



S40/S41/S42 SERIES STEEL DETENTION GUARD WINDOWS SECTION 08651

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included:

1. Furnish all labor and materials to complete the fabrication of detention windows as shown on the architect's drawings and as specified herein. All detention windows covered by this specification shall be fabricated by Hope's Windows Inc., Jamestown, New York, whose name and products are used to establish the standard of workmanship and quality construction required for this project. Other bidders must be approved by the architect at least ten days prior to the bid date, through submission of samples and evidence showing that the bidder has been fabricating detention window products of this type and quality for at least five years. All windows must be domestically manufactured in the U.S.A. All work shall include, but not be limited to, the following.
2. Hot-rolled steel double weatherstripped guard windows with fixed, project, or project out configurations.
3. All window anchors, mullions, covers and trim.
4. Tool-resisting steel detention bars (optional).
5. Stainless steel security screens for operating ventilators (optional).
6. Factory applied Hope's finish.
7. Installation.

B. Related work specified elsewhere:

1. Glass, glazing and glazing materials, Section _____.
2. Perimeter caulking, Section _____.
3. Miscellaneous structural items, Section _____.
4. Anchors built in or encased in concrete, (embedment's), Section _____.

1.2 QUALITY ASSURANCE

- A. Manufacturer shall have not less than (5) years experience in the fabrication of steel detention windows and be a member of The Steel Window Institute (SWI). Installation of windows shall be done by experienced window installers.
- 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 0.03 CFM/SQFT with differential pressure across window units of 1.57 PSF (In-swing) or 6.24 PSF (Out-swing).
 2. Water penetration test:
 - a. Products must be independently lab tested and meet or exceed ASTM E331.



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- 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 units of 2.86 PSF (In-swing) or 6.24 PSF (Out-swing). Pressure determined per job specific design pressure.
 - c. When weeps are required, ASTM E547 cyclic testing standard with differential pressure across window units of 2.86 PSF (In-swing) or 6.24 PSF (Out-swing) shall be standard. Pressure determined per job specific design pressure.
3. Field testing criteria (when applicable) shall be in accordance with AAMA 502-12, procedure B
4. 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)
- 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 within our systems.
 2. Dimensioned elevations showing window opening and window sizes.
 3. The manufacturer shall not commence any work until shop drawings have been returned "approved" with a stamp or signature.
 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 1 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 samples matching required scope.
 2. Applicable test reports as outlined in Quality Assurance Section 1.2
 3. List of (5) recently completed projects of similar size and scope.



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2.2 MATERIALS

- A. The guard frame sections, muntins, and glazing frame sections shall be hot-rolled steel sections.
 - 1. The guard frame sections shall be 1-3/4" deep front to back and weight not less than 2.3 pounds per lineal foot.
 - 2. The muntins shall be bulb tee type 1-3/4" deep front to back, with a minimum 1-1/16" wide sight line flange, and weigh not less than 1.9 pounds per lineal foot.
 - 3. Glazing frame sections shall be 1-3/4" or 1-7/8" deep front to back and weight not less than 2.1 pounds per lineal foot.
 - 4. Perimeter glazing frames and ventilator profiles shall have glazing rebates providing an unobstructed glazing surface of at least 3/4".
- B. 1/2" x 1/2" square mild steel spacer bars.
- C. **Optional:** 1/2" x 1/2" square tool-resisting steel detention bars.
- D. Glazing beads shall be **formed from 12 gauge galvanized or extruded from 6063-T5 aluminum.**
- E. Weatherstripping shall be flexible silicone.
- F. Operable Hardware (**select from the following**):
 - 1. **Project-In Ventilators:**
 - a. **Fastener: Bronze cam fastener; or bronze spring catch for ventilators beyond reach.**
 - b. **Ventilators shall be hung on heavy-duty stainless steel four bar hinges with brass friction shoes.**
 - 2. **Project-Out Ventilators with simplex:**
 - a. **Fastener: Bronze cam fastener.**
 - b. **Ventilators shall be hung on heavy-duty stainless steel four bar hinges with brass friction shoes.**
- G. Perimeter covers shall be formed from 12 gauge galvanized steel.
- H. Security and detention screens (option select one)
 - 1. Fixed angle frame
 - a. Frames shall be steel angles formed from 12 gauge steel.
 - b. Steel clamp strip shall be 12 gauge steel.
 - c. Screen cloth shall be stainless steel, Type 18/8, Alloy #304, woven 12 mesh to the inch from 0.028" diameter wire, double crimped. (Option - stainless steel, Type 18/8, Alloy #304, woven 10 mesh to the inch from 0.047" diameter wire, double crimped).
 - 2. Operable steel detention screens (**optional**) are available.
 - a. Consult Hope's for details and specifications.
- I. Anchors shall be fabricated from structural angles and/or flats with a minimum leg thickness of 7ga.
- J. All screws shall be tamper-resistant plated steel or stainless steel.



