

Landmark175™ Series

Thermal Steel Windows and Doors

featuring Thermal Evolution™ Technology



HOPE'S®

CUSTOM CRAFTED WINDOWS & DOORS

U-Value

tests to as low as

0.170

The Strength. The Versatility. The *Artistry* of Steel and Bronze.

Hope's hot-rolled steel windows and doors are synonymous with elegance, precision manufacturing and impeccable performance. With Hope's product development, **Thermal Evolution™ Technology**, we continue to maintain all the proven characteristics of traditional fully welded solid hot-rolled steel windows and doors and that of old-world craftsmanship. All the intrinsic strengths of solid hot-rolled steel are maintained along with enhanced thermal efficiency exceeding the most stringent thermal codes.

Hope's Landmark175™ Series thermal steel window design, U.S. Patent No. 8484902 for operable windows and a patent pending for fixed windows, tests to as low as 0.170 U-value.

For more information regarding this new product offering, please contact us or your nearest Hope's Representative. We look forward to working with you.



www.hopeswindows.com

716.665.5124

PO Box 580

Jamestown, NY 14702-0580

Hope's Landmark175™ Series Thermal Steel Windows and Doors



Operable Landmark175™ Series solid steel window with Thermal Evolution™ technology
U.S. Patent No. 8484902

Fixed Landmark175™ Series solid steel window with Thermal Evolution™ technology
Patent pending

Photo: IMG_INK

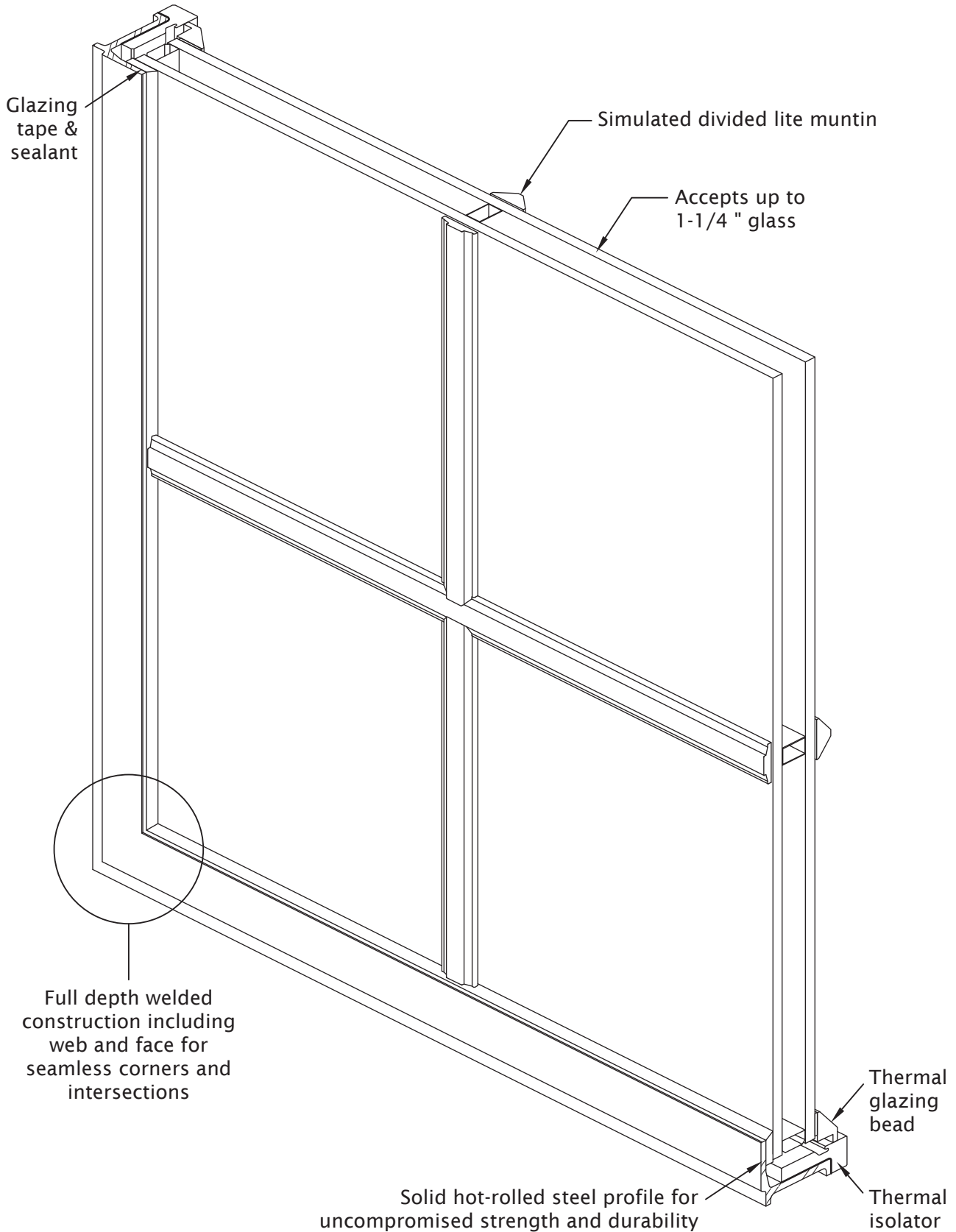
BREAK WITH TRADITION. Traditionally, adding thermal breaks to solid steel windows meant dramatically weakening the steel materials that made them superior in the first place. Now, with Thermal Evolution™ technology, solid steel remains solid. And solid steel windows – fixed or operable – remain just as narrow and graceful as ever. Achieve a NFRC certified U-factor as low as 0.170 with enhanced condensation resistance. Ideal for new construction, retrofit, or historic preservation applications. Learn more today at www.hopeswindows.com/evolution



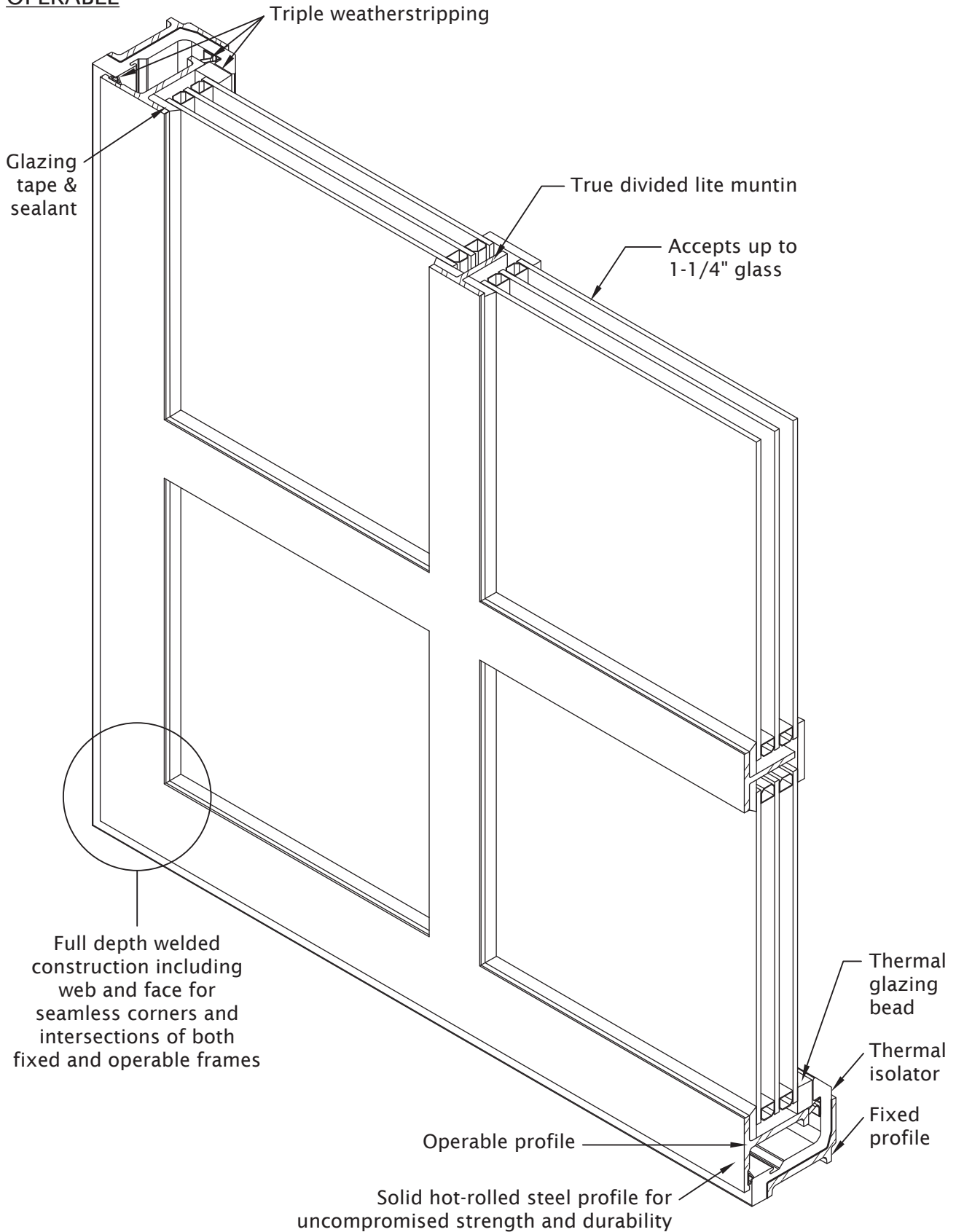
HANDCRAFTED IN THE USA

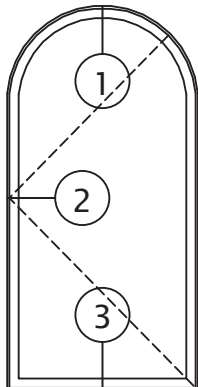
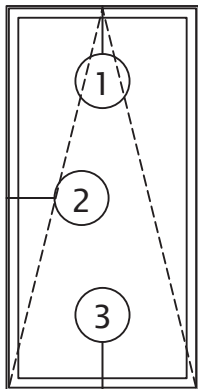
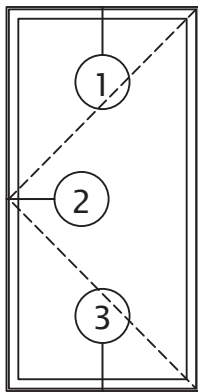
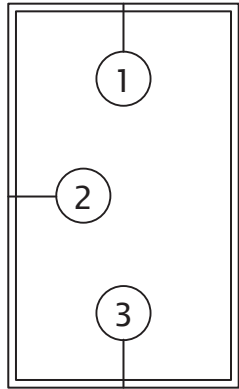
SOLID STEEL AND BRONZE WINDOWS AND DOORS

