent.
				2. Avoid abrasive chemicals, detergents and implement that may mar or gouge material.
			2. Protective Film:
				1. Remove from metal surfaces as soon as practical to avoid damage to metal surfaces from adhesives exposed to direct sunlight, and high ambient and surface temperatures.
	4. Protection
		1. Protect doors, hardware and finishes from damage or deterioration.
			1. Provide temporary protective covering approved by manufacturer.
			2. Remove protective coverings at [Substantial Completion] [Project Completion].
		2. Repair damaged components.
			1. Follow manufacturer’s written recommendations.
			2. If component cannot be restored to like-new condition, provide new component.
		3. Restore damaged finishes.
			1. Refinish unit in field or shop.
			2. Reinstall and adjust.

**END OF SECTION**