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K. Finishing:

1. Cleaning
2. Pre-treatment with hot-dip galvanized.
3. Bush-Off Blast Cleaning
4. Hope's standard epoxy powder primer.
5. Polyester Powder Top Coat or Ultrathane Polyurethane Top Coat.

2.3 FABRICATION

A. Fabricate windows in accordance with approved shop drawings.

B. Frame corners and muntin to frame intersections shall be mitered or coped & then solidly welded. Intersections of muntins shall be mechanically interlocked to obtain maximum strength without bending or distorting either section. All guard frame and muntin intersections shall have 1/16" joints provided across inside and outside faces which, after assembly, shall be deep welded solid. Welds may project not more than 1/16" and shall not be ground, except where glazing frames are attached. Maximum muntin spacing shall not exceed 6-3/8" x 9-3/8" on centers.

C. When specified 1/2" x 1/2" square tool-resisting steel detention bars shall be furnished as follows:

1. Vertical - The detention bar is welded to the exterior face of the vertical bulb tee muntin. In addition, the detention bar overlaps and is welded to the exterior face of the perimeter guard frame section.
2. Horizontal - The detention bars penetrate the stem of the vertical bulb tee muntins and perimeter guard frame sections. The detention bars are welded intermittently to the underside of the stem of the horizontal bulb tee muntins and securely welded to the perimeter guard frame sections.
3. All welds attaching the detention bar shall be 1" long, spaced not more than 9" apart.

D. The glazing frame shall be mitered and solidly welded at the corners. The frame and spacer bar shall be factory welded and sealed to the guard frame or muntin grid as one integral unit.

E. Glazing:

1. All windows shall be designed for **inside (with swing-in vents) or outside (with swing-out vents)** 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 wedge and tape in accordance with the tested assembly.
5. Steel glazing beads shall be attached with tamper-resistant screws spaced a maximum of 9" on center.

F. Weatherstrip:

1. All ventilators shall receive continuous double weatherstripping that shall be applied to the integral weatherstrip grooves in the interior and exterior contact surfaces of the frame and ventilator profiles. Weatherstripping that is surface applied or requires additional retainer or requires screws for application shall not be acceptable.

G. Operable Hardware (**Select from the following**):

1. **Project-In ventilators:**

- a. **Ventilators shall be hung on heavy-duty stainless steel four bar hinges, having friction maintained by a sliding brass shoe with screw adjustment.**



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- b. Provide two fasteners per ventilator where sash width exceeds 4'-8".
 - c. Optional: limit device to restrict degree of opening.
- 2. Project-out ventilators:
 - a. Ventilators shall be hung on heavy-duty stainless steel four bar hinges, having friction maintained by a sliding brass shoe with screw adjustment.
 - b. Provide two fasteners per ventilator where sash width exceeds 4'-8".
 - c. Optional: limit device to restrict degree of opening.
- H. Security and detention screens:
 - 1. Fixed angle frame.
 - a. Frames shall be welded solid at corners and welds dressed smooth.
 - b. Secure screen cloth to frame using special security screws spaced 4" on centers, which penetrate the frame, screen cloth and clamp strip.
 - c. The screen frame and clamp strip shall be factory finished to match the window finish.
 - d. Screen mesh shall be unfinished stainless steel
 - I. The 12 gauge covers shall be coped and notched, as required, for installation into the opening as four individual pieces.
 - J. Anchors shall be located a maximum of 18" on center, minimum of 2" long and fabricated from 7ga steel.
 - K. All removable covers or trim, either exterior or interior, shall be field attached with tamper-resistant screws, spaced not more than 9" on centers at the interior and spaced not more than 12" on centers at the exterior.

