



S50 SERIES STEEL HINGED AIR VENT DETENTION 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. Steel detention windows having a vision area and top hinged protected air vents. The windows shall have vertical steel detention bars spaced approximately 6" on center, concealed within the frame. The vertical steel detention bars shall penetrate horizontal steel detention bars concealed within the head and sill of the frame to form an integral detention grid. Vents shall be protected within the frame of the detention window and be controlled by a concealed operating mechanism. Ventilators shall provide indirect ventilation through a perforated grille, which is an integral portion of the interior side of the window frame.
3. All detention window anchors, mullions, covers and trim.
4. Factory applied Hope's finish.
5. Insect or detention screens (optional)
6. 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, (embedments), 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. Allowable tolerances: Size dimensions + 1/16 inch.
- C. Installation of windows shall be done by experienced window installers.
- 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 0.05 CFM/SQFT with differential pressure across window unit of 1.57 PSF.



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2. Water penetration test:
 - a. Products must be independently lab tested and meet or exceed 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 6.0 PSF. Pressure determined per job specific design pressure.
3. Impact Test:
 - a. Meets or exceeds ASTM F1592 "Standard Test Methods for Detention Hollow Metal Vision Systems"
 - b. Glazing Test – The glazing and panels shall remain in place. No damage to the extent that forcible entry can be achieved.
 - c. Frame Test - No welded joints or the entire frame joint shall completely separate.
 - d. The wall anchoring shall retain the frame in place throughout the test procedure to the extent that forcible entry cannot be achieved.
 - e. ASTM F1592 is a fixed frame test procedure that measures the ability of the vision system to resist, delay, or prevent escape. While not specifically mentioned, air vent window units will maintain compliance only when interior detention screens are installed behind the interior perforated grille.
4. Tool-resisting steel (when specified):
 - a. Tool-resisting steel conforming to or exceeding ASTM standard specifications A627 and A629.
 - b. Submit test reports from a qualified independent testing laboratory verifying that the window manufacturer's tool-resisting steel is in conformance with ASTM A627 and A629.
5. Field testing criteria (when applicable) shall be in accordance with AAMA 502-12, procedure B
6. 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.



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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.

2.2 MATERIALS

- A. The perimeter framing and removable covers shall be formed from 12 gauge galvanized steel or 14 gauge stainless steel (depending on finish requirements).
- B. The interior integral perforated grille shall be fabricated from 12 gauge galvanized steel or 14 gauge stainless steel (depending on finish requirements).
- C. The exterior integral perforated grille shall be fabricated from 10 gauge galvanized steel or 10 gauge stainless steel (depending on finish requirements).
- D. Ventilator shall be formed from 12 gauge galvanized steel or 14 gauge stainless steel (depending on finish requirements).
- E. **Optional:** horizontal and/or vertical tubes, are available to receive and conceal steel detention bars without dividing the glazing area. Tubes shall be fabricated from 11 gauge steel, 12 gauge galv. steel, .09" aluminum, or 14 gauge stainless steel.
- F. **Optional:** detention bars of 7/8" or 1" round and 1/4" x 2-1/2" flat tool-resisting steel conforming to ASTM specification A627.
- G. Glazing beads shall be formed from 12 gauge galvanized steel or 14 gauge stainless steel
- H. The power shall be a worm gear self-locking type with bronze bearings and provide continuous operation in either direction.
- I. All linkage arms shall be steel not less than 3/16" x 7/8" and located within the sill box.
- J. All connecting bars shall be not less than 3/16" x 7/8" and located within the sill box.
- K. Brass or bronze bearings shall be provided at all wearing points on the pivotal bars and linkage mechanism.
- L. Anchors shall be fabricated from steel with a minimum thickness of 3/16".
- M. Security and detention screens:
 - 1. Interior integral perforated grille frame.



