

DIVISION 8
DOORS AND WINDOWS

BUILDING WORK

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DOORS AND WINDOWS

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SECTION 08110
STEEL DOORS**PART 1 GENERAL****1.01 Work Included**

- A. Standard and fire rated type pressed steel hollow metal doors and panels and frames, with flush faces.
- B. Standard louvered steel doors and screens.
- C. Hardware for Class "A" labeled doors and panels.
- D. Install hardware and louvers.
- E. Paint.
- F. Glazing: glass should be 6mm thick clear glass for medium and heavy duty grades, for fire-resistant grades the glass should be 6mm thick Georgian wired clear glass.

1.02 Related Work

- A. Section 08111: Standard Steel Frames.
- B. Section 08700: Hardware.
- C. Section 08800: Glazing.

1.03 Reference Standards

- A. *SDI-100*: Recommended Specifications-Standard Steel Doors and Frames of Steel Door Institute.
- B. *Underwriters' Laboratories Inc.*: (UL) and Factory Manual (FM), as applicable to fire rated hollow metal doors.
- C. ASTM A525: Steel Sheet, Zinc Coated (Galvanized) by the Hot Dip Process, General Requirements.
- D. ASTM A591: Steel Sheet, Cold-Rolled, Electrolytic Zinc Coated.
- E. ASTM A366: Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.

1.04 Shop Drawings And Product Data

- A. Submit shop drawings and product data in accordance with Section 01340.
- B. Indicate general construction, configurations, jointing methods, reinforcements, and locations of cut-outs for louvers.

PART 2 PRODUCTS**2.01 Acceptable Manufacturers**

- A. The Contractor shall submit to the Engineer the names of three manufacturers and their products which will be acceptable under this Section. Approval of the manufacturer or product must be obtained before proceeding with associated work.
- B. Substitutions: Items of same function and performance are acceptable in conformance with Section 01630.

2.02 Hollow Metal Doors [And Panels]

- A. Materials and Fabrication: SDI-100 except as amended in this Section.
- B. Door Frame: 15 gauge cold rolled steel filled with concrete.
- C. Door Leaf: 44x100mm painted steel, tube as detailed, with 16 gauge steel sheet, galvanized Z profiled stiffener every 20cm and mineral fiber
- D. Louvers: Stationary and adjustable as required, and as shown on the approved Shop Drawings, 2mm steel louvers, 2.50mm U steel channel welded to 5cm steel tube and 45 x 150mm painted steel tube door leaf frame.

2.03 Hardware

- A. For class "A" labeled doors.
- B. Install butts on class "A" labeled doors prior to delivery install in accordance with UL requirements.

2.04 Fabrication

- A. Mechanically interlock longitudinal seams of honeycomb core type doors and panels with mineral fiber insulations. Leave seams invisible, or weld, fill and grind smooth.
- B. Reinforce and prepare doors and panels to receive hardware. Refer to Section 08700 for hardware requirements and schedules.
- C. Fill surface depressions with metallic paste filler and grind to smooth uniform finish.

2.04 Fabrication (Cont'd)

- D. Touch up areas where coating has been removed due to sanding or handling.
- E. Chemically treat surfaces and apply one coat of primer.
- F. Paint.

PART 3 EXECUTION

3.01 Installation

- A. Install doors in accordance with SDI-100 except as amended in this Section.
- B. Install hollow metal doors plumb and square, and with maximum diagonal distortion of 2 mm. install hardware in accordance with requirements of Section 08700.
- C. Installation of glass and glazing in door.

END OF SECTION

SECTION 08111
STANDARD STEEL FRAMES**PART 1 GENERAL****1.01 Work Included**

- A. Standard and fire rated pressed steel hollow metal door frames.

1.02 Related Work

- A. Section 08110: Standard Steel Doors
- B. Section 08210: Wood Doors
- C. Section 08700: Hardware
- D. Section 08800: Glazing

1.03 Reference Standards

- A. *SDI-100*: Recommended Specifications-Standard Steel Doors and Frames of Steel Door Institute.
- B. Underwriters' Laboratories Inc. (UL), and Factory Mutual (FM), or acceptable by the Fire Authority as applicable to fire rated hollow metal door frames.
- C. ASTM A591: Steel Sheet, Cold-Rolled, Electrolyte Zinc Coated.
- D. ASTM A366: Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.

