

SECTION 08 51 23

STEEL WINDOWS

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Section Includes: Framed fixed glass partitions and doors - fire rated and non-fire rated
 - 1. Steel, type and sizes as shown.
 - 2. Hardware.
 - 3. Accessories including, but not limited to, following:
 - a. Mullions, closures, trim, weather-stripping, covers, insect screens, anchors, clips, fasteners, and other components necessary for fabrication and installation complete of windows as specified.

1.2 RELATED WORK:

- A. Sealing Joints: Section 07 92 00, JOINT SEALANTS.
- B. Glazing: Section 08 80 00, GLAZING.
- C. Finish Color: Section 09 06 00, SCHEDULE FOR FINISHES.

1.3 QUALITY CONTROL

A. QUALIFICATIONS:

- 1. Approval is required of products or service of proposed manufacturer, suppliers and installers, and will be based upon submission by Contractor of certification that:
 - a. Manufacturer who regularly and presently, manufactures and installs steel window and door units and related accessories as one of its principal products.
 - b. Accessories required for doors shall be manufacturer's standard or those of other manufacturers regularly engaged in making window accessories and acceptable to window manufacturer.
 - 1) Items shall be of materials which shall be compatible with balance of window unit material, and construction shall be that which shall give desired functional service.
- 2. Installer: Approved in writing by manufacturer.

1.4 SUBMITTALS:

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish following:
- B. Product Data: Furnish for each type of window required, including:

1. Construction details and fabrication methods.
 2. Profiles and dimensions of individual components.
 3. Data on hardware, including sweep lock, keeper, lift handles, accessories, and finishes.
 4. Recommendations for maintenance and cleaning of window surfaces.
- C. Shop Drawings: Furnish for each type window included in project.
1. Layout and installation details, including anchors, support framing and sheet metal trim members.
 2. Elevations of continuous work at 1:50 (1/4 inch) scale and typical window unit elevations at 1:20 (3/4 inch) scale.
 3. Full-size section details of typical composite members, including reinforcement.
 4. Hardware.
 5. Accessories.
 6. Glazing details.
 7. Color charts for standard finishes and sealants.
- D. Samples:
1. Typical sash corner.
 2. Typical muntin section.
 3. For Initial Color Selection: Submit samples of each specified finish on 300 mm (12 inch) long sections of window members.
 4. Hardware.
- E. Quality Control Submittals:
1. Test Reports: Window manufacturer provide certified test report from a qualified independent testing laboratory engaged in testing windows to verify that his steel window assembly has been tested in accordance with specified test procedures and products comply with these minimum test performance characteristics indicated. Test reports shall have been made within current year.
 2. Manufacturer's Certificates:
 - a. Stating steel members have been given specified thickness of prime coat and/or organic coating finish.
 - b. Indicating manufacturer's and installer's meet qualifications as specified.
- 1.5 DELIVERY, STORAGE AND HANDLING:
- A. Comply with applicable recommendations of Steel Window Institute.
 - B. Deliver steel window units and related components in manufacturer's original, unopened protective packaging labeled for identification with

manufacturer's name and brand and contents. Use padded blankets or other approved protective wrapping for glass, decorative metal work, and other exposed elements.

1. Do not deliver steel window units until work is ready for their installation.
2. Inspect components for damage upon delivery. Do not install steel window units with dimples or dents. Remove and replace damaged components at no additional cost.

C. Storage: Store steel window units and related components, in positions necessary to prevent twisting, in weathertight and dry storage facility in their original shipping containers with protective wrapping or packaging securely in place, in accordance with manufacturers written instructions.

D. Protect finish from damage from handling, weather and construction operations before, during and after installation.

1.6 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American National Standards Institute (ANSI):

Z97.1-04.....Glazing Materials Used in Buildings, Safety
Performance Specifications and Methods of Test.

C. American Society for Testing and Materials (ASTM):

A123-02.....Zinc (Hot-Dip Galvanized) Coatings on Iron and
Steel Products.

B633-07.....Electrodeposited Coatings of Zinc on Iron and
Steel

C509-06.....Elastomeric Cellular Preformed Gasket and
Sealing Material.

D2287-96(2001).....Non-rigid Vinyl Chloride Polymer and Copolymer
Molding and Extrusion Compounds

E283-04.....Test Method for Determining Rate of Air Leakage
Through Exterior Windows, Curtain Walls and
Doors Under Specified Pressure Differences
Across Specimen.

E331-00.....Test Method for Water Penetration of Exterior
Windows, Curtain Walls, and Doors by Uniform
Static Air Pressure Difference.

D. National Fire Protection Association:

NFPA 80-06.....Standard for Fire Doors and Windows.

E. Steel Structures Painting Council (SSPC):

SSPC-SP1.....Solvent Cleaning.

SSPC-SP8.....Pickling.

1.7 WARRANTY:

Warranty: Submit written warranty, in accordance with General Condition requirements except that warranty period shall be extended to include five (5) years.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Materials:

1. Frame: Formed from 2.3 mm (12 gauge) galvanized sheet steel.
2. Heavy Intermediate Ventilators: Manufactured from solid hot rolled steel shapes.
 - a. Sections made from new billet steel with flanges rolled integral at mill.
 - b. Glazing rebate surfaces must be perpendicular to web or stem of section. Applied glazing rebate extensions and tapered rebate surfaces are not acceptable.
3. Hardware shall be as follows:
 - a. Fastener: Standard bronze sweep lock.
 - b. Pulls: Standard bronze latch handle.
 - c. Balance Arm: Spiral and extension spring sash balance.
4. Paint Finishes:
 - a. Prime Coat: After fabrication, steel windows, fins, mullions, cover plates and associated parts shall be cleaned, properly treated, prime painted with manufacturer's standard prime paint.
 - b. Factory Finish: After fabrication, for type of factory finish selected, steel windows and associated components shall be cleaned, and given following treatments:
 - 1) Pretreatment: Zinc phosphate treated.
 - 2) Primer: Manufacturer's special epoxy primer and oven cured.
 - 3) Finish Coat: Manufacturer's standard color coat finish and oven cured.
 - 4) Color: Refer to Section 09 06 00, SCHEDULE FOR FINISHES.