FIXED

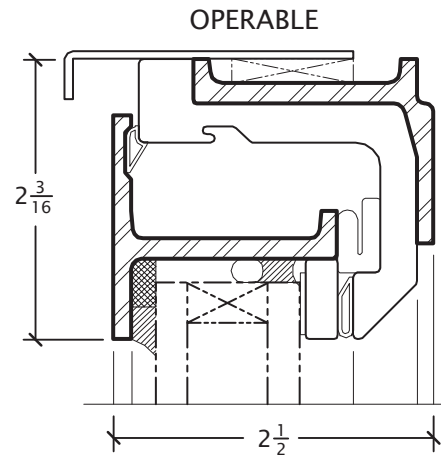
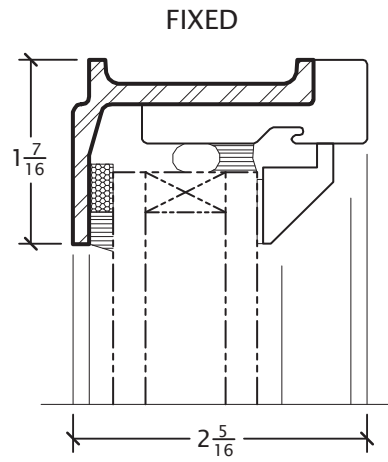


OPERABLE

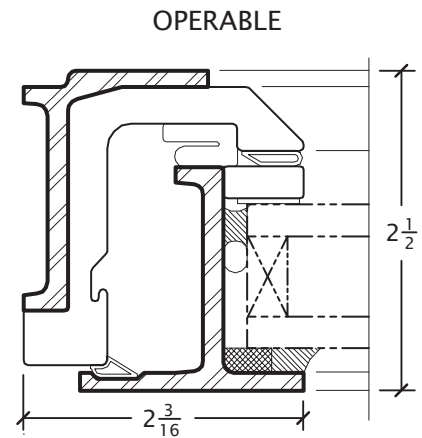
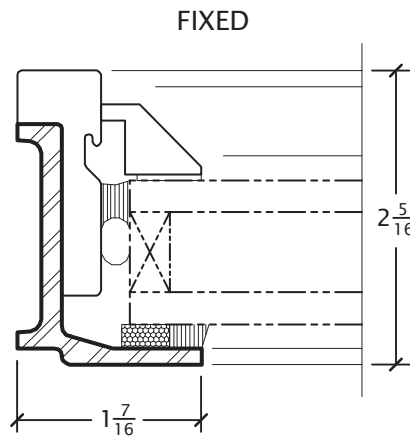




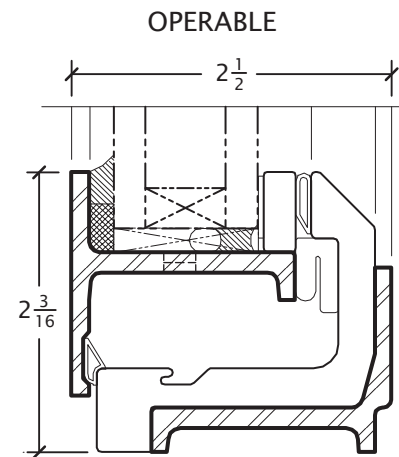
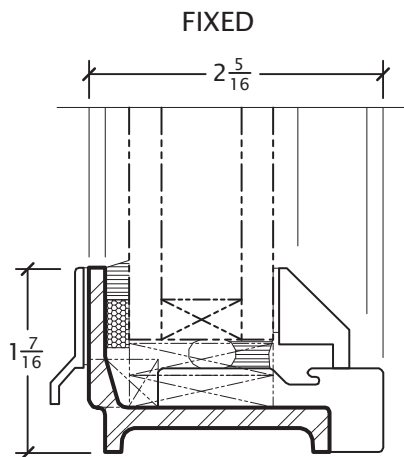
1 HEAD



2 JAMB

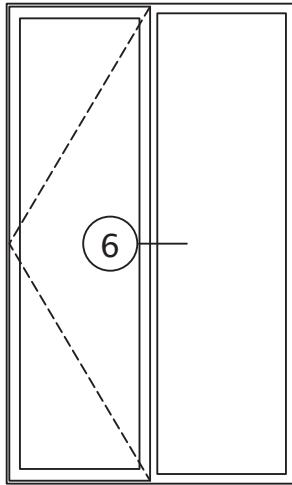


3 SILL

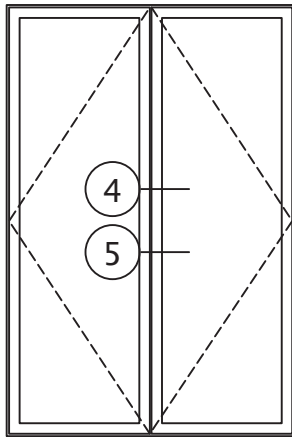
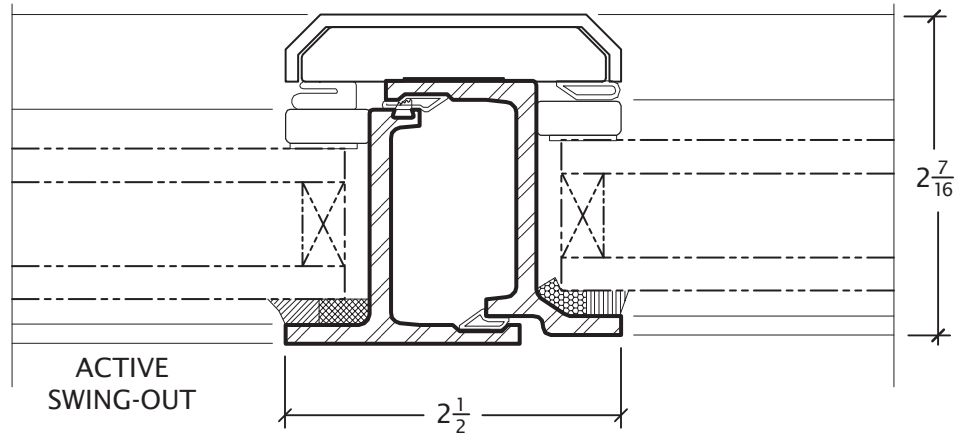


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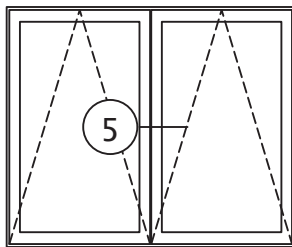
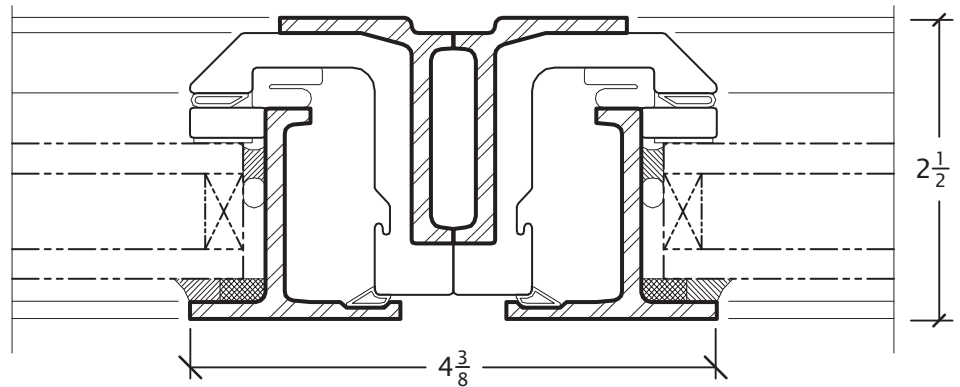
All Hope's products are custom manufactured to your specific project requirements.



