SECTION 085663 STEEL DETENTION WINDOW

Revise this Section by deleting and inserting text to meet Project-specific requirements.

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

(Hot Dipped Galvanized Hot Rolled Steel) See additional information at the end of this section.

This spec section is used for Hot Dipped Galvanized Hot Rolled Steel Security Windows in correctional or mental health facilities made primarily of steel (not aluminum, wood, nor other materials), including DOCCS Standard Type 1, 2, and 4 Windows. Selection of DOCCS window types and details must be confirmed with an OGS Div. of Design Detention specialist during the design phase. Steel detention windows using A60 galvanized sheet steel should use OGS Spec Section 085662. Steel windows for other non-security environments should use OGS Spec Section 085123.

OGS PM to acquire the services of contractor to pull sample a window at each different construction type location prior to 100% DOCCS submission.

1. GENERAL
	* + 1. RELATED WORK SPECIFIED ELSEWHERE
				1. Built-In Anchors: Section 055000.
				2. Joint Sealants: Section 079200.
				3. Glass and Glazing: Section 088100.
				4. Security Glass and Glazing: Section 088853.
				5. General Conditions: Section 007213.
			2. MANUFACTURERS

Manufactures listed in paragraph below are acceptable when they can provide a complete window system as required per specific project requirements. This includes weather stripping, hardware and cap bead requirements.

* + - * 1. Manufacturers:

Basis of Design: Hope’s Windows, Inc., 84 Hopkins Avenue, P.O. Box 580, Jamestown, New York 14702. Phone (716) 665-5124; [www.hopeswindows.com](http://www.hopeswindows.com).

Optimum Window Mfg. Corp., 28 Canal Street, Ellenville, New York 12428, Phone (845) 647-1900; [www.optimumwindow.com](http://www.optimumwindow.com).

Or equal.

* + - 1. REFERENCES
				1. Except as shown or specified otherwise, the Work of this Section shall meet the requirements of the following:

Steel Window Specifications by the Steel Window Institute (SWI).

Structural Welding Code - Steel, AWS D1.1 and Structural Welding Code - Sheet Steel, AWS D1.3, as applicable, by the American Welding Society (AWS Codes).

* + - 1. WINDOW TYPES AND DESCRIPTIONS

Modify paragraphs below when windows are placed adjacent to each other as multiple window units. Provide additional editing throughout this specification, particularly at fabrication and operation descriptions.

Windows in paragraph below are based on Hope’s S41 Series Steel Maximum Detention Guard Windows with Ventilator (Operable Window). Edit type of ventilator to reflect project requirements. Use only at locations with areas of continual inmate contact only.

* + - * 1. Type 1 Detention Windows: Steel maximum security detention windows with fully welded frames, horizontal and vertical grid steel tee muntins, tool resisting steel detention bars, and bottom pivoted in-swing or top hinged in-swing ventilators, and a fixed angular safety screen is located to the exterior covering the ventilated area.

Windows in paragraph below are based on Hope’s S41 or S42 Series Steel Medium Detention Guard Windows with Project-In Ventilator (Operable Window). Edit type of ventilator to reflect project requirements.

* + - * 1. Type 2 Detention Windows: Steel medium security detention windows with fully welded frames, horizontal and vertical grid steel tee muntins provided with bottom pivoted out-swing or top hinged out-swing ventilators with interior in-screen wickets, and a fixed angular safety screen is located to the interior covering the ventilated area.

Windows paragraph below are based on Hope’s S40 Series Maximum or Medium Detention Fixed Guard Windows.

* + - * 1. Type 4 Detention Windows: Fixed steel maximum or medium security detention windows with fully welded frames, horizontal and vertical grid steel tee muntins without detention screens.
			1. PERFORMANCE REQUIREMENTS
				1. Air Leakage: Meet or exceed ASTM E 283, Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors. Maximum allowable air infiltration and exfiltration 1/2 cfm/lin ft of crack perimeter when subjected to an exterior to interior static test pressure difference of 1.57 psf across window unit.
				2. Water Penetration: Meet or exceed ASTM E 331, Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference. No water leakage for 15 minutes when window is subjected to a rate of flow of 5 gal/sq ft/hr with test pressure difference across window unit of 2.86 psf.