1.04 Shop Drawings and Product Data

- A. Submit shop drawings and product data in accordance with Section 01340.
- B. Indicate general construction, configurations, jointing methods, reinforcements, anchorage methods, hardware locations and installation details.

PART 2 PRODUCTS**2.01 Acceptable Manufacturers**

- A. The Contractor shall submit to the Engineer the names of three manufacturers and their products which will be acceptable under this Section. Approval of the manufacturer or product must be obtained before proceeding with associated work.
- B. Substitutions: Items of same function and performance are acceptable in conformance with Section 01630.

2.02 Hollow Metal Frames

- A. Materials and Fabrication: SDI-100 except as amended in this Section.
- B. Types: Knockdown Frames.
- C. Mortar Guard Boxes: minimum 0.76 mm thick welded in place.
- D. Door Bumpers: manufacturer's standard resilient type; removable for replacement.

2.03 Fire Rated Frames

- A. Fabricate fire rated hollow metal frames of materials in accordance with requirements of Underwriters' Laboratories Inc. (UL) or acceptable by the Fire Authority. Place UL labels where visible when frames are installed in position.

2.04 Fabrication

- A. Accurately form interlocking joints of knocked down frames to maintain alignment of parts when field assembled.
- B. Accurately cope and securely weld butt joints of mullions and transoms. Grind welded joints to smooth uniform finish.
- C. Reinforce head sections where mullions occur.
- D. Reinforce frames wider than 1200 mm with 2.5 mm thick formed steel channels weld in place, flush with top of frames.
- E. Reinforce and prepare frames to receive hardware. Refer to Section 08700 for hardware requirements.
- F. Place minimum of 3 single bumpers on single door frames. Space equally along strike jambs.

2.04 Fabrication (cont'd)

- G. Place minimum of 2 single bumpers on double door frames. Place on frame heads.
- H. Provide jamb anchors: SDI-100. Weld floor jamb anchors in place.
- I. Fill surface depressions of hollow metal frames with metallic paste filler and grind to smooth finish.
- J. Touch up areas where coating has been removed due to sanding or handling.
- K. Chemically treat surfaces and apply one coat of primer, and two powder coated paint.

PART 3 EXECUTION**3.01 Installation**

- A. Install door frames in accordance with SDI-100 except as amended in this Section.
- B. Install hollow metal frames plumb and square, in correct locations indicated on drawings and with a maximum diagonal distortion of 2 mm. Ensure frames are securely and rigidly anchored to adjacent construction.
- C. After installation, touch-up scratched or damaged surfaces. Use type of primer identical to that used for shop coat.

END OF SECTION

SECTION 08210
WOOD DOORS AND FRAMES**PART 1 GENERAL****1.01 Work Included**

- A. Standard and fire rated type wood doors, with flush faces as indicated on the relevant detailed drawings.
- B. Frames and architraves - in solid Oak and hard wood, type as indicated on the drawings.
- C. Soft wood sub-frames.
- D. Install door hardware.
- E. Glazing (glass should be 6mm thick clear glass for medium and heavy duty grades for fire resisting grades the glass should be 6mm Georgian wired clear glass).

1.02 Related Work

- A. Section 06200 : Finish Carpentry.
- B. Section 08700 : Hardware.

1.03 Reference Standards

- A. AWI Quality Standards of Architectural Woodwork Institute.

1.04 Shop Drawings And Product Data

- A. Submit shop drawings and product data in accordance with Section 01340.
- B. Indicate general construction, jointing methods and hardware locations.

1.05 Guarantee/Warranty

- A. Provide written guarantee in accordance with "Conditions of Contract".
- B. Guarantee: Provide for replacing (including cost of rechanging and refinishing), at no cost to Owner, wood doors, frames and architraves exhibiting defects in materials or workmanship including warp and delamination within minimum period of 5 years from date of substantial completion of the work.
- C. All guarantees/warranties to be issued by the Supplier, Manufacturers and Sub-Contractors shall be countersigned by the Main Contractor and both of them will be liable for repair/replace the items/works, etc., during the warrantee/guarantee period.