2.4 FACTORY FINISHING

- 1. Cleaning:

All hot-rolled steel profiles must be acid pickled to white metal as defined by SSPC – SP8 creating a pristine, white metal substrate which is paramount to achieving ultimate finish performance.
- 2. Pretreatment:

Following welding and all machining operations, hot-rolled products and accessories are subjected to the following pretreatment process.

 - a. Hot-Dip Galvanize.
 - b. Parts are cleaned and immersed in a molten pool of pure zinc per ASTM A123 to create a dry film thickness (DFT) of 4 – 8 mils of cathodic protection.
 - c. Quality Control.
 - d. Mechanical Cleaning.
- 3. Brush-Off Blast Cleaning:
 - a. Galvanized parts shall be brush-off blast cleaned in accordance with SSPS-SP16 to profile surface prior to primer application.
 - b. All Parts shall be oven heated prior to finishing to prevent outgassing through epoxy primer.
- 4. Epoxy Powder Primer:



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Following pretreatment and brush-off blast cleaning all parts shall receive an abrasion resistant epoxy powder coat to ensure ultimate substrate protection. Epoxy powder primer is intended as an intermediate finish applied prior to the final finish top coat.

- a. Within 12 hours of hot-dip galvanizing pretreatment all frames and accessories shall receive an epoxy powder primer for abrasion resistance.
 - b. After hot-dip galvanizing has been cleaned, brush-off blasted, and oven outgassed – epoxy powder primer is applied electrostatically to a dry film thickness (DFT) of 2.0 – 4.0 mils.
 - c. Parts are oven baked in preparation of top coat application.
5. Polyester Powder Top Coat or Ultrathane Polyurethane Top Coat:
The top coat defines the final stage to the overall aesthetics and performance of the finished product.
 - a. Polyester powder top coat shall be applied immediately over epoxy powder primer.
 - b. Powder top coat is electrostatically applied to a dry film thickness (DFT) of 2.0 – 4.0 mils.
 - c. Parts are oven baked to fully cure.
6. Finish Overview:
 - a. Combined overall dry film thickness (DFT) of hot-dip galvanizing, epoxy primer, and polyester powder top coat or Ultrathane Polyurethane Top Coat shall be between 7.0 – 16.0 mils.
 - b. Overall process shall provide full documented compliance with the following criteria (as applicable):
 - i. Acid Pickling: SSPC-SP8.
 - ii. Hot Dip Galvanize: ASTM A123.
 - iii. Adhesion: ASTM D3359, no loss.
 - iv. Hardness: ASTM D3363 (pencil), H min.
 - v. Salt Spray: ASTM B 117, passes 3000 hrs.
 - vi. Humidity: ASTM D2247, 3000 hours, few #8 blisters.
 - vii. Impact Resistance (3mm): ASTM D2794, no loss.
 - viii. Color Retention: ASTM D2244, 5 year less than or equal to 5 delta E.
 - ix. Chalk Resistance: ASTM D4214, #8 rating.
 - x. Gloss Retention: ASTM D 523, greater than or equal to 30 percent retention.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Window openings shall conform with details, dimensions and tolerances shown on the window manufacturer's approved shop drawings.



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- B. Conditions which may adversely affect the window installation must be corrected by the general contractor before installation commences.

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 windows plumb, level and true to line without warp or rack of frames or ventilators.
 - 2. Anchor windows securely to surrounding construction with minimum 1" long welds at anchor points. Maximum distance between weld points will be 18".
 - 3. The exterior joints between the windows, trim and mullions shall be properly sealed watertight with an approved sealant and neatly pointed.
 - 4. All windows shall be completely checked and adjusted after installation and before glazing to assure proper fit of ventilator to frame and to assure the operating mechanism works freely and satisfactorily.
- C. Install security or detention screens (if specified).
- D. Repair any abraded areas of the factory finish.

3.3 CLEANING

- A. Window installer shall leave the window surfaces clean after installation and ready to receive glass and glazing. The window installer shall not be responsible for final cleaning.
- B. Any protection necessary due to cleaning adjacent materials shall be the responsibility of the general contractor.