

C.T.W. GUIDE NOTE: This master specification section includes C.T.W. GUIDE NOTES identified as “C.T.W. GUIDE NOTE” for information purposes and to assist the specification writer in making appropriate decisions. The C.T.W. GUIDE NOTE always immediately precedes the text to which it is referring. The section serves as a guideline only and should be edited with deletions and additions to meet specific project requirements.

C.T.W. GUIDE NOTE: This specification section follows the recommendations of the Construction Specifications Canada, Manual of Practice including MasterFormat, SectionFormat, and PageFormat. Optional text is indicated by square brackets []; delete the optional text including the brackets in the final copy of the specification. Delete the C.T.W. GUIDE NOTES in the final copy of the specification. Trade/brand names with appropriate product model numbers, styles and types are used in C.T.W GUIDE NOTES and in the specification text Article or Paragraph titled AAcceptable Material@. The Section is written for the Canadian industry with units of measurement shown in SI Metric and Imperial measurement following in parentheses.

1 GENERAL

1.01 SUMMARY OF WORK

- .1 This Section specifies thermally broken, stick-built, glazed wood & aluminum curtain wall and accessories.

1.02 RELATED REQUIREMENTS

C.T.W. GUIDE NOTE: Include in this Paragraph only those sections and documents that directly affect the work of this section. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the Paragraph below. Do not include Division 00 Documents or Division 01 Sections since it is assumed that all technical sections are related to all project Division 00 Documents and Division 01 Sections to some degree. Refer to other documents with caution since referencing them may cause them to be considered a legal part of the Contract. Edit the following paragraphs to suit specific project conditions.

- .1 Section [07 26 00 – Vapour Retarders].
- .2 Section [07 27 00 – Air Barriers].
- .3 Section [07 62 00 - Metal Flashing and Trim: Flashings].
- .4 Section [07 84 00 – Firestopping: Firestopping insulation].
- .5 Section [07 92 00 - Joint Sealing].
- .6 Section [08 80 00 – Glazing: Insulating glass units].

C.T.W. GUIDE NOTE: In the following Article, include only those reference standards which appear in the finished version of the project specification.

1.03 REFERENCE STANDARDS

- .1 Aluminum Association (AA)
 - .1 DAF 45 [2003], Designation System For Aluminum Finishes.
- .2 American Architectural Manufacturers Association (AAMA).
 - .1 AAMA-501-[2005], Methods of Test for Exterior Walls.
 - .2 AAMA-2603-[2002], Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 - .3 AAMA-2604-[2005], Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 - .4 AAMA-2605-[2005], Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
 - .5 AAMA CW DG-1-[96], Aluminum Curtain Wall Design Guide Manual.
 - .6 AAMA CW-10-[2004], Care and Handling of Architectural Aluminum From Shop to Site.

- .7 AAMA CW-11-[1985], Design Windloads for Buildings and Boundary Layer Wind Tunnel Testing.
- .8 AAMA-TIR A1-[2004], Sound Control for Fenestration Products.
- .3 ASTM International (ASTM).
 - .1 ASTM A653 / A653M – [09a], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B209-[07], Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .3 ASTM B221-[08], Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .4 ASTM C612 – [09], Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
 - .5 ASTM E283-[04], Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - .6 ASTM E331-[00], Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.
 - .7 ASTM E413 – [04], Classification for Rating Sound Insulation.
 - .8 ASTM E1105 – [00(2008)], Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.
 - .9 ASTM D2240 – [05], Standard Test Method for Rubber Property—Durometer Hardness.
- .4 Canada Green Building Council (CaGBC).
 - .1 LEED® Canada-NC Version 1.0-[2004], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations including Addendum 2007.
- .5 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-12.8-[97], Insulating Glass Units.
 - .2 CAN/CGSB-12.20-[M89], Structural Design of Glass for Buildings.
 - .3 CAN/CGSB-19.13-[M87], Sealing Compound, One-Component, Elastomeric, Chemical Curing.
- .6 CSA International (CSA)
 - .1 CAN/CSA-S157-[2005], Strength Design in Aluminum.
 - .2 CAN/CSA-S136-[2007], North American Specification for the Design of Cold-Formed Steel Structural Members.
 - .3 CAN/CSA W59.2-[M1991(R2003)], Welded Aluminum Construction.
 - .4 CAN/CSA C122 –Structural Glued Laminated Timber
 - .5 CAN/CSA 086-01-Engineering Design in wood
 - .6 CAN/CSA 0122-M89 –Glulam Appearance grade requirements.
 - .7 CAN/CSA 0112.7 Resorcinol and Phenol Resorconol Resin Adhesives for Wood
- .7 Environmental Choice Program (ECP)
 - .1 CCD-45-[1995], Sealants and Caulking Compounds.
- .8 Underwriter’s Laboratories of Canada (ULC)
 - .1 CAN/ULC-S710.1 [2005], Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials.