Use paragraph below only when Window Type 1 and/or Window Type 4 intended for maximum security facilities are used.

* + - * 1. For Type 1 Windows, tool-resisting steel shall meet or exceed ASTM A627-03, Grade 4. Submit test reports from a qualified independent testing laboratory verifying that the window manufacturer’s tool-resisting steel is in conformance with the requirement above.
			1. SUBMITTALS

(Provide submittal index. Organize submittal in the order listed below in this article and article G)

* + - * 1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Submittals related to this specification section shall be forwarded from the Contractor and/or his agent(s) as complete submittal packages. All information required from this section, including Installer’s Qualifications, Shop Drawings, Rough Opening Dimensions, Product Data, Samples, and Quality Control submittals shall be submitted as one complete package. Partial or incomplete submittal packages will be rejected.
				5. Shop Drawings: Show window types, quantities, fabrication details, and connections to adjacent construction, including existing jamb, head, and sill conditions, and all associated dimensions. Include documentation of rough in field dimensions obtained for each window location. Include details of screens, hardware, insulation, and glazing details.
				6. Rough Opening Dimensions: Provide a completed ‘Rough Opening Dimensioning Verification Chart’ documenting all windows (chart attached at the end of this specification). This informational submittal will be reviewed and returned as ‘Acknowledged’ only as the Contractor is solely responsible for fully verifying and coordinating this data.
				7. Product Data: Catalog sheets, specifications, and installation instructions.
				8. Samples:

One complete window unit of each window type, with specified accessories. This sample, if approved, will be available for Contractor pickup and may be used in the Work.

Use subparagraph above for unique projects. Delete screen from subparagraph below if none required.

Sample of screen: 6” x 6” size

For DOCCS client, choose appropriate hardware type/finish below after discussing with client. Spring catch required for DOCCS projects involving Type 1 and Type 2 windows.

Hardware: Each item required.

Spring catch (By Jamestown Bronze or Equal). Brass, fully machined.

Lever Handle (Hopes ’60-2’ fastener’ type, antique bronze, satin white, bronze).

Removable springs, removable parts or disassembly without the use of tools is unacceptable.

Color Samples for Factory Prefinished Windows: Manufacturer’s color for the specified finish listed in Section 2.01, H. of this specification.

* + - * 1. Quality Control Submittals:

Manufacturer’s Qualifications Data:

Names and addresses of 5 similar projects that have been in operation for not less than 3 years producing custom steel windows.

Manufacturer’s listed in Section 1.02 are exempt from this submittal requirement.

Installers Qualifications Data:

Name of each person who will be performing the Work and their employer's name, business address and telephone number.

Names and addresses of 3 similar projects that each person has worked on during the past 3 years.

Window manufacturer’s installer certification.

Test Reports:

Certified air leakage and water penetration test reports for each type of window unit required. Testing shall have been completed on window system being submitted.

Use subparagraph below if Window Type 1 and/or Type 4 intended for maximum security facilities are used.

Tool-Resisting Steel: Certified test reports verifying tool resisting steel conforms to ASTM A 627-03, as applicable.

* + - * 1. Contract Closeout Submittals:

Operation and Maintenance Data: Two copies of owner’s manual, including instructions for cleaning windows and touching-up finish.

