Part 1 General

1.1 REFERNCES

.1 References: Applicable, latest dates, names and titles of general standards are referred to by accepted abbreviations.

.2 Correctional Service Canada (CSC) Technical Criteria, 2015.

.3 AISI Type 304 - Stainless Steel

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

.5 ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

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

.7 ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference

.8 AAMA/NWWDA-101/I.S.2-97 - Performance requirements for products made of aluminum, vinyl (PVC), ABS plastics, fiberglass and wood, aluminum-clad or vinyl-clad wood framing members.

.9 AAMA-1503.1 Test Methods for Performance of Exterior Windows, Curtain Walls, and Doors.

.10 ASTM A 627-03 Testing of security steel (tool-resisting steel - round and flat bars).

.11 ASTM F 1592-01 Testing of detention/security vision system.

.12 NFRC 100: 2001 Procedure for determining fenestration product U-factors. (Simulation only).

1.2 PERFORMANCE REQUIREMENTS

.1 Windows shall meet or exceed the following requirements:

.1 Air Infiltration Test: ASTM E 283-99; maximum air infiltration of 0.02 cfm/ft² of frame area at a static air pressure difference across the window unit of 1.57 psf (25 mph) and 0.04 cfm/ft² at a static air pressure difference of 6.27 psf (50 mph).

.2 Water Resistance Test: ASTM E 331-00; no water penetration for 15 minutes when window is subjected to a water flow rate of 5 U.S.gal/h-ft² at a static air pressure difference of 10.50 psf (65 mph).

.3 Uniform Load Structural Test: ASTM E 330-02; no permanent deformation or breakage of any component that will render the window assembly inoperable when subjected to positive and negative static air pressure difference of 105 psf (204 mph). Tested on a maximum window size of 72" x 72" glazed with 1" double sealed unit (1/4" clear tempered + air + 1/4" clear tempered).

.4 Performance Requirements: AAMA/NWWDA 101/I.S.2-97; the aluminum window shall comply with product designation; F-HC70.

.5 Thermal Requirements: NFRC 100: 2001; the thermal transmittance of the window frame (U-factor) should not be more than 0.77 btu/h-ft2-F and the thermal transmittance of the window assembly should not be more than 0.59 btu/h-ft2-F when calculated as per the simulation procedure outlined in NFRC 100: 2001 for a window of 15 19/32" x 47 5/8" glazed with 1" double sealed unit (1/4" clear tempered + air + 1/4" clear tempered).

.6 Condensation Resistance Factor Test: AAMA 1503.1-98; the condensation resistance factor (CRF) should be at least 58 for a fixed window glazed with a double sealed unit.

.7 Security Steel Performance Requirements Selection: ASTM A 627-03; the tool-resisting, steel bars for security applications shall meet Grade No. 1 Composite T.R Steel, as defined in tables X 1.1 and X 1.2 of ASTM A 627-03. Composite tool-resisting steel bar is defined as a composite assembly made of steel and tungsten carbide.

.8 Deflection & Drop Weight Test: ASTM A 627-03; test 1" dia. round, tool-resisting steel security bar by performing "Deflection Test" and "Drop Weight Test".

.9 Cutting Test: ASTM A 627-03; test 1" dia. round bars and 5/16" x 2 1/4" or 3/8" x 2 1/4" flat bars by performing a "Cutting Test". The minimum number of rod saws to be used to sever the bars shall be Grade No. 1; 1" dia. Round composite T.R. Steel: 144 Rod Saws Combined with 3/8" x 2 1/4" composite T.R. Steel flat bar: 72 Rod Saws.

.10 Vision System Impact Test; ASTM F 1592-01; submit the window assembly to the impact test sequence (4 only), for Grade No. 1, in Table 1 of ASTM F 1592-01. 600 blows of 200 ft-lbf impact energy each must be delivered at least in the following two locations: Frame corner and center of one muntin; total of 1,200 blows minimum.

.11 Standard of Quality: Products shall meet the standard of quality as defined in Part 2 – 2.01.

.2 Manufacturer: All windows and other related components shall be the products of a well known manufacturer regularly engaged in the manufacture of high quality detention/security windows, security screens and composite tool-resistant steels for security application, for at least 10 years.

.3 Factory Test of Mock-Up: A mock-up of a window could be made in the window fabricator's factory and tested in the presence of client's representatives to allow inspection. The mock-up is tested for weather and security performances as specified. The unit shall be tested and all corrections shall be made until the unit passes the tests.