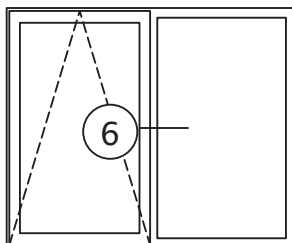
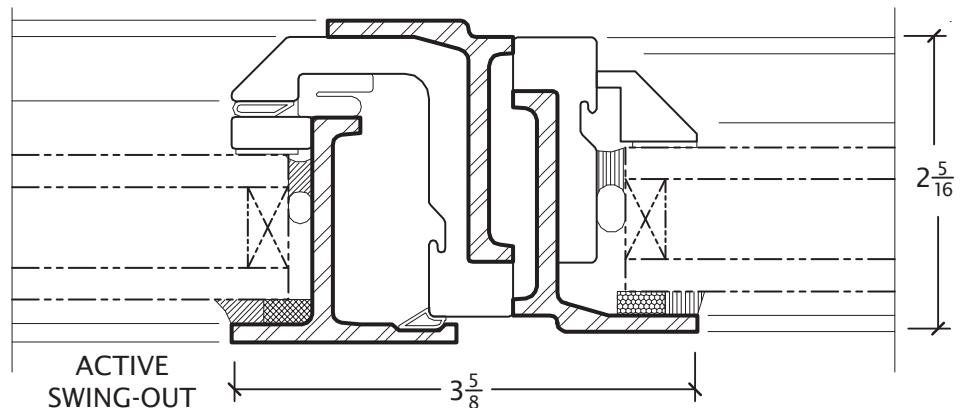
④ DOUBLE FOLDING VERTICAL MEETING RAIL



⑤ DOUBLE OPERABLE VERTICAL MEETING RAIL

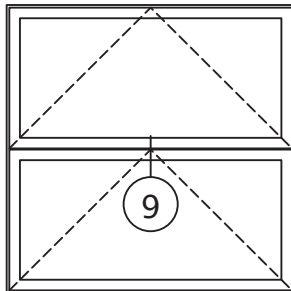
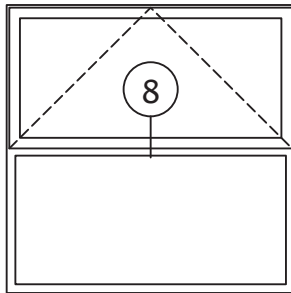
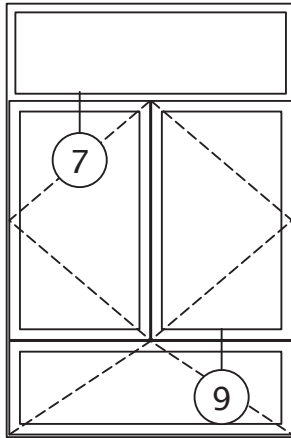


⑥ SINGLE OPERABLE VERTICAL MEETING RAIL

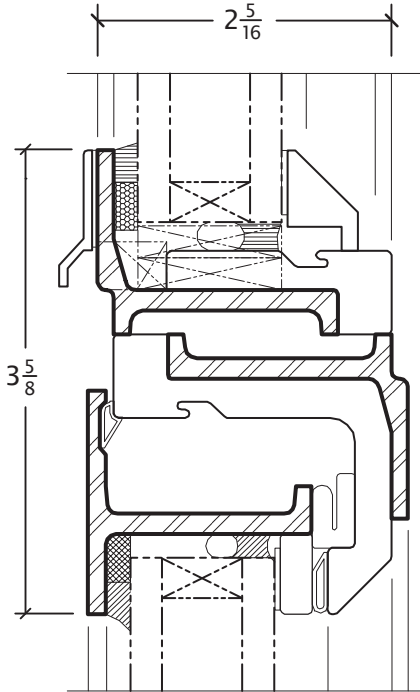


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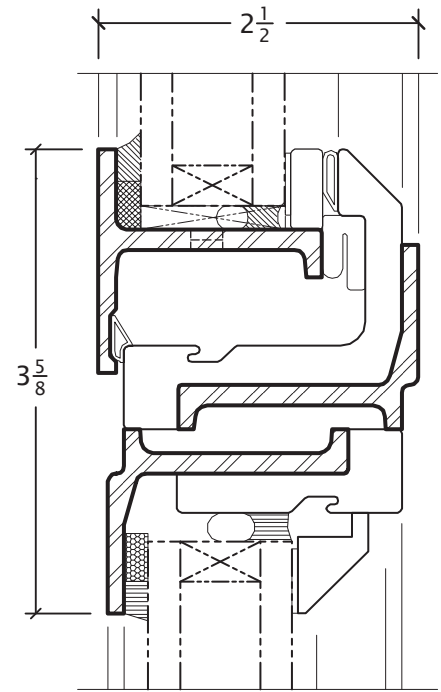
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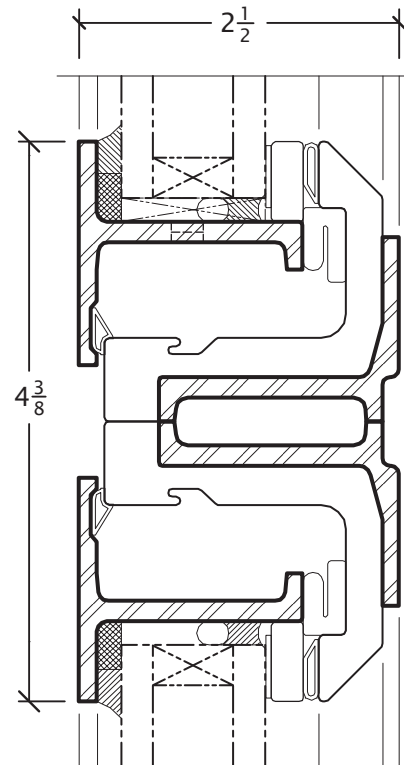
7 **FIXED ABOVE OPERABLE
HORIZONTAL RAIL**



8 **OPERABLE ABOVE FIXED
HORIZONTAL RAIL**

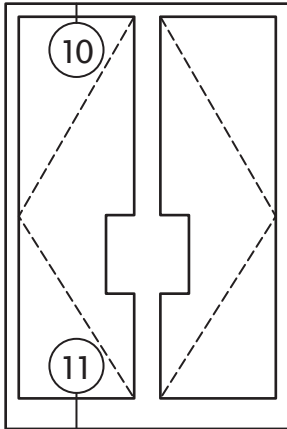


9 **DOUBLE OPERABLE HORIZONTAL RAIL**

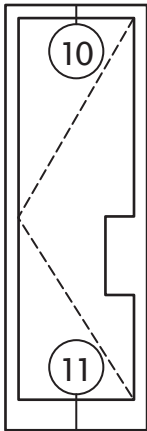
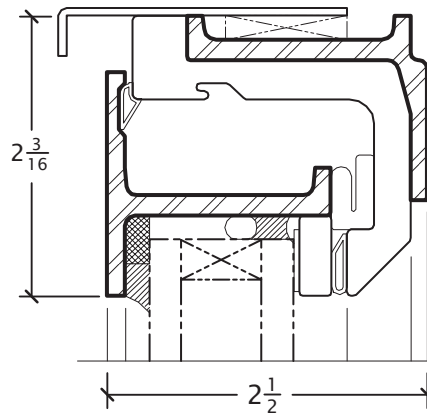


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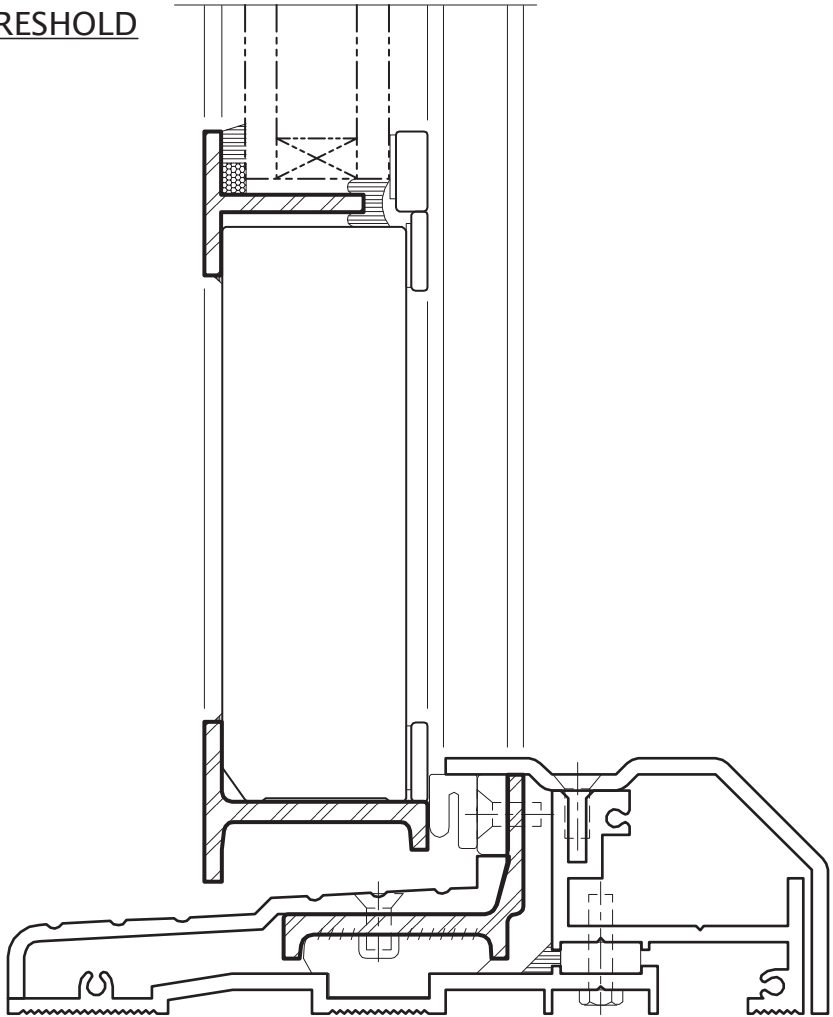
All Hope's products are custom manufactured to your specific project requirements.