* + - * 1. Re-Evaluation Fee: In accordance with the General Conditions 07213 Article 4.7. In accordance with Article 4.7 of the General Conditions, a re-evaluation processing fee of $250 will be levied against the Contractor for each re-evaluation of a Submittal or Submittal Package submission that was returned for failure to comply with the submittal requirements relative to completeness, content, or format.
			1. QUALITY ASSURANCE
				1. Detention Windows Manufacturer’s Qualifications: The manufacturer shall be regularly engaged in the production of custom steel windows, shall have furnished steel windows for 5 projects of similar scale to that of this project, and that have been in operation for not less than 3 years. Window manufacturer shall be subject to the approval of the Director.
				2. Installers Qualifications: The persons installing the windows and their Supervisor shall be personally experienced in steel window work and shall have been regularly employed by a company that installs steel detention windows as a primary source of work for a minimum of 3 years.
				3. Testing Agency:

Air infiltration and water penetration tests shall be performed by a qualified independent testing laboratory.

Use subparagraph below if Window Type 1 and/or Type 4 intended for maximum security facilities are used.

Tool-resisting steel certification tests shall be performed by a qualified independent testing laboratory.

* + - * 1. Field Dimensioning and Existing Conditions Verification:

Field verify all existing window opening conditions, including all rough opening dimensions. Document dimensions and confirm how variations in rough opening dimensions will be incorporated into selection of final window sizes.

Submit summary of findings, including any conditions which deviate with Contract Drawings.

‘Window Investigation Pull’ should be initiated by OGS prior to the 100% submission. Existing window condition to be documented by PM or consultant and findings incorporated into 100% documents. Obtain digital photographs to document the existing window opening adequate to fully document the interior and exterior conditions of the remaining construction. Contractor shall provide digital photos in an electronic format acceptable to the Director’s Representative.

* + - * 1. Project Benchmark Installation:

Prior to installation of windows, fully remove one existing window unit at each location where a new window type is scheduled to be provided. This shall include removal of the existing window unit(s), including removals of any hazardous materials, structural items, or other associated components required in conjunction with the Work. The existing window selected for removal must not create a security breech and the locations selected shall be approved by the Director’s Representative prior to removal of any window or associated component.

Weather tightness, energy efficiency, and security shall be maintained for the existing window opening at designated benchmark installation locations.

After approval by the Director’s Representative, install a single window unit of each window type scheduled for the project, in its/their final location(s) where existing window investigation pull occurred. Install window(s) with all materials, fasteners, welds, joints, interior and exterior sealants, hardware, and all other accessories required for a complete window system installation.

Do not start the remainder of the window installation until the Director’s Representative has approved each benchmark window installation.

Approved windows will be the standard of workmanship required for all windows installed in like conditions. Failure to maintain this standard will be cause for rejection of the Work.

Maintain approved windows until all Work has been installed and approved.

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Deliver windows in sturdy, protective crates, or containers.
				2. Store and handle windows in a manner that will not cause damage to the finish.
			2. MAINTENANCE MATERIALS
				1. Touch-up Kit: For every 20 windows installed (and fraction thereof), furnish detention window manufacturer’s factory finish touch-up kit for the factory finish on windows. Store touch-up kits at the site where directed.

Label kits to identify locations used.

* + - * 1. Security Fastener Tools: Furnish two (2) sets of tools for installing, adjusting, and/or removing security fasteners.
1. PRODUCTS
	* + 1. MATERIALS
				1. Guard Frames, Muntins, Ventilator Frames, Ventilator Jambs, and Sill Rails composed of hot dipped galvanized hot rolled steel sections. Operable vent portion of frames shall be electro-galvanized per ASTM B633-11.
				2. Perimeter head, jamb, sills and muntins shall be hot-rolled steel sections, with hot dipped galvanized zinc coating in accordance with ASTM A123. Perimeter head, jamb, and sill shall weigh not less than 2 pounds per lineal foot and muntins shall weigh not less than 1.85 pounds per lineal foot. Frame members shall have profiles and dimensions as indicated on drawings.
				3. Glazing Beads: Formed steel glazing beads, screw-on type.

Drill holes for screws before finishing. Space holes one inch from ends and 6 inches on center.

Finish: Match window frame color specified below.

Use paragraph below when only with Type 1 and 2 Windows.

* + - * 1. Weatherstripping:

Q-Lon Weatherseal (TM)

Q-LON® Foam Seals, QFS 375 by Schlegel.