1.04 ADMINISTRATIVE REQUIREMENTS

- .1 Co-ordination: Co-ordinate work of this Section with work of other trades for proper time and sequence to avoid construction delays.

- .2 Pre-installation Meeting: Convene pre-installation meeting after Award of Contract and one week prior to commencing work of this Section to verify project requirements, substrate conditions and coordination with other building sub-trades, and to review manufacturer's written installation instructions.
 - .1 Comply with Section 01 31 19 - Project Meetings and co-ordinate with other similar pre-installation meetings.
 - .2 Notify attendees 2 weeks prior to meeting and ensure meeting attendees include as minimum:
 - .1 Owner;
 - .2 Consultant;
 - .3 Glazing subcontractor;
 - .4 Manufacturer's Technical Representative.
 - .3 Ensure meeting agenda includes review of methods and procedures related to glazed aluminum curtain wall installation including co-ordination with related work.
 - .4 Record meeting proceedings including corrective measures and other actions required to ensure successful completion of work and distribute to each attendee within 1 week of meeting.

C.T.W GUIDE NOTE: Article below includes submittal of relevant data to be furnished by Contractor.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Contract Conditions and Section 01 33 00 - Submittal Procedures.
- .2 Product Data: Submit product data including manufacturer's literature for glazed aluminum curtain wall extruded members, panels, components and accessories, indicating compliance with specified requirements and material characteristics.
 - .1 Submit list on curtain wall manufacturer's letterhead of materials, components and accessories to be incorporated into Work.
 - .2 Include product names, types and series numbers.
 - .3 Include contact information for manufacturer and their representative for this Project.
- .3 Shop Drawings: Submit drawings stamped and signed by Professional Engineer registered or licensed in [Province] [Territory] of [____], Canada. Include on shop drawings:
 - .1 Curtain wall panel and component dimensions, framed opening requirements and tolerances, adjacent construction, anchor details anticipated deflection under load, affected related Work, weep drainage network, expansion and contraction joint location and details, and field welding required. Indicate location of manufacturer's nameplates.
- .4 Samples:
 - .1 Submit duplicate 300 x 300 mm (12 x 12 inches) sample sections showing prefinished aluminum surface, finish, colour and texture, and including section of infill panel.
 - .2 Submit duplicate 300 x 300 mm (12 x 12 inches) sample sections of insulating glass unit showing glazing materials and edge and corner details.
- .5 Thermal Performance: Submit verification that Insulating Glass Units used in curtain wall system meet RSI (R) values specified.
- .6 Test Reports:
 - .1 Submit test reports showing compliance with specified performance characteristics and physical properties including air infiltration, water infiltration and structural performance.
- .7 Field Reports: Submit manufacturer's field reports within 3 days of manufacturer representatives site visit and inspection.
- .8 Sustainable Design (LEED).
 - .1 LEED Submittals: In accordance with Section [01 35 21 – LEED Requirements]
- .9 Installer Qualifications:
 - .1 Submit letter verifying installer's experience with work similar to work of this Section.

1.06 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data: Supply maintenance data for curtain wall for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

C.T.W. GUIDE NOTE: If LEED is not a part of the project delete the following Paragraph in its entirety.

- .2 Sustainable Design Closeout Documentation (LEED).
 - .1 Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates for work of this Section demonstrating percentage of construction wastes which were recycled.
 - .2 Submit verification from recycling facility showing receipt of materials.
- .3 Record Documentation: In accordance with Section 01 78 00 - Closeout Submittals.
 - .1 List materials used in curtain wall work.
 - .2 Warranty: Submit warranty documents specified.