PART 2 PRODUCTS**2.01 Acceptable Manufacturers**

- A. The Contractor shall submit to the Engineer the names of three manufacturers and their products which will be acceptable under this Section. Approval of the manufacturer or product must be obtained before proceeding with associated work.

2.02 Door Type

- A. Flush faced or decorated, veneered Oak wood doors and finishes as per doors schedule of finishings, details, and wood work general notes.
- B. Flush faced softwood doors and steel frames and finishes as per doors schedule of finishing, details and wood work general notes.

2.03 Doors

- A. Flush and decorated doors: 45 mm thick
- B. Frames: 40 mm Oak wood hardwood, clear lacquer finish to the Engineer 's approval.
- C. Subframe: 10cm x23mm soft wood frame.
- D. Architraves: 15mm minimum thickness Oak wood or hardwood, finish to the Engineer 's approval.

2.04 Fabrication

- A. Fabricate doors, frames and architraves in accordance with requirements of AWI Quality Standards.
- B. Fabricate fire rated doors in accordance with requirements of Underwriters' Laboratories (UL).
- C. Provide doors with minimum 25 mm thick edge strips, of wood species to match face veneers.
- D. Make cut-outs and provide stops for glass.
- E. Bevel strike edge of single acting doors 3 mm in 5 mm.
- F. Prepare doors to receive hardware. Refer to Section 08700 for hardware requirements.

PART 3 EXECUTION**3.01 Installation**

- A. Install wood doors, frames and architraves plumb and square, and with maximum diagonal distortion of 1.6 mm install hardware in accordance with requirements of Section 08700.

END OF SECTION

**SECTION 08305
ACCESS DOORS****PART 1 GENERAL****1.1 Section Includes**

- A. Fire rated and non-rated access door and frame units.
- B. Wall and ceiling locations.

1.2 Related Sections

- A. Section 03300: Cast-in-place concrete
- B. Section 05500: Miscellaneous Metals.
- C. Section 09310: Ceramic Tiles.
- D. Section 09900: Painting.
- E. Section 15910: Ductwork Accessories: Access doors in ductwork.
- F. Electrical components requiring access.

1.2 References

- A. UL - Fire Resistance Directory.

1.3 Submittals For Review

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work in accordance with section 01340: shop drawings product data and samples.
- C. Shop Drawings: Indicate exact position of all access door units.
- D. Samples: Submit two samples of access units, (600 x 600 mm) in size illustrating frame configuration, anchors and all accessories.

1.4 Submittals For Information

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Manufacturer's Installation Instructions: Indicate installation requirements, rough-in dimensions.

1.5 Submittals At Project Close-out

- A. Section 01700 - Contract Close-out: 01730 - Operation and Maintenance Data: Procedures for submittals.
- B. Record actual locations of all access units.

1.6 Regulatory Requirements

- A. Conform to UL REQUIREMENTS code for fire rated access doors.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of fire rated doors.

1.7 Project Conditions

- A. Section 01039 - Coordination and Meetings.
- B. Coordinate the work with other work requiring access doors.

PART 2 PRODUCTS**2.1 Manufacturers**

- A. the contractor shall submit to Engineer review and approval the names of three manufacturers and their products which will be acceptable under this section. The approval of the manufacturer and products must be obtained before proceeding with associated work.
- B. Section 01630 - substitutions of same functions are acceptable in accordance with this section

2.2 Fabrication - Wall And Ceiling Units

- A. Door Frame: 50 x 20 mm hardwood frames fixed to wall by steel lugs.
- B. Door Leaf: Hardwood door leaf frames, 12mm thick block board, solid foam insulation 2 hours fire rated, faced with 5 mm thick plywood oil painted inner side and faced with ceramic tiles on adhesive outer side.
- D. Hardware:
 - 1. Hinge: 175 degree stainless steel piano hinge with removable pin concealed constant force closure spring type.
 - 2. Lock: Screw driver slot for quarter turn cam lock Cylinder lock with touch latch, chrome finish two keys for each unit.

2.3 Finishes

- A. Finish: finished with paint similar to adjacent walls.

PART 3 EXECUTION**3.1 Examination**

- A. Section 01039 - Coordination and Meetings: Verification of existing conditions before starting work.
- B. Verify that rough openings for door and frame are correctly sized and located.