.4 Site Mock-Up: Prior to general window installation, erect a full size mock-up at the project site of a typical condition as selected by the Departmental Representative. Each mock-up is to be constructed with adjacent materials such as masonry, metal siding, etc., showing relationship to windows. Locate mock-ups on site where directed by Departmental Representative. Approved mock-up to remain as part of finished work.

.5 Conform with CSC Technical Criteria, 2015.

1.3 SUBMITTALS

.1 Product Data: Submit manufacturer's specifications, recommendations and standard details for each type of window required. Include information on fabrication, finishing, hardware and accessories.

.2 Shop Drawings: Submit drawings including window elevations and full size details of every typical member. Show anchors, hardware, operators and accessories which are not fully detailed in manufacturer's product data. Include glazing details.

.3 Samples: Submit a typical, complete window sample of specified finish. Submit additional samples which will show fabrication techniques and workmanship, and design of hardware and accessories when requested.

.4 Certificates: Where windows and security bars have been tested in accordance with specified tests and comply with requirements, provide certification of compliance with such tests; otherwise, perform required tests through a recognized testing agency and provide certified test results.

.5 Laboratory Test Reports and Certificates: Shall be submitted by the manufacturer to the architect, for review and approval, 2 weeks prior to bid closing. An omission of an item or items does not relieve the manufacturer from this responsibility and for compliance with the contract documents of which this is a part.

1.4 QUALITY ASSURANCE

.1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.2 Mock-ups:

- .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
- .2 Construct mock-ups to demonstrate window installation at various degrees of completion:
  - .1 Mock-up 1: Rough Opening Preparation.
  - .2 Mock-up 2: Structural, Vapour Barrier and Flashing tie-ins, including welds on two sides.
  - .3 Mock-up 3: Finished Window installation, including masonry work.
- .3 If approved by Departmental Representative, printed photographic evidence will be accepted in lieu of Mock-up 1.
- .4 Mock-up will be used to judge workmanship, substrate preparation, operation of equipment and material application.
- .5 When accepted, mock-up will demonstrate minimum standard of quality required for this work, and will remain as part of the finished project.

.3 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 SITE CONDITIONS

.1 Environmental Requirements:

- .1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.
- .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.2 Divert metal cut-offs from landfill.

.3 Divert uninstalled materials for reuse at nearest used building materials facility or similar type facility.

.4 Divert unused caulking and sealant materials from landfill through disposal at special wastes depot.

.5 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

.6 Remove form site and dispose of packaging materials at appropriate recycling facilities.

.7 Dispose of packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

1.7 GUARANTEE

.1 In accordance with Article on "GUARANTEES" of the "General Conditions Governing All Contracts," the manufacturer hereby guarantees that all work specified in this section will be free from defects of materials and workmanship for a period of three (3) years.

.2 Furnish a guarantee in the form specified in article on "GUARANTEES" of the "GENERAL CONDITIONS GOVERNING ALL CONTRACTS".

.3 The following types of failure will be adjudged as defective work:

.1 Structural failures, including excessive deflections.

.2 Excessive leakage or air infiltration.

.3 Deterioration of metals and finishes beyond normal weathering.

Part 2 Products

2.1 STANDARD OF QUALITY

.1 The standard of quality for the products to be used on this project has been established as follows:

.1 Manufacturer: Subject to compliance with requirements, provide security detention windows as manufactured by, but not limited to, C.M. Security Group Inc., as specified, or approved equal.

.2 Request for Approved Equal: All requests for approval, as equal, of a product not listed in the bid documents must be submitted to the architect in writing 14 days prior to the published bid opening. This application for approval must be accompanied by supporting documents for each of the references listed under Section 1.02 Quality Assurance and Performance Requirements and Section 1.03 Submittals from an accredited third party testing facility.

.3 Window Series/Types: Provide C.M. Security Group Inc. *Series 3000 -150* Fixed windows, thermally broken aluminum and stainless steel interior security element.

.4 Interior Stainless Steel Glass Stops: Provide removable "L" profile glass stops secured to the stainless steel security element by security fasteners as shown and specified.

.5 Exterior Aluminum Glass Stops: Extruded aluminum snap-in to the main frame. Secured with 2 security screws per vertical glass stop.

.6 Assembly: The thermally broken aluminum window and the stainless steel security element shall be attached together using stainless steel rivets, spaced at 6" c/c. Sealant must be applied between aluminum and stainless steel mating surfaces. Refer to performance requirements for full assembly performance.

.7 Muntins: The horizontal or vertical muntins shall never be spaced more than 6 1/8" c/c.

2.2 MATERIALS

.1 Stainless Steel: Type 304 14 GA standard 2B (bright cold rolled) finish, shall be specially formed to the profiles and sizes required for head, sill, jambs, glass stops and trims.