10 HEAD

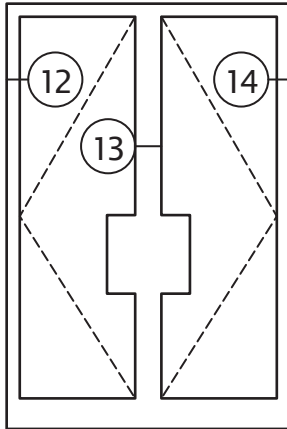


11 THRESHOLD

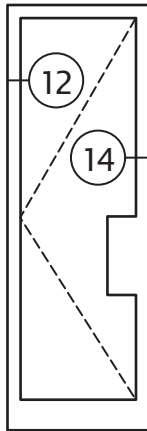
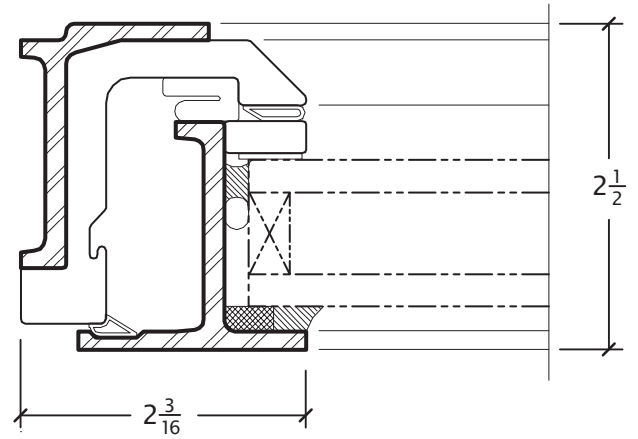


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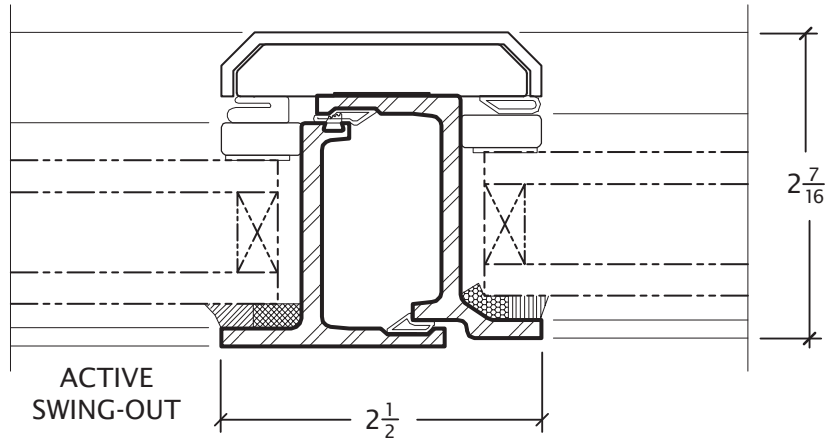
All Hope's products are custom manufactured to your specific project requirements.



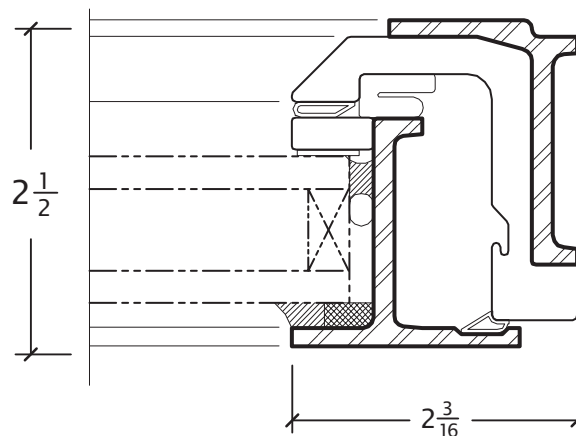
⑫ JAMB



⑬ DOUBLE FOLDING MEETING RAIL

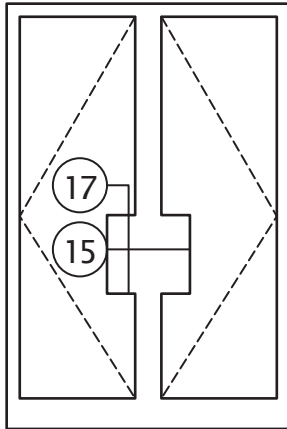


⑭ JAMB

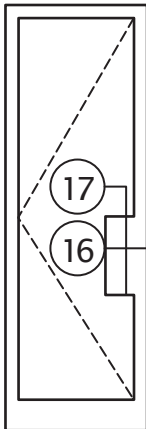
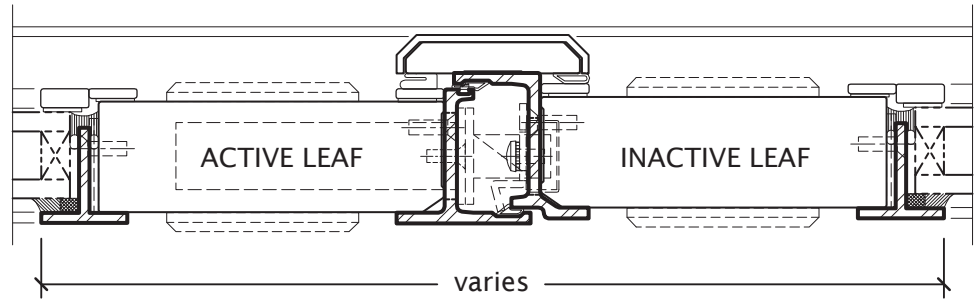


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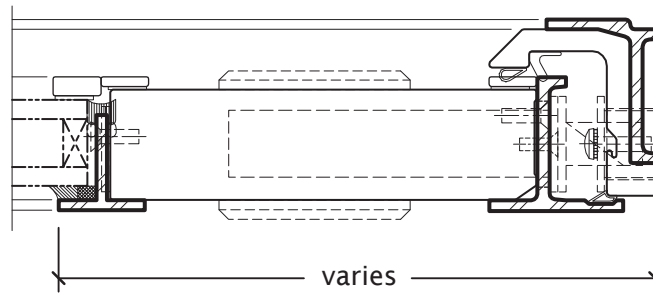
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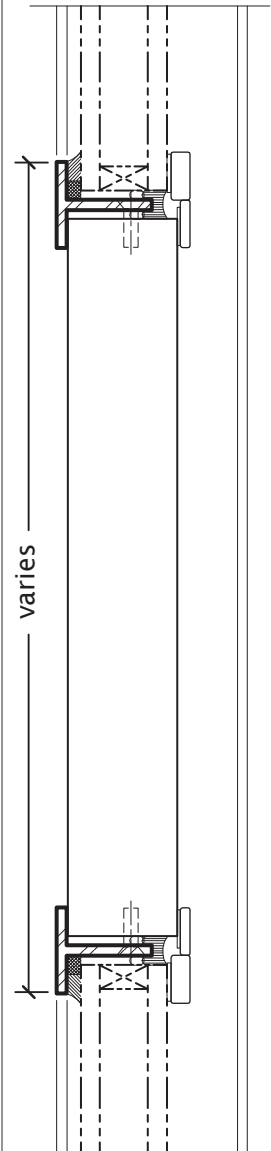
15 LOCKBOX AT DOUBLE FOLDING MEETING RAIL



16 LOCKBOX AT JAMB

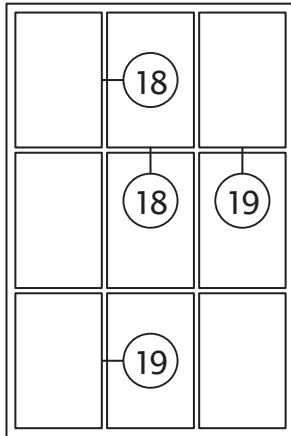


17 LOCKBOX

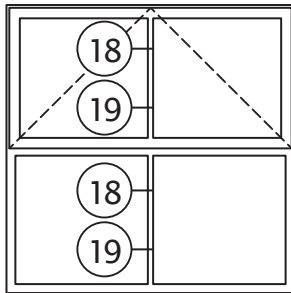
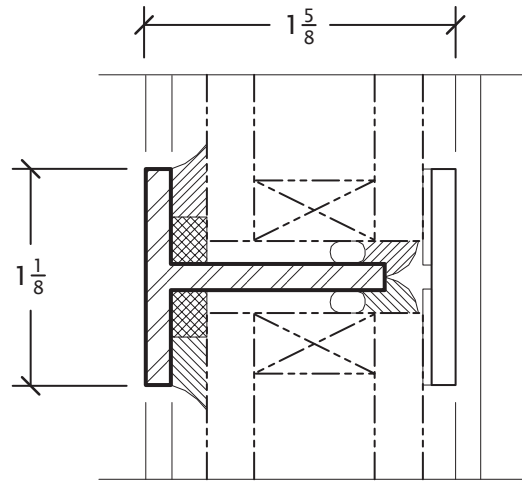