3.2 Installation

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in opening. Secure rigidly in place.
- C. Position unit to provide convenient access to concealed work requiring access.

END OF SECTION

SECTION 08520
ALUMINUM WINDOWS, DOORS, SCREENS & CURTAIN WALLS

PART 1 GENERAL**1.01 Work Included**

- A. Thermal braked extruded aluminum windows, doors, screens & curtain walls complete with glass and glazing hardware, and fly-screens of aluminum woven mesh in aluminum frame of same material and color as windows.
- B. Install perimeter sealants.
- C. Install hardware as indicated.
- D. All Aluminum windows, doors, screens & curtain walls shall be powder coated, of colour as selected by the Engineer.
 - 1. Furnish and install all items required to complete the work in accordance with the intent of the drawings and specifications.
 - 2. Furnish all bolts, anchors and inserts required for this work for building into or fastening to the adjacent construction, complete with necessary setting templates. Supervise the installation or verify the correct location of items after installation. Deliver items to the appropriate contractor in sufficient time to install properly.
 - 3. Where the work of this section is intended to closely to work of other sections, take field measurements prior to the preparation of shop drawings and fabrication. Allow for trimming fitting.

1.02 Related Work

- A. Section 07900: Joint Sealants.
- B. Section 08800: Glazing.
- C. Section 08700: Supply of finish hardware, other than specified in this Section.

1.03 Reference Standards

- A. ANSIO A134.1 Specifications for Aluminum Windows.
- B. ASTM A36 Structural Steel.
- C. ASTM B209 Aluminum-Alloy Sheet and Plate.
- D. ASTM B221 Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes.

1.04 Shop Drawings and Product Data

- A. Submit shop drawings and product data in accordance with Section 01340.
- B. Indicate pertinent dimensioning, general construction, component connections and locations, anchorage methods and locations, hardware locations, installation details.

1.05 Quality Assurance

- A. The work of this Section shall be carried out by an approved Contractor having specialized in this work as its primary business for at least 10 years, and having performed satisfactorily work of this type and magnitude.
- B. The Engineer reserves the right to reject materials and/or workmanship not conforming to the specifications at any time before final acceptance.
The Engineer's acceptance of materials or workmanship shall not prevent its subsequent rejection if defects are discovered later.
The Contractor shall remove installed materials which are rejected by the Engineer and replace them at no additional cost to the Employer.

1.06 Delivery of Materials

- A. Deliver windows in Manufacturer's packaging complete with installation instructions.

1.07 Samples

- A. Submit in accordance with Section 01340, full size sample of window corner construction, including opening section, indicating profile, size and jointing method. Also submit sample of each type of operable hardware, indicated style and finish.
- B. Submit color samples for color selection, powder coated finish for the Engineer's approval.

1.08 Guarantee/Warranty

- A. Attention is directed to the provisions of the conditions of contract regarding guarantees/warranties..
- B. Provide written Guarantee in the name of the Employer in accordance with the Conditions of Contact, covering all materials and workmanship used in the installation of the aluminum windows, for a period of ten(10) years from the date of final acceptance of this Project.
- C. Manufacturer's shall provide their standard Guarantee for the work under this section. However, such guarantees shall be in addition to and not in lieu of all other liabilities which the Manufacturer and contractor may have by law or by other provisions of the Contract Documents.

PART 2 PRODUCTS**2.01 Acceptable Manufacturers**

- A. The Contractor shall submit to the Engineer's the names of three manufacturers and their products which will be acceptable under this Section. Approval of the manufacturer or product must be obtained before proceeding with associated work.
- B. Substitutions: Items of the same function and performance are acceptable in conformance with Section 01630.

2.02 Windows and Doors

- A. Type: Thermal Braked extruded aluminum; ASTM B221 alloy, with fixed lights and weather-stripping.
- B. Finish: Factory apply powder coating to exposed surfaces of colour as selected by the Engineer.

2.03 Components and Materials

- A. Frames Sections will be designed to suit the installation with due allowance for wind loads, heights and location, of minimum 2.50mm thick extruded aluminum.
- B. Operable Frames Sized and profiled to suit frames, complete with Manufacturer's standard type glass stops of size and profile to suit.
- C. Glass Stops (fixed lights) Manufacturer's standard screw-applied type, of size and profile to suit frames.
- D. Glass (Generally) As indicated on drawings.
- E. Glazing Materials Manufacturer's standard type, to suit locations and applications.
- F. Bituminous Paint Acid and alkali resistant type, color as approved.