.2 Aluminum Extrusions: Horizontal or vertical muntins, main frame, glass stops and trims shall be specially designed aluminum extrusion 6063-T5, no less than 22,000 psi ultimate tensile strength, with a nominal thickness of 3.175mm (0.125") for muntin and 2.362 (0.093") for main frame.

.3 Tool-Resisting Steel Bars: Shall conform to the following grade by ASTM A 627-03 standard: Grade No. 1, Composite T.R. Steel, 25.4mm (1") dia. round & 9.52mm (3/8") x 57.15mm (2 1/4") flat.

.4 Fasteners: Non-magnetic stainless steel, or other materials warranted by manufacturer to be non-corrosive and compatible with window members, trims, hardware and anchors.

.1 Provide stainless steel, torx tamper resistant 6.35mm (1/4") -20 screws spaced at 6" c/c or stainless steel "pop" rivets for exposed fasteners.

.5 Anchors, Clips and Window Accessories: Depending on design strength requirements, fabricate units of non-magnetic stainless steel or rust inhibitive primer painted mild steel.

.6 Sealant: Provide type recommended by window manufacturer for joint size and movement, to remain permanently elastic, non-shrinking and non-migrating. Comply with Section 079200 for installation of sealant.

.7 Thermal Break: Main frame aluminum extrusion shall be two-part designed with special channel shape and shall be joined by "poured in place" polyurethane resin.

.8 Glazing Strip Materials: At manufacturers' discretion provide:

.1 Medium to firm type sponge neoprene glazing tape, ASTM D 1056-85 designation: 2A3 to 2A5

.2 Extruded EPDM, bulb type glazing gasket

.3 Pre-shimmed butyl tape.

2.3 WINDOW TYPES

.1 Fixed, Thermally Broken Windows: Units composed of a stainless steel interior security element attached to a thermally broken aluminum window frame. The security barrier includes a security grid formed of tool-resisting round and flat bars, concealed within the stainless steel frame and horizontal or vertical muntins. Muntins shall be spaced at a maximum of 155.575mm (6 1/8") c/c 3.175. Mechanical louvre on top of window as per Drawings.

2.4 GLAZING

.1 Refer to Section 08 80 50 - Glazing

2.5 FABRICATION AND ACCESSORIES

.1 General: Provide manufacturer's standard fabrication and accessories which comply with indicated standards, except to extent more stringent requirements are indicated. Include all items for assembly and anchorage of window units, and prepare for glazing. Provide perimeter frames, sill, jamb and head as shown and specified.

.2 Welding: All welding shall be done by qualified welders, using latest welding techniques and designs compatible with requirements for the window performance as specified.

.3 Window Design Sizes and Profiles: Window design, required sizes for window units and profile requirements are indicated on drawings. Details on drawings are based upon standard details. Similar details by other pre-qualified manufacturers will be acceptable, provided they comply with window design, size, profile and performance requirements as specified.

.4 Coordination of Fabrication: Where possible, check actual window openings by accurate field measurement before fabrication. Where necessary, proceed with fabrication without field measurements, based on approved shop drawings and coordinate installation tolerances to ensure proper fit of windows.

.5 Drainage: Provide means of drainage for water and condensation which may accumulate in members of window units.

.6 Mullions: Provide mullions as shown, matching window units, and complete with anchors for support and installation. Allow for erection tolerances and provide for movements of window units due to thermal expansion and building deflections.

2.6 WINDOW FINISH

.1 Stainless steel security elements; provide standard No. 2B stainless steel finish (bright cold rolled) for the frame, glass stops and interior trims and clear anodized finish .01778mm (0.0007" minimum thickness) for the aluminum muntins.

.2 Thermally broken aluminum weather barrier; provide polyester powder coated for the frame, glass stops and exterior trims. Colour to be selected by Departmental Representative from manufacturer’s standard color selection.

.3 Provide finish to match approved sample.

Part 3 Execution

3.1 INSTALLATION

.1 Comply with manufacturer's specifications and recommendations for installation of window units, hardware, operators, and other components of the work.

.2 Set units plumb, level and true to line, without warp or rack of frames or sash. Anchor securely in place by methods shown on shop drawings. Separate zinc-coated steel and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials, by bituminous or paint coating or plastic materials.

.3 Set sill members (when required) and other members with joint fillers or gaskets, to provide weather-tight construction. Refer to "Joint Sealer" section of Division 7 for sealants, fillers, and gaskets to be installed concurrently with window units. Coordinate installation with wall flashings and other components of the work.