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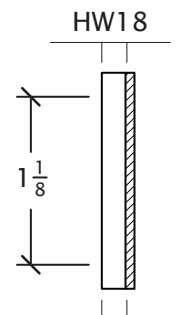
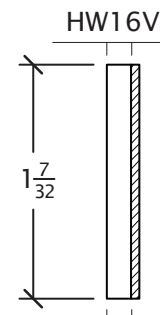
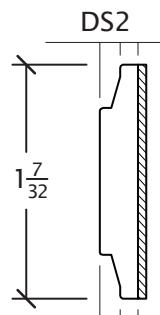
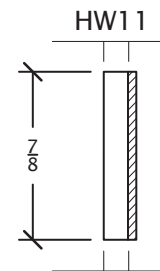
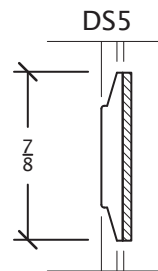
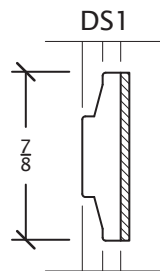
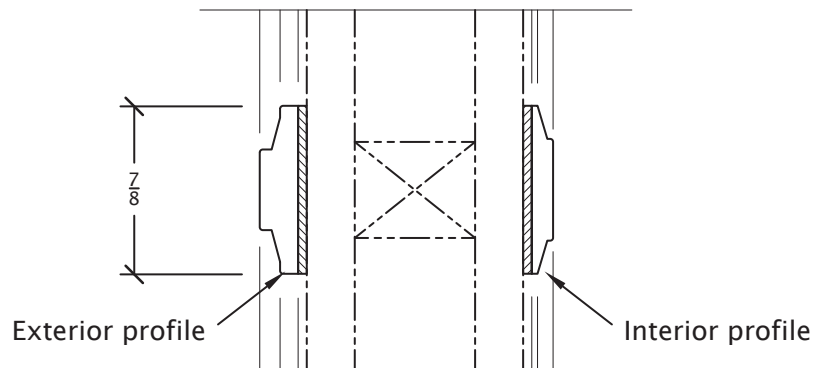
All Hope's products are custom manufactured to your specific project requirements.



18 TRUE DIVIDED LITE MUNTIN PROFILE

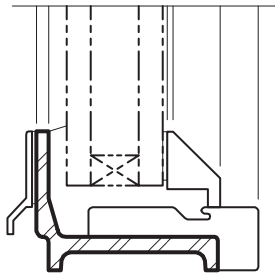


19 SIMULATED DIVIDED LITE MUNTIN PROFILES

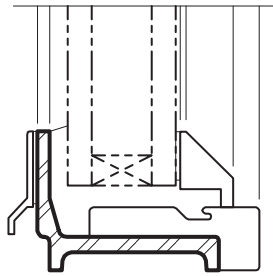


Details are full scale.
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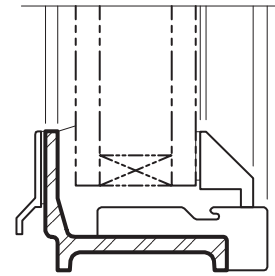
FIXED GLAZING BEAD OPTIONS



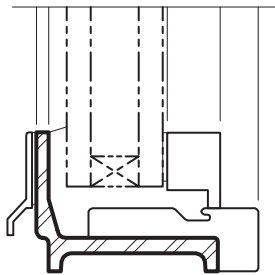
1" GLASS
SLOPED BEAD



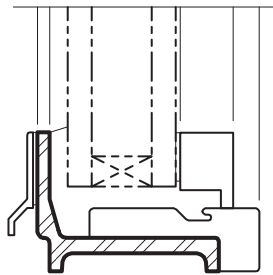
1-1/8" GLASS
SLOPED BEAD



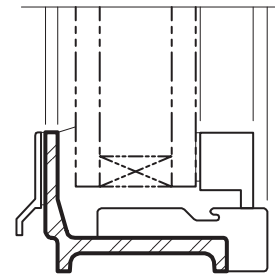
1-1/4" GLASS
SLOPED BEAD



1" GLASS
SQUARE BEAD

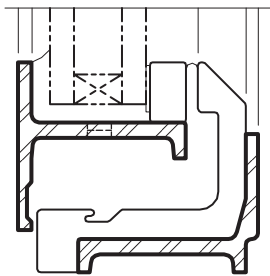


1-1/8" GLASS
SQUARE BEAD

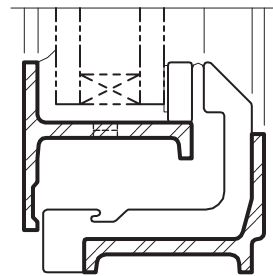


1-1/4" GLASS
SQUARE BEAD

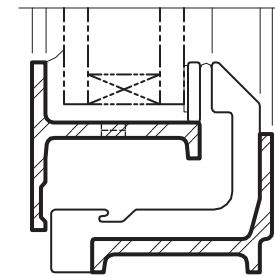
OPERABLE GLAZING BEAD OPTIONS



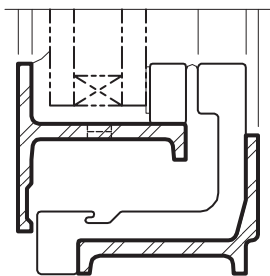
1" GLASS
SLOPED BEAD



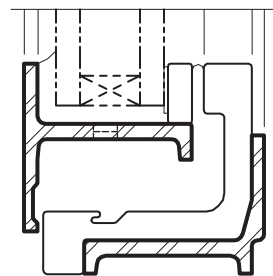
1-1/8" GLASS
SLOPED BEAD



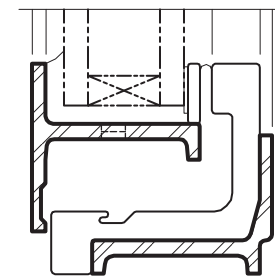
1-1/4" GLASS
SLOPED BEAD



1" GLASS
SQUARE BEAD



1-1/8" GLASS
SQUARE BEAD



1-1/4" GLASS
SQUARE BEAD

Details are 1/2 scale and shown inside glazed.

HOPE'S®

LANDMARK175™ SERIES FIXED, PROJECTED AND CASEMENT STEEL WINDOWS WITH THERMAL EVOLUTION™ TECHNOLOGY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included:

1. Hot-rolled thermal steel triple weatherstripped windows with fixed, project-out, project-in, side hung-out or side hung-in configurations.
2. All window anchors, mullions, covers and trim.
3. Stainless steel insect screens for all operating ventilators. (optional)
4. Factory applied Hope's Power of 5 Finishing System.

B. Related work specified elsewhere:

1. Glass, glazing and glazing materials, Section 08810.
2. Perimeter caulking, Section 07915.
3. Miscellaneous structural items, Section 05100.

1.2 QUALITY ASSURANCE

A. Manufacturer shall have not less than 10 years experience in the fabrication of heavy intermediate steel windows and be a member of The Steel Window Institute (SWI).

B. Installation of windows shall be done by experienced window installers.

C. Allowable tolerances: Size dimensions + 1/16 inch.

D. Source quality control:

1. Air infiltration test

- a. Products must be independently lab tested in accordance with ASTM E283.
- b. Air infiltration to meet or exceed 0.30 CFM/ SQFT with differential pressure across window unit of 1.57 / 6.24 PSF.

2. Water penetration test for out-swing ventilators

- a. Products must be independently lab tested in accordance with ASTM E331.
- b. No water penetration for 15 minutes when window is subjected to a rate of flow of 5 gal./hr./sq.ft. with differential pressure across window unit of 4.50 PSF.
- c. ASTM E547 cyclic testing standard with differential pressure across window unit of 4.50 PSF shall be standard.

3. Water penetration test for in-swing ventilators

- a. Products must be independently lab tested in accordance with ASTM E331.
- b. No water penetration for 15 minutes when window is subjected to a rate of flow of 5 gal./hr./sq.ft. with differential pressure across window unit of 2.86 PSF.
- c. ASTM E547 cyclic testing standard with differential pressure across window unit of 2.86 PSF shall be standard.

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4. Field Testing
 - a. Field testing criteria (when applicable) shall be in accordance with AAMA 502-12.
5. Structural test
 - a. Meets or exceeds ASTM E330.
6. Thermal performance test
 - a. Products must be independently lab tested, listed and certified for U-value performance in accordance with NFRC-100.
 - b. Products must be independently lab tested, listed and certified for solar heat gain coefficient in accordance with NFRC-200.
 - c. Products must be independently lab tested, listed and certified for air infiltration in accordance with NFRC-400.
 - d. Products must be independently lab tested, listed and certified for condensation resistance performance in accordance with NFRC-500.
7. Forced entry test
 - a. Meets or exceeds ASTM F588
 - b. Grade 40 @ 300 pounds
8. Quality of Power of 5 finishing process shall meet or exceed the following ASTM designations:
 - a. ASTM D714- Paint Blistering Test
 - b. ASTM D4585 – Humidity Test
 - c. ASTM B117 – Salt Spray (Fog) Test
 - d. ASTM D1654 – Painted Products in Corrosive Environments
 - e. ASTM G85 – Cyclic Fog/Dry Test (Prohesion)
 - f. ASTM D5894 – Salt Fog/UV Painted Metal
 - g. ASTM D4541 – Pull off Strength of Coating Test
9. Upon request, the window manufacturer shall provide a test report from a qualified independent U.S. testing laboratory regularly engaged in testing windows to verify that products conform to test requirement as outlined.