2.04 Fabrication

- A. Fabricate window units in conformance with ANSI A134.1.
- B. Fabricate aluminum windows to allow for adequate clearances and shim spacing around perimeter of assemblies to enable proper installation. Allow for thermal movement within window construction.
- C. Provide expansion joints where required.
- D. Provide sufficient corrosion resistant anchorage devices to securely and rigidly fit windows in place.

2.04 Fabrication (cont'd)

- E. Accurately and rigidly fit together joints and corners. Match components carefully ensuring continuity of line and design. Ensure joints and connections are flush, hair line and weatherproof.
- F. Provide internal reinforcing, with steel members; ASTM A36 galvanized where required to maintain rigidity.
- G. Provide for moisture entering joints, and condensation occurring within frame construction to drain to exterior.
- H. Apply coat of bituminous paint on concealed aluminum surfaces in contact with cementitious or dissimilar materials.

PART 3 EXECUTION**3.01 Installation**

- A. Install aluminum windows in accordance with Manufacturer's recommendations, to achieve weather-tight installations. Ensure assemblies are plumb, level and free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- B. Install sufficient corrosion resistant anchorage devices to securely and rigidly fasten windows to building, without causing detrimental effects to shape or performance.
- C. Set window sills level and uniform. Accurately and rigidly fit together joints. Ensure joints are flush, hairline and weatherproof.
- D. Place batt insulation in shim spaces around perimeter to maintain continuity of thermal barrier.
- E. Install sealants and related backing materials around perimeter of windows in accordance with workmanship and installation requirements indicated in Section 07900.

END OF SECTION

SECTION 08700
HARDWARE**PART 1 GENERAL****1.01 Work Included**

- A. Hardware for interior and exterior doors, windows, and other items shall be first quality, imported type.

1.02 Related Work

- A. Section 06200: Finish Carpentry.
- B. Section 08110: Steel Doors.
- C. Section 08210: Wood Doors and Frames.
- D. Section 08520: Aluminum Windows, Doors screens and curtain walls.

1.03 Reference Standards

- A. ANSI A115.1 - Door and Frame Preparation for Mortise Door Locks for 45mm Doors.
- B. ANSI A115.2 - Door and Frame Preparation for Bored or Cylindrical Locks for 45mm Doors.
- C. ANSI A115.5 - Frame Preparation for 181 & 190 Series Deadlock Strikes.
- D. ANSI A115.7 - Door and Frame Preparation for Floor Closers, or Double Acting.
- E. ANSI A115.8 - Door and Frame Preparation for Floor Closer, Single or Double Acting.
- F. ANSI A156.1 - Butts and Hinges.
- G. ANSI A156.2 - Locks and Lock Trim.
- H. ANSI A156.3 - Exit Devices.
- I. ANSI A156.4 - Door Controls (Closers).

1.04 Submittal

- A. Submit 2 copies of manufacturer's product data and catalog cuts for all finish hardware items.
- B. Submit 3 copies of complete hardware schedule including Master key schedule listing all door numbers for each hardware set.
- C. Submit 2 samples of each type of hardware in accordance with Section 01300 "Submittals".
- D. Supply hardware templates to door and frame manufacturers for preparation of doors and frames for hardware.
- E. Provide the Engineer with manufacturer's parts list and maintenance instructions for each type of hardware supplied, and necessary wrenches and tools required for proper maintenance of hardware.
- F. Make submittals in accordance with Section 01300 "Submittals".
- A. Submit samples of each type of hardware required for job, in accordance with Section 01300.

1.05 Shop Drawings and Product Data

- A. Submit shop drawings and product data in accordance with Section 01300.

1.06 Hardware Schedule

- A. Upon award of the contract the successful Contractor shall submit a hardware schedule for approval by the Engineer in accordance with Section 01300. Items shall be identified by:
 - Manufacturer - Catalogue Number - Size
 - Fastening - Finish
- B. Handing of door and window opening shall be as Hardware Schedule.