.4 Clean surfaces promptly after installation of windows, exercising care to avoid finish damage. Remove excess sealant, dirt and other substances.

.5 After erection of the windows, clean and touch-up any abraded surfaces, as approved by the window manufacturer, to match factory-applied finish.

.6 Installer shall advise contractor of protection and other precautions required through remainder of construction period, to ensure that window units will be without damage or deterioration (other than normal weathering) at time of substantial completion.

3.2 EXAMINATION

.1 Verify that openings for glazing are correctly sized and within tolerance.

.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.3 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Remove traces of primer, caulking.

.3 Remove glazing materials from finish surfaces.

.4 Remove labels after work is complete.

.5 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.

.6 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American National Standards Institute (ANSI).

.1 ANSI/ASTM E330/E330M - 14, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.2 American Society for Testing and Materials International, (ASTM).

.1 ASTM C542-05 (2011), Specification for Lock-Strip Gaskets.
.2 ASTM C920 Standard Specification for Elastomeric Joint Sealants
.3 ASTM D1003-13, Test Method for Haze and Luminous Transmittance of Plastics.
.4 ASTM C1349-10, Standard Specification for Architectural Flat Glass Clad Polycarbonate
.5 ASTM C1048-12. Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
.6 ASTM D1929-14, Test Method for Determining Ignition Temperature of Plastics.
.7 ASTM D2240-15, Test Method for Rubber Property - Durometer Hardness.
.8 ASTM E84-15b, Test Method for Surface Burning Characteristics of Building Materials.
.9 ASTM F1233-08, Test Method for Security Glazing Materials and Systems.

.3 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-12.1- M90, Tempered or Laminated Safety Glass.
.2 CAN/CGSB-12.2-M9, Flat, Clear Sheet Glass.
.3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
.4 CAN/CGSB-12.12-M90, Plastic Safety Glazing.

.4 Correctional Service Canada (CSC) Technical Criteria, 2015.

.5 Canadian Standards Association (CSA International).

.1 CSA Certification Program for Windows and Doors.

.6 Under Writer's Laboratory (UL)

.1 UL 2761 Sealants and Caulking Compounds

.7 Flat Glass Manufacturers Association (FGMA)

.1 FGMA Glazing Manual

.8 Laminators Safety Glass Association (LSGA)

.1 LSGA Laminated Glass Design Guide

1.2 SYSTEM DESCRIPTION

.1 Performance Requirements:

.1 Conform with CSC Technical Criteria, 2015.

1.3 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop Drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.3 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions where provided.

.4 Closeout Submittals:

.1 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00.

1.4 QUALITY ASSURANCE

.1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.2 Conform to performance requirements of AAMA/WDMA/CSA/101/I.S.2/A440.

.3 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 SITE CONDITIONS

.1 Environmental Requirements:

.1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.

.2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

.2 Divert metal cut-offs from landfill.

.3 Divert uninstalled materials for reuse at nearest used building materials facility or similar type facility.

.4 Divert unused caulking and sealant materials from landfill through disposal at special wastes depot.

.5 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

.6 Remove form site and dispose of packaging materials at appropriate recycling facilities.

.7 Dispose of packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

Part 2 Products

2.1 MATERIALS: INSULATING GLASS UNITS

.1 Double pane, fixed, CAN/CGSB 12.8; CAN/CGSB 12.1; low-e coating (surface 3); 6mm tempered; argon filled cavities;

.2 Accessories:

.1 Setting blocks: Neoprene, 80-90 Shore A durometer hardness to ASTM D2240, length of 25 mm for each square meter of glazing, minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height to suit glazing method, glass light weight and area.

.2 Spacer shims: Neoprene, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.

.3 Glazing tape: Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; black colour.

.4 Sealant: Silicone Sealant to ASTM C920, Type S, Grade NS; single component, non-sagging, non-staining, non-bleeding; colour to match existing.

.5 Glazing clips: manufacturer's standard type.

.6 Lock-strip gaskets: to ASTM C542.

2.2 MATERIALS: GLASS CLAD POLYCARBONATE

.1 Symmetrical glass clad polycarbonate; Grade 1 as per ASTM F1915; H.P White rating of Level IV-TP-0500.02, ASTM C1349-10, ASTM C1048-12.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 EXAMINATION

.1 Verify that openings for glazing are correctly sized and within tolerance.

.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.3 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Remove traces of primer, caulking.

.3 Remove glazing materials from finish surfaces.

.4 Remove labels after work is complete.

.5 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.

.6 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.5 PROTECTION OF FINISHED WORK

.1 After installation, mark light with an "X" by using removable plastic tape or paste.

END OF SECTION