Below are Antiligiture Type, to be used on DOCCS projects.

0.375" Silicone Teardrop Self-Adhesive Weatherstrip - Z488 BY Trademark Hardware.

0.5" Silicone Teardrop Self-Adhesive Weatherstrip - Z188 BY Trademark Hardware.

Or equal.

Modify paragraph below when multiple adjacents are used. Delete paragraph below when only Window Type 4 is used.

Edit ventilator opening (limit device) based on degree required for minimum ventilation per code and safety concerns.

* + - * 1. Hardware:

Operating Arms: Solid bronze, OR steel.

Pivots: Steel pivot leafs with brass pins.

Friction and Limit Devices: Steel pivot or butt type hinges for interior bottom pivoted and exterior top hinged ventilators, with steel pivot side arms with bronze friction shoes to limit ventilator opening to 45 degrees.

Exposed Hardware: Solid Brass or Bronze, tumbled and oxidized to match US20 finish, and lacquered.

Use subparagraph below with sills more than 6 feet above finished floor.

Remote Window Operators: Manual controlled surface mounted window operators designed for ventilators indicated.

Controls: Crank operated rotary control box delivering forward and backward motion to a steel flexible cable traveling through surface mounted steel conduit.

Crank Handle: Removable.

* + - * 1. Anchors: Perimeter anchors shall be 1-1/4 inch x 1-1/4 inch hot-rolled steel angles or formed plate, both 3/16 inch thick.

Use paragraph below only with Type 1 and 2 windows.

* + - * 1. Angular Safety Screen:

Screen frame: Angle shape formed of A60 hot-dip process zinc coating sheet steel not less than #12 gauge.

Screen Cloth Clamping Plate: Formed of sheet steel not less than #12 gauge.

Screen Cloth:

Use subparagraph below on all SHU units and/or all medical buildings with Type 1 and Type 2 windows.

Unless Otherwise Indicated: 0.054 inch diameter #304 stainless steel wire 8 x 8 double fold and hem the mesh at frame engagement.

Use subparagraph above or below.

Unless Otherwise Indicated: 0.028 inch diameter #304 stainless steel wire 12 x 12 double fold and hem the mesh at frame engagement.

Use paragraph below with Type 2 windows.

Discuss option with DOCCS client prior to including.

Wickets: Horizontal sliding unit made from screen cloth and perimeter frame matching requirements specified above.

* + - * 1. Paint Finish:

Pretreatment - Zinc phosphate (bonderized) treated in a multi-stage process or equal.

– E-COAT, PPG powercron 8000 or equal

Finish Coat - PPG Polyurethane or equal.

Color in paragraph below is NYS DOCCS standard unless matching an adjacent window color. Verify approval of final color with team leader.

Custom Color: Medium Bronze MP36366 (Hopes/Matthews).

* + - * 1. Fasteners: Stainless steel, unless otherwise specified.

Exposed Fasteners: Stainless steel Torx vandal resistant truss head for exposed screws and bolts, finish and color to match windows.Installed fasteners through painted frames shall match color and finish of exposed side of material being fastened.

* + - * 1. Sealing Mastic: Non-staining sealant material recommended by window manufacturer.

Use paragraph below for windows without bars or grill as part of the fully welded window frame system at fixed window location.

* + - * 1. Cap Bead: at both exterior and interior of window units without bars and grills as part of the fully welded window frame system.
				2. Rigid Insulation: Rigid cellular polyurethane or polyisocyanurate thermal insulation boards surfaced with aluminum foil on both sides; minimum aged R value of 3.6 @ 75 degrees F per 1/2 inch thickness meeting the requirements of ASTM C591-11.
				3. Rigid Insulation Adhesive: Type recommended by the rigid insulation manufacturer.
				4. Open-Cell Polyurethane Foam Insulation: At head and jamb only, ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84, compatible with adjacent rigid insulation.
				5. Cold Galvanizing Compound: Single component compound giving 93 percent pure zinc in the dried film and meeting the requirements of SSPC-Paint 20 (rev. 2002).