1.07 QUALITY ASSURANCE

- .1 Sustainability Standards Certification (LEED).
 - .1 LEED Canada-NC Version 1.0 submittals: in accordance with Section 01 35 21 - LEED Requirements.

C.T.W. GUIDE NOTE: Consultant may want to construct a Mock-up to establish quality of work for the Project. The Mock-up can be used as a standard to which work on the Project can be compared. For smaller projects that do not have a separate Division 01 Section for quality assurance delete the reference to Section 01 43 00 – Quality Assurance. Delete the following paragraph and all of its subparagraphs if total area of curtain wall on the project is less than 1,400 square metres (15,000 square feet).

- .2 Mock-up: Construct full size [3 x 3 m (10 x 10 ft)] mock-up of vertical glazed aluminum curtain wall using proposed procedures, materials and quality of work where directed by Consultant [and in accordance with Section 01 43 00 - Quality Assurance].
 - .1 Include intermediate mullion, [corner mullion] [sill] [column cover] vision glass light, and insulated infill panel.
 - .2 Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.
 - .3 Purpose: To judge quality of work and material installation.
 - .4 Allow Consultant [24] hours minimum prior to inspection of mock-up.
 - .5 Do not proceed with work prior to receipt of written acceptance of mock-up by Consultant.
 - .6 When accepted, mock-up will demonstrate minimum standard of quality required for work of this Section.
 - .7 Approved mock-up will [not] remain part of finished work.

C.T.W. GUIDE NOTE: The following Article although not part of Quality Assurance, can be used to enhance the quality of materials by ensuring that they are delivered and handled properly at the work site.

1.08 DELIVERY STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements:
 - .1 Deliver material in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Deliver fabricated wood & aluminum curtain wall materials and components in manufacturer's original packaging with identification labels intact and in sizes to suit project.
- .2 Material Handling: To AAMA CW-10 and C.T.W. guidelines for handling and storage of GLULAM wood.
- .3 Storage and Handling Requirements: Store materials off ground and protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
 - .1 Material storage: To AAMA CW-10.
- .4 Packaging Waste Management:

C.T.W.GUIDE NOTE: For smaller projects that do not have a separate Section for waste management and disposal, delete the following paragraph.

- .1 Separate and recycle waste packaging materials in accordance with Section 01 74 19 - Construction Waste Management and Disposal.
- .2 Remove waste packaging materials from site and dispose of packaging materials at appropriate recycling facilities.

C.T.W.GUIDE NOTE: For smaller projects that do not have a Waste Management Plan, delete the option referring to a Waste management Plan.

- .3 Collect and separate for disposal paper and plastic material in appropriate on-site storage containers for recycling [in accordance with Waste Management Plan].

1.09 WARRANTY

- .1 Project Warranty: Refer to Contract Conditions for project warranty provisions.
- .2 Manufacturer's warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not intended to limit other rights Owner may have under Contract Conditions.

C.T.W.GUIDE NOTE: Coordinate article below with manufacturer's warranty requirements.

- .3 Warranty period: [1] [5] years commencing on Date of Substantial Performance of Work.
 - .1 Insulating glass units: [10] years, on Date of Substantial Performance of Work.

2 PRODUCTS

2.01 MANUFACTURER

- .1 Manufacturer:: C.T.WINDOWS INC. www.ctwindowsinc.com . Contact ETG John Robis 905-697-3397 tel; 905-981-8675 fax

2.02 DESCRIPTION

- .1 Thermally broken, vertical stick-built glazed wood & aluminum curtain wall system of engineered wood sections with [self supported] [supplementary supported] framing, shop fabricated, factory prefinished]; related flashings, anchorage and attachment devices.

2.03 DESIGN CRITERIA

- .1 Design curtain wall to include the following
 - .1 Design glazed aluminum curtain wall following rainscreen principles.
 - .2 Ensure horizontal members are sealed to vertical members to form individual compartments in accordance with rainscreen principles.
 - .3 Ventilate and pressure equalize air space outside exterior surface of insulation to exterior.
- .2 Design aluminum components to [CAN/CSA S157].
- .3 Design and size curtain wall components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of wall using design pressure of [0.95 kPa (20 psf)] to [AAMA CW 11] [ASTM E330].
 - .1 Design curtain wall system for expansion and contraction caused by cycling temperature range of [95] degrees C over [12] hour period without causing detrimental effect to system components.