1.3 SUBMITTALS

- A. Samples (as requested by architect):
 1. Typical 6" long window profile with glazing beads.
 2. Sample of specified muntin, showing welded intersections and glazing beads.
 3. Color sample of finish.
 4. Hardware.

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LANDMARK175™ SERIES FIXED, PROJECTED AND CASEMENT STEEL WINDOWS WITH THERMAL EVOLUTION™ TECHNOLOGY

B. Shop drawings and manufacturer's literature:

1. Submit for approval shop drawings showing window and installation details, including anchorage, fastening and recommended sealing methods.
2. Dimensioned elevations showing window opening and window sizes.
3. The manufacturer shall not commence any work until shop drawings have been approved.
4. Color charts for finishes.

1.4 PRODUCT, STORAGE AND HANDLING

- A. The General Contractor shall be responsible for the protection and storage of the windows after delivery to the site.
- B. Store in designated areas in an upright position on wood slats or on a dry floor in a manner that will prevent damage. Ventilate canvas or plastic coverings to prevent humidity buildup.

1.5 WARRANTY

- A. Provide Hope's standard 10 year Limited Warranty.

PART 2 - PRODUCT AND FABRICATION

2.1 MANUFACTURERS

- A. Furnish all labor and materials to complete the fabrication of windows as shown on architect's drawings and as specified herein. All windows covered by this specification shall be domestically manufactured in the U.S.A.
- B. Manufacturers: Subject to compliance with requirements covered in this specification, provide products by Hope's Windows, Inc. – Jamestown, NY (phone: 716-665-5124, e-mail: sales@hopeswindows.com) whose name and products are used to establish the standard of workmanship.
- C. Substitutions: Written approval necessary 10 days prior to bid through submission of the following:
 1. Full-size window/door samples matching required scope.
 2. Applicable test reports as outlined in Quality Assurance Section 1.2.
 3. List of five recently completed projects of similar size and scope.

2.2 MATERIALS

- A. Heavy intermediate triple weatherstripped windows shall be manufactured from solid hot-rolled steel profiles with thermal isolator.
 1. Profiles made from steel with flanges rolled integrally at the mill.
 2. Perimeter frames and ventilator profiles shall have glazing rebates providing an unobstructed glazing surface of at least 5/8".
 3. Glazing rebate surfaces must be perpendicular to the web or stem of the profile. Applied glazing rebate extensions and rebate surfaces that are tapered will not be acceptable.
 4. Combined weight of frame and ventilator composite profiles shall be a minimum of 4.10 pounds per lineal foot. Frame composite profile alone shall not weigh less than 2.10 pounds per lineal foot.
 5. All steel profiles must be a minimum of 1-3/4" in depth.

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6. The solid hot-rolled steel ventilator profile shall have integral groove located at the exterior bedding contact for the reception of weatherstripping.
 7. The isolated composite frame shall provide two additional bedding contacts of weatherstripping to complete triple weatherstripping.
- B. Muntins (*select from items 1 or 2 below*):
1. *True Divided Lite muntins*:
 - a. Muntins shall be manufactured from solid hot-rolled steel. Size to be determined by design.
 - b. Glazing rebate surfaces must be perpendicular to the stem of this profile. Rebate surfaces that are tapered will not be acceptable.
 - c. 1-1/8" tee shall weigh 1.037 pounds per lineal foot.
 - d. All steel muntin profiles must be a minimum of 1-1/4" in depth.
 2. *Simulated Divided Lite muntins (select from items below)*:
 - a. Interior/exterior muntin - Profiles shall be extruded aluminum Alloy 6063-T5 matching the profiles as detailed.
- C. Thermal isolators shall be composite profile with a minimum wall thickness of .080 inches.
- D. Glazing beads shall be composite profile with a minimum wall thickness of .080 inches.
- E. Weatherstripping shall be extruded vinyl, EPDM closed cell sponge, flexible silicone or polyethylene clad urethane foam.
- F. Operable Hardware (Select from the following):
1. Project-Out Ventilators with roto operators:
 - a. Fastener: Brass or Bronze cam fastener.
 - b. Ventilators shall be hung on heavy-duty stainless steel four bar hinges with brass friction shoes.
 - c. Dual arm roto operators: Solid brass or bronze housing with stainless steel arms and gears.
 2. Project-In Ventilators:
 - a. Fastener: Brass or Bronze cam fastener.
 - b. Ventilators shall be hung on heavy-duty stainless steel four bar hinges with brass friction shoes.
 3. Side hung-out ventilators with roto operators:
 - a. Fastener: Brass or Bronze cam fastener.
 - b. Pivots: Aluminum-bronze pivot with stainless steel pin.
 - c. Roto Operators: Solid bronze housing.
 4. Side hung-in ventilators:
 - a. Fastener: Brass or Bronze cam fastener.
 - b. Pivots: Aluminum-bronze pivot with stainless steel pin.
 - c. Friction and limit device: Stainless steel with sliding brass shoe and screw adjusted friction.

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- G. All screws that are furnished by Hope's for hardware, trim, covers, anchoring, weatherbars, water dams, screens, etc. shall be non-ferrous brass or stainless steel. Glazing bead retainer screws are plated steel.
- H. Stainless Steel Insect Screens (optional):
 - 1. Frames shall be roll-formed 20 gauge stainless steel.
 - 2. Stainless steel screens shall be .011 diameter wire, woven to 14 x 18 mesh count. Mesh is available in several types of material; see screen profile for type of mesh (specify) and further screen specifications.
- I. Power of 5 Finishing:
 - 1. Cleaning
 - 2. Pretreatment
 - 3. Epoxy E-Coat primer
 - 4. Epoxy powder primer
 - 5. Ultrathane polyurethane top coat

2.3 FABRICATION

- A. Fabricate steel windows in accordance with approved shop drawings.
- B. Corners of solid hot-rolled steel frame and ventilator profiles shall be mitered or coped then fully welded. Exposed and contact surfaces shall be finished smooth flush with the adjacent surfaces. All interior and exterior rail bar joints shall be face welded and ground smooth.
- C. Muntins (*select from 1 and 2*):
 - 1. True Divided Lite muntins shall be coped and welded to the perimeter frame. Muntin intersections shall be slotted, cross notched and welded. All interior and exterior muntin joints shall be face welded and ground smooth.
 - 2. Simulated Divided Lite Grids:
 - a. Interior/exterior applied muntins - Profile shall be precut to meet perimeter frame. The intersections shall be milled to the extrusion profile. The muntin components shall be applied to the face of the glass with .045" VHB™ double adhesive tape after glazing.
- D. Thermal Isolators
 - 1. Corners shall be miter cut and gusseted into frame form.
 - 2. Thermal isolator frames shall be bonded to solid hot-rolled steel window frame.
- E. Glazing
 - 1. All windows shall be designed for interior glazing for out-swing and exterior glazing for in-swing ventilators.
 - 2. Provide replaceable continuous glazing beads to suit the glass as specified.
 - 3. Glazing beads shall be cut and shop fitted to each glass lite prior to shipment.
 - 4. Manufacturer to provide correct glazing details in accordance with the tested assembly.

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F. Weatherstrip

1. All ventilators shall receive continuous triple weatherstripping that shall be applied to the interior and exterior contact surfaces of the frame and ventilator profiles.

G. Operable Hardware (Select from the following):

1. Project-out ventilators with roto operators:
 - a. Provide two fasteners per ventilator.
 - b. Ventilators shall be hung on heavy-duty stainless steel four bar hinges, having friction maintained by a sliding brass shoe with screw adjustment.
 - c. Handles of dual arm roto operators are to be shipped loose for field installation.
2. Project-in ventilators with roto operators:
 - a. Provide two fasteners per ventilator.
 - b. Ventilators shall be hung on heavy-duty stainless steel four bar hinges, having friction maintained by a sliding brass shoe with screw adjustment.
3. Side hung-out ventilators with roto operators:
 - a. Casement ventilator shall be hung on pivots.
 - b. Provide three pivots when ventilator height exceeds 5'-6".
 - c. Provide thru section fasteners.
 - d. Handles of roto-operators are shipped loose for field installation.
4. Side hung-in ventilators with roto operators:
 - a. Casement ventilator shall be hung on pivots.
 - b. Provide three pivots when ventilator height exceeds 5'-6".
 - c. Provide thru section fasteners.

H. Stainless Steel Insect Screens (optional):

1. Stainless steel screen frames shall be finished to match the windows.
2. Stainless steel screens shall be rewirable to allow for mesh replacement.
3. Stainless steel screen fastenings shall permit easy attachment and removal from the interior. See screen profile for further specifications.

2.4 FACTORY FINISHING

A. Cleaning

1. All hot-rolled steel profiles must be acid pickled as defined by SSPC – SP8 to ensure a pristine, white metal substrate prior to fabrication.