Use subparagraph below only with Type 1 windows.

* + - * 1. Tool-Resisting Steel: Homogeneous tool-resisting steel.

Flat Bars and Shapes: ASTM A627-03.

* + - 1. FABRICATION
				1. Fabricate windows in accordance with approved shop drawings.
				2. All formed frame members and muntins shall have detailed profile shapes and dimensions as indicated on drawings.

Use subparagraph below only with Type 1 and 2 windows.

* + - * 1. Ventilator Sections: Hot rolled steel with integral flanges providing parallel double contact surfaces around perimeter of each ventilator.

Fabricate ventilator sections with a continuous integral dovetail groove located on the interior contact surface for the reception of weatherstripping.

Aluminum bedding channels at ventilators are not acceptable.

Use subparagraph below only with Type 1 windows. Delete Item 6 below when wickets are not used.

* + - * 1. Angular Safety Screen:

Screens shall be fixed, permanently fastened, and fabricated not to interfere with ventilator operation.

Provide Angular Safety Screens at all ventilators unless specifically indicated otherwise.

Angle frame sections shall be solidly welded at corners and all face and contact surfaces dressed smooth.

Double fold and hem the screen cloth at the frame edge and securely attach with #10 Torx Taptite truss head plated steel tamper resistant screws, spaced 4 inches on centers, 1 inch from ends, which penetrate the angle frame, wire cloth and clamp plate.

shall be field attached with #10 screws, spaced 9 inches on centers and 1 inch from ends.

To discuss the option below with client prior to including for Type 1 and 2 Windows. Would require outswing with screen on interior or choose different window type. DOCCS client prefers not to use wickets if possible. They get stuck, break, and are a possible weapon concern. Use subparagraph below when wickets are approved.

Wickets: Unit shall be provided with interior and exterior perimeter steel flanges adequately sized to mechanically fasten screen frame flange to window frame with Torx tamper-resistant screws. Screen cloth shall be tack welded and sandwiched between flanges. Unit shall be non-binding and slide with minimal resistance. Unit shall utilize ¼” diameter, stainless steel rod guide tracks.

Use the terms ‘ventilators’ and ‘angular safety screens’ in the paragraph below with Type 1 and 2 windows.

* + - * 1. Corners of frames, ventilators, and angular safety screens shall be mitered or coped. Exposed and contact surfaces shall be finished smooth and flush with adjacent surfaces.

Corner joints of frames and ventilators exposed to the weather shall be continuously welded and ground smooth on the exposed surface and spot welded on the concealed surface.

Corner joints of angular safety screens shall be continuously welded on the concealed surface.

Check paragraph below. Modify as required.

* + - * 1. Glazing: Windows shall be factory glazed by window manufacturer. Fabricate windows for outside glazing with glazing beads ON THE INTERIOR. Size glazing beads to match glazing rebates specified and to suit glass types specified.

Use subparagraph below only with Type 1 and 2 windows.

* + - * 1. Weatherstripping: Continuous weatherstripping inserted in an integral dovetail groove located in the same plane in the interior contact surface of ventilator sections around the entire perimeter of ventilator. Weatherstripping that relies on screw applied weatherstripping will not be acceptable.
				2. Tolerance for Window Size (height and width) Dimensions: + 1/16 inch.

Use paragraph below when required.

* + - * 1. Mullions: Fabricate to the design and profile shown on the Drawings. Finish mullions and covers to match windows.
				2. Muntin to muntin intersections shall be mechanically interlocked to obtain maximum strength without bending or distorting the sections. Guard frame and muntin intersections shall have 1/16 inch joints provided across inside and outside faces, which after assembly shall be deep welded solid. Welds may project not more than 1/16 inch, except where ventilators and screens are attached. Space vertical muntins not more than 6-3/8 inches on center and horizontal muntins not more than 9-3/8 inches on center.

Use subparagraph below with Type 1 windows.