C.T.W. GUIDE NOTE: Consideration should be given to the colour of the curtain wall system when calculating expansion and contraction since darker colours will have a greater coefficient of expansion than lighter colours.

- .2 Thermal expansion: Ensure curtain wall system can withstand temperature differential of [85] degrees C and is able to accommodate interior and exterior system expansion and contraction without damage to components or deterioration of seals.
- .3 Design vertical expansion joints with baffled overlaps and compressed resilient air seal laid between mullion ends.
- .4 Ensure system is designed to accommodate:
 - .1 Movement within curtain wall assembly.
 - .2 Movement between system and perimeter framing components.
 - .3 Dynamic loading and release of loads.
 - .4 Deflection of structural support framing.
 - .5 Shortening of building concrete structural columns.
 - .6 Creep of concrete structural members.
 - .7 Mid-span slab edge deflection: [] mm maximum.
- .5 Thermal resistance:
 - .1 Spandrel areas: [RSI 3.0 (R 16.8)].

C.T.W. GUIDE NOTE: The RSI or R value for the glass areas of the curtain wall is totally dependent not only on whether a double or triple pane Insulating Glass Unit (IGU) is used, but also upon the manufacturer of the IGU. Check the IGU manufacturer's technical literature before specifying the RSI or R values.

- .2 Vision glass areas: Insulating Glass Unit [RSI [] (R [])].
- .6 Limit mullion deflection to [flexure limit of glass [19] mm (0.75 inches)] [L/175] [L/200] [L/240] maximum with full recovery of glazing materials.
- .7 Deadload prevention: Design curtain wall system with separate, integrated support for insulating glass units.

C.T.W. GUIDE NOTE: Check with local authority having jurisdiction to determine local STC rating requirements.

- .8 Sound attenuation through wall system (exterior to interior): STC [45] to [AAMA T1R - A1] [ASTM E413].
- .9 Glass dimensions: Size glass units to CAN/CGSB-12.20.
- .10 Flatness criteria: [6] mm ([0.25] inches) maximum in [6] m (20 feet) for each panel.

C.T.W. GUIDE NOTE: Air infiltration in both the AAMA 501 and ASTM E283 standards are measured in m³/s/m² in lieu of the preferred designation of l/s/m². In Canada the recognized SI Metric unit of measurement is the litre (L) and is used in this specification. There are 1,000 litres in a cubic metre.

- .11 Air infiltration: [0.3] L/s/m² ([0.63] cfm) maximum of wall area to [AAMA 501] [ASTM E283] at differential pressure across assembly of [300] Pa (0.044 psi).
- .12 Water infiltration: None to [AAMA 501] [ASTM E331] [ASTM E1105] at differential pressure across assembly of [720] Pa (0.104 psi).
- .13 Ensure interior surfaces have no condensation before exposed edges of sealed units reach dew point temperatures during testing to [AAMA 501].
- .14 Maintain continuous air barrier and vapour retarder throughout building envelope and curtain wall assembly.
- .15 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.
- .16 Reinforce curtain wall system to accommodate window washing guide rails where indicated.

2.04 MATERIALS

- .1 Curtain Wall System and Components:
 - .1 Extruded aluminum: To ASTM B221, 6063 alloy with [T5] [T6] temper.

C.T.W.GUIDE NOTE: Class I coatings are thicker than Class II coatings.

- .1 Finish coatings: To [AAMA 2603] [AAMA 2604] [AAMA 2605] [AA DAF 45 Architectural Class I] [AA DAF 45 Architectural Class II], clear anodized [10 µm (0.0004 inches)] [18 µm (0.0007 inches)] thick minimum.
- .2 Sheet aluminum: To [ASTM B209], utility grade for unexposed surfaces.
- .3 Air barrier liner: Reinforce panels to maintain flat surface.
 - .1 Concealed locations: [0.952 mm (20 gauge) steel sheet to [CSA-S136M] [ASTM A653/A653M] with [458 g/m² (1.25 oz/sq.ft)] galvanized coating and corners sealed at concealed locations.
 - .2 Interior exposed locations: [1.588 mm (16 gauge)] clear anodized aluminum sheet.
- .4 Fasteners, screws and bolts: Tamperproof, cadmium plated stainless steel [300] [or] [400] series to meet curtain wall requirements and as recommended by manufacturer.
- .5 Anchors: Ensure anchors have three-way adjustment.