- a) Color of finish coat is specified in finish schedule in drawings.
- b) Touch-up abraded surfaces with enamel as specified for factory finish coat, except that it shall be Class A (Air-Drying), same as original.
- c. Zinc Coated Optional Finish: All steel except screens, shall be cleaned and:
 - 1) Hot dip galvanized (ASTM A123) and/or Electrodeposited (ASTM B633) or equivalent standards.
 - 2) Zinc coated, phosphate treated and prime painted.
 - 3) Zinc coated, phosphate treated, prime painted and factory finished in color as selected, from manufacturer's standard colors.
 - 4) Use galvanize repair compound where galvanized surfaces need field or shop repair. Apply compound in accordance with manufacturer's printed directions.
- 5. Glass and Glazing: As specified in Section 08 80 00, GLAZING.
 - a. Windows shall be factory glazed prior to delivery to project site.
 - b. Do not provide weep holes through glazed areas.
- 6. Accessories:
 - a. Fit and install each screen so as to cover windows individually and be free from interference with window hardware without sacrificing protection against insects.
 - b. Anchor clips and mullions necessary for installation of glazed steel partitions required for attaching such items to window shall be provided by window manufacturer.
 - c. Screws, shields, plugs or other fastenings into building construction shall be in accordance with manufacturer's recommendations.

2.2 FABRICATION:

- A. General: Fabricate steel windows in accordance with approved shop drawings. Form sections in one piece, straight, true and smooth. Prior to fabrication, all hot rolled steel sections shall be cleaned by shot blasting.
- 1. Attachment of manufacturer's metal nameplates, shall not be permitted on any window surface.

- B. Frame: Members shall be modified channel shapes. Corners of frame and ventilators shall be mitered or coped then solidly welded. Head and jamb members shall have integral screen-stops. Integrally roll continuous flange at jambs and heads to form a caulking stop between facing and backing masonry. Exposed and contact surfaces shall be finished smooth, flush, with adjacent surfaces.
- C. Sills: Sills shall have stepped rebates to receive lower sash bottom rail, which shall be kept clear of sill wash. Sills shall not be perforated at any point in their full length. Weld strap anchors to underside of sill, or screw to tapped lugs welded thereto.
- D. Muntins: Steel tee muntin sections shall be tenoned and welded to perimeter frame. Muntin intersections shall be slotted and cross notched.
- E. Glazing: Design windows for interior glazing. Provide continuous removable snap-in metal glazing beads to suit specified glazing.
- F. Mullions: Provide manufacturer's standard or a structural shape mullion at multiple unit openings. Make mullions full height of opening and embed them to minimum depth of 125 mm (5 inches) into sill, or securely anchor at head and sill with zinc-coated sheet steel extensions, standard bent-clips or offset shapes of 1.7 mm (14 gauge) zinc-coated steel.
- G. If glazed partitions and interior metal window trim are installed as complete units, mullions may be anchored at head by means of 5 mm (3/16 inch) steel plate clip bolted to mullion and welded to lintel, and supported at sill with 2.3 mm (12 gauge) zinc-coated steel bent clips welded to mullion.
- H. Closures: Miter or cope closure corners and fit with tightly closed joints. Secure closures to window frames with non-corrosive machine screws or expansion rivets, and to masonry with fasteners specified.
- I. Reinforcing: Reinforce window frames for attachment of screens, screen hardware or travel-limit lug. Full or limited length reinforcing plates shall be welded to back of frames, and shall be 3 mm (1/8 inch) thick and of sufficient width to securely hold fasteners.
- J. Welding: Dress all exposed welds and joints, flush and smooth.
- K. Fasteners for Anchoring: Where type, size or spacing of fasteners for securing windows and accessories to building construction is not shown or specified, use expansion or toggle bolts or screws, recommended by manufacturer for construction material adjacent to window units. Bolts

or screws: Minimum 6 mm (1/4 inch) diameter and spaced not over 600 mm (24 inches) on centers.

1. Expansion shield and bolt assemblies shall provide holding power beyond tensile and shearing strength of bolt.

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Window openings shall conform to details, dimensions and tolerances shown on window manufacturers approved shop drawings.
- B. Conditions which may adversely affect window installation shall be brought to Contractors attention, for repair, prior to commencement of window installation. Do not proceed with window installation until unsatisfactory conditions have been corrected.
- C. Washdown of adjacent masonry shall be completed prior to erection of windows to prevent damage to window finish by cleaning materials.

3.2 INSTALLATION

A. General:

1. Windows specified under this section shall be installed by experienced personnel as approved by window manufacturer.
- B. Install windows 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 a minimum of three adjustable, asphalt coated or galvanized steel anchors with approved fasteners in accordance with manufacturer's recommendations.

C. Protect window equipment during construction.

- D. Upon complete installation of all windows and accessories, and before acceptance of work, adjust all movable sash and operating mechanism for free and easy operation, and defects of any nature.

- E. Furnish certificate, signed by both contractor and window manufacturer, stating that installation of windows was done by installers approved by manufacturer of windows.

3.3 PROTECTION:

- A. Protect windows from damage until final inspection and acceptance.

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