* + - * 1. At all Type 1 Detention Windows: Locate 1/2 inch square tool resisting steel detention bars as follows.

Vertical: A detention bar shall be welded to the exterior face of each vertical tee muntin stem. The detention bars shall overlap and be welded to the exterior face of the perimeter guard frame section.

Horizontal: A detention bar shall be welded to the underside of each horizontal tee muntin stem and shall penetrate each vertical tee muntin stem. The detention bars shall be welded to the perimeter guard frame section.

Welds Attaching Detention Bars: Minimum 1 inch long, spaced 8 inches on center maximum.

* + - * 1. Anchor Accessories: Fabricate to shape and size, and furnish in quantity, as required to securely install and connect the Work of this Section to the construction shown.
				2. Hardware: Unless otherwise shown or specified, window manufacturer’s standard hardware series produced for use with the particular type of window, location, and screen condition.

Spring Catch (By Jamestown Bronze,174 Hopkins Ave, Jamestown NY,14701 or Equal): Solid brass or bronze. fully machined.

Minimum 9/16” bolt diameter with minimum bolt length of 1-3/4” yielding no less than 3/8” engagement surface. Brass ring pull shall be fabricated no less than 7/32” thick. Clear ring opening shall be minimum 11/16” diameter.

Lever Handle (Basis of Design, Hopes ’60-2’ fastener’ type, antique bronze, satin white, bronze)

Removable springs, removable parts or disassembly without the use of tools is unacceptable.

* + - 1. FINISHING
				1. Guard Frames, Muntins, Ventilator Frames, Ventilator Jambs, and Sill Rails composed of hot dipped galvanized hot rolled steel sections. Operable vent portion of frames shall be electro-galvanized per ASTM B633-11.
				2. Perimeter head, jamb, sills and muntins shall be hot-rolled steel sections, with hot dipped galvanized zinc coating in accordance with ASTM A123. Perimeter head, jamb, and sill shall weigh not less than 2 pounds per lineal foot and muntins shall weigh not less than 1.85 pounds per lineal foot. Frame members shall have profiles and dimensions as indicated on drawings.
				3. After all galvanizing is completed, chemically or mechanically clean all materials to remove mill scale, dirt, oil and other foreign matter. Provide one of the two approved shop finish systems listed below.
				4. Shop Finish System: E-COAT System.

After fabrication; windows, covers, plates, screen frames and glazing beads shall be bonderized in a 13 stage E-COAT process, as a preparation for receiving paint.

After pretreatment, a coat of PPG epoxy primer shall be electro-statically applied. (Type of primer depends on type of paint finish selected.)

After prime coat, a top coat of PPG polyurethane shall be applied.

All concealed steel members and perimeter anchors shall be protected by electro-galvanizing or zinc phosphate and prime painted.

* + - * 1. Shop Finish System: Bonderized and Polyester Powder Coat

Bonderizing: After shot blasting; all materials to be bonderized or pretreated by a four stage process as a preparation for receiving paint, as follows.

High pressure wash with degreaser applied at minimum 150 degrees Fahrenheit.

Warm water rinse.

Zinc or Iron phosphate applied at minimum 130 degrees Fahrenheit.

Warm water rinse with a non-chrome post treatment solution.

Prime Paint: After bonderizing, a coat of zinc rich thermosetting epoxy prime paint shall be applied and oven baked.

Bake at 325 degrees Fahrenheit.

Dry film thickness of primer to be a minimum of 1.5 mils.

Finish Paint: After prime coat, a baked on polyester powder coat finish system shall be applied.

Bake at 410 degrees Fahrenheit.

Total dry film thickness to be a minimum of 3.0 mils.

1. EXECUTION
	* + 1. EXAMINATION
				1. Verification of Conditions: Examine surfaces to receive detention windows for defects that will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected.

Check locations and conditions of required built-in anchors.

* + - 1. INSTALLATION
				1. Install the Work of this Section in accordance with the manufacturer’s printed instructions, except as shown or specified otherwise.