C.T.W.GUIDE NOTE: Retain the following paragraph if insulating glass units are specified in another Section. Delete the paragraph if they are specified here.

- .6 Insulating glass units: In accordance with Section [08 80 00 – Glazing].
- .7 Insulating glass units: To [CAN/CGSB-12.8], [double] [triple] glazed, hermetically sealed, argon filled insulating glass units with low conductance [black] stainless steel warm edge spacer.
 - .1 Outer lite: [6] mm ([0.25] inches) clear float glass with low-E coating on surface two.

C.T.W.R GUIDE NOTE: Retain the following paragraph if a triple glazed insulating glass unit is used. Delete the paragraph for double glazed units.

- .2 Centre lite: [6] mm ([0.25] inches) heat strengthened clear float glass.
- .3 Inner lite: [6] mm ([0.25] inches) clear float glass with low-E coating on surface five.
- .8 Aluminum panels: [3] mm (0.125 inches) thick factory formed panels.
 - .1 Finish after forming to match curtain wall system.
- .9 Thermal Break: Glass fibre reinforced polyamide porthole extrusion.
- .10 Curtain wall back pan insulation: [100] mm ([4] inches) thick.
 - .1 Density: [64] kg/m³ ([4] lbs/cu ft) minimum.
 - .2 Thermal resistance: RSI [3.0] (R [16.8]).
- .2 Acceptable Material: Alumicor Ltd., ThermaWall 2600 Series.

2.05 CURTAIN WALL SYSTEM FABRICATION

- .1 Do aluminum welding to CAN/CSA W59.2.
- .2 Fabricate aluminum assemblies of extruded sections to sizes and profiles indicated.
 - .1 Ensure vertical and horizontal members are tubular extrusions designed for shear block corner construction.
 - .2 Mullion depth sizes as indicated.
 - .3 Cap depth sizes: [19 mm (0.75 inches)].
 - .4 Structural silicone joints where indicated.
 - .5 Ensure caps for mullion assemblies are constructed without gap.
- .3 Construct units square, plumb and free from distortion, waves, twists, buckles or other defects detrimental to performance or appearance.
 - .1 Ensure curtain wall is fabricated with separate, integrated support for insulating glass unit.
 - .2 Do glazing in accordance with Section [08 80 00 – Glazing].
 - .3 Site glazing is permitted.
- .2 Fabricate curtain wall with minimum clearances and shim spacing around panel perimeter and ensure installation and dynamic movement of perimeter seal is enabled.

- .3 Fabricate infill panels with metal covered edge seals around perimeter of panel assembly, enabling installation and minor movement of perimeter seal.
 - .1 Reinforce interior surface of exterior infill panel sheet from deflection caused by wind and suction loads.
 - .2 Place insulation within infill panel adhered to exterior face of interior panel sheet over entire area of sheet using impale fasteners with integral discs.

C.T.W.GUIDE NOTE: Co-ordinate the following paragraph with the drawings to ensure that required mechanical and electrical equipment is adequately indicated.

- .3 Reinforce infill panels to receive [convector cabinet] [finned tube radiation cabinet] [electrical component] brackets and attachments as indicated.
- .4 Accurately fit and secure joints and corners.
 - .1 Ensure joints are flush, hairline, [and weatherproof].
- .5 Prepare curtain wall to receive anchor devices.
- .6 Use only concealed fasteners
 - .1 Ensure fasteners do not penetrate thermal break.
 - .2 Where fasteners cannot be concealed, countersunk screws finished to match adjacent material may be used upon receipt of written approval from Consultant.

C.T.W. GUIDE NOTE: Co-ordinate the following paragraph with the drawings to ensure that automatic entrances, revolving doors, storefront and other doors are adequately indicated.

- .7 Prepare components to receive doors and openings as indicated.

C.T.W.GUIDE NOTE: Co-ordinate the following paragraph with the drawings to ensure that drapery track, projection screens, notice boards and other items or components that may be hung from the curtain wall head rails are adequately indicated.

- .8 Reinforce head rail of interior components to receive track brackets and attachments as indicated.