B. Pretreatment

1. Following welding and all machining operations, hot-rolled products and accessories are subjected to the following pretreatments geared specific to projects proximity to corrosive environment. Cold-

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rolled, formed sheet steel components are manufactured from A60 galvanized sheet and subjected to applicable processes outlined below. (*Select from items 1 or 2 below*)

2. Inland locations (12-stage process) – Greater than one (1) mile from salt water and/or similar corrosive environments.
 - a. Alkaline cleaning spray
 - b. Alkaline cleaning – submersion
 - c. Water immersion rinse combo
 - d. Water immersion rinse clean
 - e. Acid immersion
 - f. Neutralizing rinse
 - g. Water immersion rinse clean
 - h. Conditioner immersion
 - i. Zinc phosphate immersion
 - j. Rinse immersion
 - k. Sealer immersion
 - l. Water reverse osmosis rinse immersion
3. Ocean Front/Coastal locations (13-stage process) – Within one (1) mile of salt water and similar corrosive environment.
 - a. Zinc metal deposition (Electroplate and/or hot-dip, consult Hope's)
 - b. Alkaline cleaning spray
 - c. Alkaline cleaning – submersion
 - d. Water immersion rinse combo
 - e. Water immersion rinse clean
 - f. Acid immersion
 - g. Neutralizing rinse
 - h. Water immersion rinse clean
 - i. Conditioner immersion
 - j. Zinc phosphate immersion
 - k. Rinse immersion
 - l. Sealer immersion
 - m. Water reverse osmosis rinse immersion

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C. Epoxy E-coat Primer

All pickled and pretreated frames and accessories are immersed into an electrostatic (E-coat) bath of PPG epoxy primer to ensure all substrates are encapsulated evenly and completely. Use of spray primers only will not be an acceptable alternative to this process due to benefits from additional cleaning and frame submersion.

1. Permeate spray
2. Permeate rinse
3. Epoxy primer immersion and electrostatic encapsulation
4. Water reverse osmosis rinse
5. Oven-cure, 45 minutes @ 350° F

D. Epoxy Powder Primer

Following pretreatments and E-coat system, all frames and accessories shall receive an abrasion resistant powder coating prior to final top-coat.

1. Powder is applied electrostatically over cured E-coat to a dry film thickness (DFT) of 2.0-3.0 mils.
2. Parts oven baked at 325° F to completely cure prior to final top coat.
3. Powder coat is intended as an intermediate finish applied prior to the final finish top coat.

E. Ultrathane Polyurethane Top Coat

Following all pretreatments, e-coat and powder abrasion layer, all products shall receive Hope's ultrathane polyurethane finish with touch-up capability, low chalking and fading characteristics, unlimited color matching, and 70,000+ standard colors, including metallics.

F. POWER OF 5 OVERVIEW

1. Combined overall dry film thickness shall be a minimum of 4.6 mils (inland locations) and 7.1 mils (coastal locations).
2. Overall process shall provide full documented compliance with the following criteria:
 - a. SSPC-SP8 for acid pickling
 - b. ASTM D714-02 Paint Blistering Test
 - c. ASTM D4585 Humidity
 - d. ASTM D1654-05 Painted Products in Corrosive Environment
 - e. ASTM B117-03 Salt Spray (Fog) Test
 - f. ASTM G85 Cyclic Fog/ Dry Test (Prohesion)
 - g. ASTM D5894-96 Salt Fog/ UV Painted Metal
 - h. ASTM D4541 Pull Off Strength of Coating Test

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PART 3 - EXECUTION

3.1 INSPECTION

- A. Window openings shall conform to details, dimensions and tolerances shown on the window manufacturer's approved shop drawings.
- B. Conditions which may adversely affect the window installation must be corrected before installation commences.
- C. The wash down of the adjacent masonry or surrounding substrate must be completed before erection commences to prevent damage to the finish by the cleaning materials.

3.2 INSTALLATION

- A. Windows specified under this section shall be installed by experienced personnel.
- B. Install windows in openings in strict accordance with approved shop drawings.
 - 1. Set units plumb, level and true to line, without warp or rack of frames.
 - 2. Anchor units securely to surrounding construction with approved fasteners.
 - 3. The exterior joints between the windows, trim and mullions shall be properly sealed watertight with an approved sealant and neatly pointed.
- C. Attach ventilator hardware, as required, and adjust ventilators to operate smoothly free from twist and to be weathertight when closed.
- D. Attach loose muntin grids per approved shop drawings, if applicable.
- E. Repair any abraded areas of the factory finish.

3.3 CLEANING

- A. Window installer shall leave window surfaces clean after installation and ready to receive glass and glazing. The window installer will not be responsible for final cleaning.

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PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included:

1. Hot-rolled thermal steel triple weatherstripped swing door configurations.
2. All door anchors, mullions, covers and trim.
3. Factory applied Hope's Power of 5 Finishing System.

B. Related work specified elsewhere:

1. Glass, glazing and glazing materials, Section 08810.
2. Perimeter caulking, Section 07915.
3. Miscellaneous structural items, Section 05100.

1.2 QUALITY ASSURANCE

A. Manufacturer shall have not less than 10 years experience in the fabrication of heavy intermediate steel doors and be a member of The Steel Window Institute (SWI).

B. Installation of doors shall be done by experienced window installers.

C. Allowable tolerances: Size dimensions + 1/16 inch.

D. Source quality control for out-swing doors:

1. Air infiltration test

- a. Products must be independently lab tested in accordance with ASTM E283.
- b. Air infiltration to meet or exceed 0.30 CFM/ SQFT with differential pressure across door unit of 1.57 / 6.24 PSF.

2. Water penetration test

- a. Products must be independently lab tested in accordance with ASTM E331.
- b. No water penetration for 15 minutes when door is subjected to a rate of flow of 5 gal./hr./sq.ft. with differential pressure across window unit of 4.50 PSF.
- c. When weeps are required, ASTM E547 cyclic testing standard with differential pressure across door unit of 4.50 PSF shall be standard.

3. Water penetration test for in-swing doors

- a. Products must be independently lab tested in accordance with ASTM E331.
- b. No water penetration for 15 minutes when door is subjected to a rate of flow of 5 gal./hr./sq.ft. with differential pressure across door unit of 2.86 PSF.
- c. ASTM E547 cyclic testing standard with differential pressure across door unit of 2.86 PSF shall be standard.

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4. Field Testing
 - a. Field testing criteria (when applicable) shall be in accordance with AAMA 502-12.
5. Structural test
 - a. Meets or exceeds ASTM E330.
6. Thermal performance test
 - a. Products must be independently lab tested, listed and certified for U-value performance in accordance with NFRC-100.
 - b. Products must be independently lab tested, listed and certified for solar heat gain coefficient in accordance with NFRC-200.
 - c. Products must be independently lab tested, listed and certified for air infiltration in accordance with NFRC-400.
 - d. Products must be independently lab tested, listed and certified for condensation resistance performance in accordance with NFRC-500.
7. Forced entry test
 - a. Meets or exceeds ASTM F588
 - b. Grade 40 @ 300 pounds
8. Quality of Power of 5 finishing process shall meet or exceed the following ASTM designations:
 - a. ASTM D714- Paint Blistering Test
 - b. ASTM D4585 – Humidity Test
 - c. ASTM B117 – Salt Spray (Fog) Test
 - d. ASTM D1654 – Painted Products in Corrosive Environments
 - e. ASTM G85 – Cyclic Fog/Dry Test (Prohesion)
 - f. ASTM D5894 – Salt Fog/UV Painted Metal
 - g. ASTM D4541 – Pull off Strength of Coating Test
9. Upon request, the door manufacturer shall provide a test report from a qualified independent U.S. testing laboratory regularly engaged in testing doors to verify that products conform to test requirement as outlined.

1.3 SUBMITTALS

- A. Samples (as requested by architect):
 1. Typical 6" long door profile with glazing beads.
 2. Sample of specified muntin, showing welded intersections and glazing beads.
 3. Color sample of finish.
 4. Hardware.

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- B. Shop drawings and manufacturer's literature:
 - 1. Submit for approval shop drawings showing door and installation details, including anchorage, fastening and recommended sealing methods.
 - 2. Dimensioned elevations showing door opening and door sizes.
 - 3. The manufacturer shall not commence any work until shop drawings have been approved.
 - 4. Color charts for finishes.

1.4 PRODUCT, STORAGE AND HANDLING

- A. The General Contractor shall be responsible for the protection and storage of the doors after delivery to the site.
- B. Store in designated areas in an upright position on wood slats or on a dry floor in a manner that will prevent damage. Ventilate canvas or plastic coverings to prevent humidity buildup.

1.5 WARRANTY

- A. Provide Hope's standard 10 year Limited Warranty.

PART 2 - PRODUCT AND FABRICATION

2.1 MANUFACTURERS

- A. Furnish all labor and materials to complete the fabrication of doors as shown on architect's drawings and as specified herein. All doors covered by this specification shall be domestically manufactured in the U.S.A.
- B. Manufacturers: Subject to compliance with requirements covered in this specification, provide products by Hope's Windows, Inc. – Jamestown, NY (phone: 716-665-5124, e-mail: sales@hopeswindows.com) whose name and products are used to establish the standard of workmanship.
- C. Substitutions: Written approval necessary 10 days prior to bid through submission of the following:
 - 1. Full-size door samples matching required scope.
 - 2. Applicable test reports as outlined in Quality Assurance Section 1.2.
 - 3. List of five recently completed projects of similar size and scope.

2.2 MATERIALS

- A. Heavy intermediate triple weatherstripped doors shall be manufactured from solid hot-rolled steel profiles with thermal isolator.
 - 1. Profiles made from steel with flanges rolled integrally at the mill.
 - 2. Perimeter frames and ventilator profiles shall have glazing rebates providing an unobstructed glazing surface of at least 5/8".
 - 3. Glazing rebate surfaces must be perpendicular to the web or stem of the profile. Applied glazing rebate extensions and rebate surfaces that are tapered will not be acceptable.
 - 4. Combined weight of frame and door composite profiles shall be a minimum of 4.10 pounds per lineal foot. Frame composite profile alone shall not weigh less than 2.10 pounds per lineal foot.
 - 5. All steel profiles must be a minimum of 1-3/4" in depth.