Use subparagraph below only with Type 1 and 2 windows.

Install Angular Safety Screens at all ventilators unless specifically indicated otherwise.

* + - * 1. Anchor window units securely in place, plumb, level, aligned, without warp.

Weld window weld plates to windows and built-in anchors with one inch long welds spaced 9 inches on center maximum.

Weld channel surrounds to interior side of frames with one inch long welds spaced 9 inches on center maximum.

* + - * 1. Seal metal to metal joints, screw heads, and unneeded fastener holes with sealing mastic.

Carefully coordinate spray foam insulations on drawings (head/jam foam, sill/rigid). Confirm and/or edit paragraph below where factory applied insulation may be more easily installed in lieu of spray foam.

* + - * 1. Fill all voids around head, jambs, and sill with spray foam insulation or as indicated on drawings. Insulation shall not interfere with operable hardware or sill weeps.

Use paragraph below if remote window operators are used.

* + - * 1. Locate remote window operators in locations indicated.
			1. ADJUSTING
				1. Touch-up welded and abraded surfaces with a coating of cold galvanizing compound and multiple finish coats to match color and sheen of exposed factory applied finish.

Use subparagraph below only with Type 1 and 2 windows.

* + - * 1. Adjust ventilators and hardware for smooth operation and weathertight closure. Lubricate hardware and other moving parts.
			1. CLEANING
				1. Clean window units promptly after completion of installation.
			2. PROTECTION
				1. Protect installed windows and finish as necessary from adjacent work and cleaning operations.

END OF SECTION 085663

**ROUGH OPENING DIMENSIONING GUIDE – EXISTING WINDOW ELEVATION**

**VIEW LOOKING FROM INTERIOR**



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| HT: | HORIZONTAL TOP |  | VL: | VERTICAL LEFT |  | RL: | RADIUS LEFT\*\* |
| HM: | HORIZONTAL MIDDLE |  | VM:VL:  | VERTICAL MIDDLE\*VERTICAL LEFT |  | RM: | RADIUS MIDDLE\*\* |
| HB: | HORIZONTAL BOTTOM |  | VR: | VERTICAL RIGHT |  | RR: | RADIUS RIGHT\*\* |

\* VERTICAL MIDDLE DIMENSION REQUIRED WHERE WINDOW DIMENSION EXCEEDS 6’-0”

\*\* RADII DIMENSION(S) REQUIRED WHERE WINDOW INCLUDES CIRCULAR OR ROUNDED FRAMES

AUTHOR OF THIS DOCUMENT: SUBMIT THIS CHART (or one similar) AS A PROJECT

 INFORMATION SUBMITTAL

DATE SUBMITTED:



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| HT: | HORIZONTAL TOP |  | VL: | VERTICAL LEFT |  | RL: | RADIUS LEFT\*\* |
| HM: | HORIZONTAL MIDDLE |  | VM: | VERTICAL MIDDLE\* |  | RM: | RADIUS MIDDLE\*\* |
| HB: | HORIZONTAL BOTTOM |  | VR: | VERTICAL RIGHT |  | RR: | RADIUS RIGHT\*\* |

\* VERTICAL MIDDLE DIMENSION REQUIRED WHERE WINDOW DIMENSION EXCEEDS 6’-0”

\*\* RADII DIMENSION(S) REQUIRED WHERE WINDOW INCLUDES CIRCULAR OR ROUNDED FRAMES

The remainder of this document is for information only; not to be included in project specifications.

There are only a few manufacturers of steel detention windows, however, this section has been prepared to allow as much competition as possible for steel detention windows with the basic quality and features we generally require.

Thermal performance of steel windows is close to that of thermally-broken aluminum windows. Thermal expansion of steel windows is half that of aluminum windows, which reduces sealant failure and vent operation problems.

When steel detention windows are used for a project, weatherstripped, factory prefinished windows are required, unless specific project conditions warrant otherwise. If so, please contact the Team Leader.

END OF INFORMATION