1.07 Keying

- A. Door locks Master: submit schedule for the Engineer approval.
- B. In general, provide for grand master keying. Provide 3 keys for each lock, 3 master keys for each group of locks, and 3 grand master keys. Provide spare cylinders, blank keys, and spare knobs in compliance with requirements of the Contract..
- C. Supply 3 keys for each lock.

1.08 Operation and Maintenance Data

- A. Provide the Engineer with manufacturer's parts list and maintenance instructions for each type of hardware supplied and necessary wrenches and tools required for proper maintenance of hardware.

PART 2 PRODUCTS**2.01 Hardware**

- A. Provide items in accordance with hardware schedule prepared by hardware supplier, complete to function as intended.

2.02 Acceptable Manufacturers

- A. The Contractor shall submit to the Engineer the names of three manufacturers and their products which will be acceptable under this Section. Approval of the manufacturer or product must be obtained before with associated work.
- B. Substitutions: Items of same function and performance are acceptable in conformance with Section 01630.

PART 3 EXECUTION**3.01 Installation**

- A. Install hardware in accordance with manufacturer's recommendations, using proper templates.

END OF SECTION

SECTION 08800
GLAZING**PART 1 GENERAL****1.01 Work Included**

- A. Glass and glazing for windows and doors.
- B. Mirror for washrooms.

1.02 Related Work

- A. Section 08110 : Steel Doors.
- B. Section 08210 : Wood Doors.
- C. Section 08520 : Aluminum Windows and Doors.

1.03 Reference Standards

- A. FS DD-G-451C - Glass, Plate, Sheet, Figured (Flat, for Glazing, Mirrors and Other Uses).
- B. FS TT-S-230A - Sealing Compound, Synthetic Rubber Base, Single Component, Chemical Curing For Caulking, Sealing and Glazing in Building Construction.
- C. FS TT-S-001543 - Sealing Compound, Silicon Base (For Caulking and Glazing in Buildings and Other Structures).

1.04 Guarantee/Warranty

- A. Provide written guarantee in accordance with Conditions of Contract, in the name of the Owner.
- B. Provide Ten (10) years warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of the same.
- C. Provide Ten (10) year warranty to include coverage for delamination of reflective glass and replacement of the same.

PART 2 PRODUCTS**2.01 Acceptable Manufacturers**

- A. The Contractor shall submit to the Engineer the names of three manufacturers and their products which will be acceptable under this Section. Approval of the manufacturer or product must be obtained before proceeding with associated work.

2.02 Specifications

- A. *6 mm Glass*: Glazing quality; FS DD-G-457C glazing for curtain walls and windows shall be sealed double glazed units, incorporating 6mm tempered outer pane; 12mm sealed air space, and 6mm tempered glass inner pane, from an approved manufacturer. All single glazed units, other than those specified to be glazed with tempered glass, shall be glazed with 6mm clear float glass from an approved American and Belgian manufacturer.
- B. Glass entrances and screens shall be 12mm thick fully tempered, color to the Engineer approval.
- C. *Mirrors*: FF DD-G-451c; polished plate or float glass recommended for high humidity use sheet glass with silvered backs; arrised edges; minimum 6 mm thick.
- D. *Glass Walls*: 12mm toughened tempered glass with all exposed edges smoothed and with suitable counter sunk holes on the play side. Exposed corners must be radiused. The lower 600mm of panels must have vertical 3mm wide white lines, with 25mm of clear space applied to the surface. Where indicated centrally located all-glass doors shall be provided, including a pull handle on both sides.
- E. *Glass for wood and steel doors*: 6mm thick laminated safety glass for medium and heavy-duty grades, and 6mm thick Georgian wired clear glass for fire - resistant doors.
- F. *Patch fittings for security glass* should be stainless steel as manufactured by GEZE or approved equal.
- G. *Mechanical Connections* must be provided, designed to integrate the wall assembly. These must be manufactured from materials wholly compatible with glass and able to cope with and distribute the constant stress applied.
- H. *Tempered (Toughened) glass*- Tempered glass shall be produced by subjecting ordinary annealed glass to heating followed by rapid surface cooling, which produces high compression in the surface of the glass. Tempered glass shall be up to five times as strong as ordinary glass in resisting impact and when breaks, the fragments into small and comparatively harmless pieces. Generally, tempered glass offers greatly increased resistance to sudden temperature changes of up to 250°C and stress characteristics of tempered glass are unchanged for continuing service up to 300°C and are unaffected at sub-zero temperatures.