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- a. The screen frame is the interior integral perforated grille and shall be formed from 12 gauge steel or 14 gauge stainless
 - b. Steel clamp strip shall be 12 gauge steel or 12 gauge stainless 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).
- N. Stainless Steel Insect Screens (Optional):
1. Frames shall be roll-formed 20 gauge stainless steel.
 2. Mesh is available in several types of material: Bronze mesh - .011 diameter wire woven to 14x18, Fiberglass mesh - .011 diameter wire woven to 16x18, Stainless mesh - .007 diameter wire woven to 17x17, Bright Aluminum mesh - .011 diameter wire woven to 16x18, and Charcoal Aluminum mesh - .011 diameter wire woven to 16x18

2.3 FABRICATION

- A. Fabricate windows in accordance with approved shop drawings.
- B. Frame members shall be coped and welded at corners the full depth of the frame for maximum strength and weathertightness and exposed face welds dressed smooth.
- C. Optional horizontal and/or vertical imposts or tubes shall be securely welded to the frame for maximum strength and weather tightness, with all welds dressed smooth or concealed.
- D. Anchors shall be located a maximum of 18" on center, minimum of 2" long and fabricated from 7ga steel.
- E. All removable covers, grilles, 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.
- F. Horizontal or vertical 7/8" or 1" round steel detention bars shall penetrate and be securely welded to the concealed 1/4" x 2 1/2" flat detention bars to form an integral detention grid.
 1. Option: The 7/8" or 1" round detention bars shall be equipped with a feature that allows the rod to rotate freely and discourages a device from cutting into the bar.
- G. Operable Hardware:
 1. The ventilator shall be mechanically attached to the ventilator frame with continuous stainless-steel hinges
 2. The linkage arms of the ventilator shall be connected to bell cranks by means of an adjustable link which provides for adjustment of the ventilators.
 3. A bell crank shall be welded to each end of the 3/4" diameter power shaft.
 4. The 3/4" power shaft shall be connected to the power with an overload safety device.
 5. The power unit shall be located and concealed within the sub-frame of the window.
 6. Opening and closing of the ventilators shall be accomplished by rotating the operating cone or crank in either direction.
 7. The 3/4" diameter shaft, power unit, bell cranks and adjuster links shall be removable from the window.
- H. Weatherstripping
 1. Shall be factory applied in the same plane around the interior contact surface of the ventilator frame.



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I. Glazing:

1. All windows shall be designed for outside 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. Glazing beads shall be attached with tamper-resisting screws spaced a maximum of 9" on center.

J. Security and detention screens:

1. Interior integral perforated grille screen frame.
 - a. The interior integral perforated grille acts as the screen frame.
 - b. Secure screen cloth to frame using special security screws spaced 4" on centers, which penetrate the perforated grille, 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

K. 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 have attachment and removal from the exterior. See screen section 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-rolled, formed sheet steel components are manufactured from A60 galvanized sheet and subjected to applicable processes outlined below.
2. 12-stage process
 - 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



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- h. Conditioner immersion
 - i. Zinc phosphate immersion
 - j. Rinse immersion
 - k. Sealer immersion
 - l. Water reverse osmosis rinse immersion
- 3. 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.

 - a. Permeate spray.
 - b. Permeate rinse.
 - c. Epoxy primer immersion and electrostatic encapsulation
 - d. Water reverse osmosis rinse
 - e. Oven-cure, 45 minutes @ 350° F
- 4. Ultrathane Polyurethane Top Coat.
 - a. Following all pre-treatments, all products shall receive Hope's ultrathane polyurethane finish with touch-up capability, low chalking and fading characteristics. Select from Hope's Correctional Color Palette. Color matching is available upon request, some colors may require added cost. Consult your Hope's Representative for selection assistance.
- 5. Finish Overview:
 - a. Combined overall dry film thickness (DFT) shall be a minimum of 1.8 – 2.5 mils.
 - b. Overall process shall provide full documented compliance with the following criteria:
 - i. Acid Pickling: SSPC-SP8.
 - ii. Paint Blistering: ASTM D714.
 - iii. Humidity: ASTM D4585.
 - iv. Painted Products in Corrosive Environment: ASTM D1654.
 - v. Salt Spray (Fog): ASTM B117.
 - vi. Cyclic Fog/Dry (Prohesion): ASTM G85.
 - vii. Salt Fog/UV Painted Metal: ASTM D5894.
 - viii. Pull Off Strength of Coating: ASTM D4541

C. 2B Finish (Stainless Steel)

- 1. Acid cleaning all welds to remove burn marks
- 2. Water reverse osmosis rinse



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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.
- 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.