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6. The solid hot-rolled steel door profile shall have integral groove located at the exterior bedding contact for the reception of weatherstripping.
 7. Kick panels shall be of composite construction.
 8. Lockbox and lock stile shall be of composite construction.
 9. The isolated composite frame shall provide two additional bedding contacts of weatherstripping to complete triple weatherstripping.
- B. Muntins (*select from items 1 or 2 below*):
1. *True Divided Lite muntins*:
 - a. Muntins shall be manufactured from solid hot-rolled steel. Size to be determined by design.
 - b. Glazing rebate surfaces must be perpendicular to the stem of this profile. Rebate surfaces that are tapered will not be acceptable.
 - c. 1-1/8" tee shall weigh 1.037 pounds per lineal foot.
 - d. All steel muntin profiles must be a minimum of 1-1/4" in depth.
 2. *Simulated Divided Lite muntins (select from items below)*:
 - a. Interior/exterior muntin - Profiles shall be extruded aluminum Alloy 6063-T5 matching the profiles as detailed.
- C. Thermal isolators shall be composite profile with a minimum wall thickness of .080 inches.
- D. Glazing beads shall be composite profile with a minimum wall thickness of .080 inches.
- E. Weatherstripping shall be extruded vinyl, EPDM closed cell sponge, flexible silicone or polyethylene clad urethane foam.
- F. All screws that are furnished by Hope's for hardware, trim, covers, anchoring, weatherbars, water dams, screens, etc. shall be non-ferrous brass or stainless steel. Glazing bead retainer screws are plated steel.
- G. Power of 5 Finishing:
1. Cleaning
 2. Pretreatment
 3. Epoxy E-Coat primer
 4. Epoxy powder primer
 5. Ultrathane polyurethane top coat

2.3 FABRICATION

- A. Fabricate steel doors in accordance with approved shop drawings.
- B. Prior to fabrication, all hot-rolled steel sections shall be cleaned by shot blasting.
- C. Corners of frame and doors shall be mitered or coped then solidly welded. Exposed and contact surfaces shall be finished smooth flush with the adjacent surfaces. All interior and exterior rail bar and muntin joints shall be face welded and ground smooth.

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D. Lock boxes and Kickpanels

1. Kickpanels, lock boxes and lock styles shall be composite profiles shown on the shop drawings and glazed into the door leaf.

E. Muntins (*select from 1 and 2*):

1. True Divided Lite muntins shall be coped and welded to the perimeter frame. Muntin intersections shall be slotted, cross notched and welded. All interior and exterior muntin joints shall be face welded and ground smooth.
2. Simulated Divided Lite Grids:
 - a. Interior/exterior applied muntins - Profile shall be precut to meet perimeter frame. The intersections shall be milled to the extrusion profile. The muntin components shall be applied to the face of the glass with .045" VHB™ double adhesive tape after glazing.

F. Thermal Isolators

1. Corners shall be miter cut and gusseted into frame form.
2. Thermal isolator frames shall be bonded to solid hot-rolled steel door frame.

G. Glazing

1. All doors shall be designed for interior glazing.
2. Provide replaceable continuous glazing beads to suit the glass as specified.
3. Glazing beads shall be cut and shop fitted to each glass lite prior to shipment.
4. Manufacturer to provide correct glazing details in accordance with the tested assembly.

H. Weatherstrip

1. All doors shall receive continuous triple weatherstripping that shall be applied to the interior and exterior contact surfaces of the frame and door profiles.

2.4 FACTORY FINISHING

A. Cleaning

1. All hot-rolled steel profiles must be acid pickled as defined by SSPC – SP8 to ensure a pristine, white metal substrate prior to fabrication.

B. Pretreatment

1. Following welding and all machining operations, hot-rolled products and accessories are subjected to the following pretreatments geared specific to projects proximity to corrosive environment. Cold-rolled, formed sheet steel components are manufactured from A60 galvanized sheet and subjected to applicable processes outlined below. (*Select from items 1 or 2 below*)
2. Inland locations (12-stage process) – Greater than one (1) mile from salt water and/or similar corrosive environments.
 - a. Alkaline cleaning spray
 - b. Alkaline cleaning – submersion
 - c. Water immersion rinse combo

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- d. Water immersion rinse clean
 - e. Acid immersion
 - f. Neutralizing rinse
 - g. Water immersion rinse clean
 - h. Conditioner immersion
 - i. Zinc phosphate immersion
 - j. Rinse immersion
 - k. Sealer immersion
 - l. Water reverse osmosis rinse immersion
3. Ocean Front/Coastal locations (13-stage process) – Within one (1) mile of salt water and similar corrosive environment.
- a. Zinc metal deposition (Electroplate and/or hot-dip, consult Hope's)
 - b. Alkaline cleaning spray
 - c. Alkaline cleaning – submersion
 - d. Water immersion rinse combo
 - e. Water immersion rinse clean
 - f. Acid immersion
 - g. Neutralizing rinse
 - h. Water immersion rinse clean
 - i. Conditioner immersion
 - j. Zinc phosphate immersion
 - k. Rinse immersion
 - l. Sealer immersion
 - m. Water reverse osmosis rinse immersion

C. Epoxy E-coat Primer

All pickled and pretreated frames and accessories are immersed into an electrostatic (E-coat) bath of PPG epoxy primer to ensure all substrates are encapsulated evenly and completely. Use of spray primers only will not be an acceptable alternative to this process due to benefits from additional cleaning and frame submersion.

1. Permeate spray
2. Permeate rinse
3. Epoxy primer immersion and electrostatic encapsulation
4. Water reverse osmosis rinse
5. Oven-cure, 45 minutes @ 350° F

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D. Epoxy Powder Primer

Following pretreatments and E-coat system, all frames and accessories shall receive an abrasion resistant powder coating prior to final top-coat.

1. Powder is applied electrostatically over cured E-coat to a dry film thickness (DFT) of 2.0-3.0 mils.
2. Parts oven baked at 325° F to completely cure prior to final top coat.
3. Powder coat is intended as an intermediate finish applied prior to the final finish top coat.

E. Ultrathane Polyurethane Top Coat

Following all pretreatments, e-coat and powder abrasion layer, all products shall receive Hope's ultrathane polyurethane finish with touch-up capability, low chalking and fading characteristics, unlimited color matching, and 70,000+ standard colors, including metallics.

F. POWER OF 5 OVERVIEW

1. Combined overall dry film thickness shall be a minimum of 4.6 mils (inland locations) and 7.1 mils (coastal locations).
2. Overall process shall provide full documented compliance with the following criteria:
 - a. SSPC-SP8 for acid pickling
 - b. ASTM D714-02 Paint Blistering Test
 - c. ASTM D4585 Humidity
 - d. ASTM D1654-05 Painted Products in Corrosive Environment
 - e. ASTM B117-03 Salt Spray (Fog) Test
 - f. ASTM G85 Cyclic Fog/ Dry Test (Prohesion)
 - g. ASTM D5894-96 Salt Fog/ UV Painted Metal
 - h. ASTM D4541 Pull Off Strength of Coating Test

2.5 OPERABLE HARDWARE

A. Pivots:

1. Aluminum-bronze pivot with stainless steel pin.

B. Thresholds

1. Threshold shall be as shown (select material from items a or b):
 - a. Aluminum (anodized)
 - b. Bronze (toned)

C. Single Leaf (exterior and interior operation):

1. Lock box fitted with mortise lock with exterior and interior lever handles and escutcheons or rosettes.
2. Interior thumbturn.
3. Exterior key cylinder.
4. Cremone hardware is also available; consult Hope's.

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D. Double Leaf (exterior and interior operation):

1. Active leaf:

- a. Lock box fitted with mortise lock with exterior and interior lever handles and escutcheons or rosettes.
- b. Interior thumbturn.
- c. Exterior key cylinder.

2. Inactive leaf:

- a. Exposed top and bottom bolts.
- b. Dummy lock box with exterior and interior non-operable lever handles and escutcheons or rosettes (optional).
- c. Cremona hardware is also available; consult Hope's.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Door openings shall conform to details, dimensions and tolerances shown on the door manufacturer's approved shop drawings.
- B. Conditions which may adversely affect the door installation must be corrected before installation commences.
- C. The wash down of the adjacent masonry or surrounding substrate must be completed before erection commences to prevent damage to the finish by the cleaning materials.

3.2 INSTALLATION

- A. Doors specified under this section shall be installed by experienced personnel.
- B. Install doors in openings in strict accordance with approved shop drawings.
 1. Set sub-sills in sealant making sure they are level in opening, install units plumb, level and true to line, without warp or rack of frames.
 2. Anchor units securely to surrounding construction with approved fasteners.
 3. The exterior joints between the doors, trim and mullions shall be properly sealed watertight with an approved sealant and neatly pointed.
- C. Attach door hardware, as required, and adjust doors to operate smoothly free from twist and to be weathertight when closed.
- D. Attach loose muntin grids per approved shop drawings, if applicable.
- E. Repair any abraded areas of the factory finish.

3.3 CLEANING

- A. Door installer shall leave door surfaces clean after installation and ready to receive glass and glazing. The window installer will not be responsible for final cleaning.

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