2.02 Specifications (cont'd)

- I. Tolerance on glass thickness -The tolerance on thickness for various type of glass shall be as shown on Table-I below;

Type of Nominal glass Thickness	Float glass	Patterned glass	Wired glass	Tempered glass
2	-	+ 0.3	-	-
3	+ 0.3	-	-	-
4	+ 0.3	+ 0.4	-	+ 0.3
5	+ 0.3	-	-	+ 0.3
6	+ 0.3	+ 0.4	-	+ 0.3
6.5	+ 0.3	-	+ 0.6	-
8	+ 0.6	-	-	+ 0.6
10	+ 0.6	-	+ 0.6	+ 0.6
12	+ 0.8	-	-	+ 0.8
15	+ 0.8	-	-	+ 0.8
19	+ 1.2	-	+ 0.6	+ 1.2

* Note : Thickness patterned and wired glass shall be between top of patterned convex and other parallel surface.

2.03 Glazing Compounds

- A. Glazing Compound: Modified oil type; FS TT-G-410E; color to match aluminum framing sections.
- B. Silicon compound for all joints of glass walls. FEB SEAL SILLICON HM or approved equal.
- C. Sealant
1. General -The sealant shall generally be used copping and bedding application and type of sealant to be incorporated to the work shall be shown on the Drawings.
 2. One-part sealant, curing type: One-part sealant shall be of polysulphide, silicone or urethane base and undergo at normal temperature, chemical reaction to form a firm resilient seal.
They shall be capable to tolerate greater movement over climatic temperature variations.
 3. One-part sealant, solvent release type-one-part sealant, solvent release type should be of butyl or acrylic bases and essentially no-curing in the sense that no extensive chemical change takes place.
 4. Two-part sealants, curing type: Two-part sealants shall be of polysulphide or polyurethane base and supplied as two component materials which, when mixed, react to form a rubbery materials.
The mix proportion of components and mixing procedure shall be in strictly accordance with instruction of the manufacturer.

2.04 Glazing Accessories

- A. Setting Blocks: Neoprene; 80-90 Shore A durometer hardness; 9.5 mm long x width of glazing rabbet space minus 1.5mm x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene; 50 to 60 Shore A durometer hardness; 76 mm long x one half the height of the glazing stop x thickness to suit application.
- C. Glazing Splines: Manufacturer's standard dry glazing splines to suit aluminum extrusions.
- D. Glazing Tape: Preformed butyl type; NAMM #SS-1B-68, with integral spacing devices; Manufacturer's Standard size and color; 10-15 shore A durometer hardness.

PART 3 EXECUTION**3.01 Exterior Dry Method (Preformed Glazing Channel)**

- A. Clean contact surfaces with solvent and wipe dry.
- B. Cut glazing spline to proper length and install on glass pane. Weld joints by butting channel and dabbing with sealant.
- C. Place setting blocks at 1/4 points with edge block no more than 150mm from corners.
- D. Rest glass on setting blocks, and push against stop with sufficient pressure to ensure full contact and adhesion at perimeter.
- E. Install removable stops, avoid displacement of glazing Spline, exert pressure for full continuous contact.

3.02 Interior Dry Method (Tape and Tape)

- A. Cut glazing tape to length and install against permanent stop, projecting 1.6 mm above sight line.
- B. Place setting blocks at 1/4 points with edge block no more than 150mm from corners.
- C. Rest glass on setting blocks and push against tape for full contact at perimeter of pane or unit.
- D. Place glazing tape on free perimeter of glass in same manner described above.
- E. Install removable stop, avoid displacement of tape, exert pressure on tape for full continuous contact.
- F. Knife trim excess or protruding tape.

3.02 Interior Dry Method (Tape and Tape) (cont'd)

- G. Glass walls are a specialist item. Installation must be carried out by trained experts in accordance with approved procedures. The walls must be supplied and installed under one contract accompanied by a ten year warranty for both material and installation.

3.03 Cleaning

- A. After installation mark glass with X by using tape or removable paste.
- B. Immediately remove droppings from finished surfaces. Remove labels after work is completed.

END OF SECTION