C.T.W.GUIDE NOTE: Co-ordinate the following paragraph with the drawings to ensure that such things as window cleaning equipment are adequately indicated.

- .9 Reinforce framing members for exterior imposed loads where required.
- .10 Visible manufacturer's labels are not permitted.

2.06 FINISHES

C.T.W. GUIDE NOTE: Choose one of the following three paragraphs to specify the finish on exposed aluminum exterior surfaces.

- .1 Exterior exposed aluminum surfaces: To [AAMA 2604, 2-coat, thermal setting enamel consisting of primer and topcoat] [AAMA 2605, 3-coat, thermal setting enamel consisting of primer, colour coat and clear coat] with [70] % minimum fluoropolymer resin and polvinylidene fluoride (PVDF)], [0.025 mm (1 mil)] [0.03 mm (1.2 mil)] minimum total thickness coloured [_____].

C.T.W.GUIDE NOTE: Duranar XL is a thicker more durable finish than Duranar. Some colours such as metallics are only available as Duranar XL finishes.

- .1 Acceptable material; PPG Industries Inc., [Duranar] [Duranar XL].

C.T.W.GUIDE NOTE: For Alumicor products, Class 1 is available in Clear, Champagne, Light Bronze and Black. Class II is only available as a Clear anodized finish.

- .2 Exterior exposed aluminum surfaces: To AA DAF-45-M12C22A44, Architectural [Class I], [clear] anodized [18 µm (0.0007 inches)] minimum thickness coloured [_____].
 - .1 Acceptable material: Alumicor Ltd., Class I Anodic Finish.

.3 Exterior exposed aluminum surfaces: To AA DAF-45-M12C22A31, Architectural Class II, clear anodized [10 µm (0.0004 inches)] minimum thickness.

.1 Acceptable material: Alumicor Ltd., Class II Anodic Finish.

C.T.W.GUIDE NOTE: Choose one of the following three paragraphs to specify the finish on exposed aluminum interior surfaces.

.4 Interior exposed aluminum surfaces: To [AAMA 2603, 1-coat pigmented organic thermal setting finish] [AAMA 2604, 2-coat, thermal setting enamel consisting of primer and topcoat with [70] % minimum fluoropolymer resin and polyvinylidene fluoride (PVDF)], [0.019 mm (0.75 mil)] [0.025 mm (1 mil)] minimum total thickness coloured [bronze].

C.T.W.GUIDE NOTE: Duranar is a thicker more durable finish than Duracron, Duracron should not be used for exterior finishes. Some colours such as metallics are only available as Duranar XL finishes.

.1 Acceptable material; PPG Industries Inc., [Duracron] [Duranar].

C.T.W.GUIDE NOTE: For Alumicor products, Class 1 is available in Clear, Champagne, Light Bronze and Black. Class II is only available as a Clear anodized finish.

.5 Interior exposed aluminum surfaces: To AA DAF-45-M12C22[A41][A44], Architectural Class I, anodized [18 µm (0.0007 inches)] minimum thickness coloured [clear][_____].

.1 Acceptable material: Alumicor Ltd., Class I Anodic Finish.

.6 Interior exposed aluminum surfaces: To AA DAF-45-M12C22A31, Architectural Class II, clear anodized [10 µm (0.0004 inches)] minimum thickness.

.1 Acceptable material: Alumicor Ltd., Class II Anodic Finish.

2.07 ACCESSORIES

C.T.W.GUIDE NOTE: Use the following paragraph if insulation for infill panels is specified in another Section. Delete paragraph if insulation is specified in this Section.

.1 Insulation: In accordance with Section [07 21 13 – Board Insulation].

C.T.W.GUIDE NOTE: Use the following paragraph if insulation for infill panels is specified in this Section. Delete the paragraph if the insulation is specified in another section. Co-ordinate this paragraph with Section 07 21 13 – Board Insulation. The use of Roxul's CurtainRock may contribute more towards LEED credits.

.2 Fibre board: to [ASTM C612].

.1 Type: [1VB].

.2 Density: [64 kg/m³ (4 lbs per cu.ft.)] minimum.

.3 Thickness: [100 mm (4 inches)] minimum.

.4 Acceptable material: Roxul Inc., CurtainRock.

C.T.W.GUIDE NOTE: The application of caulking releases volatile organic compounds (VOCs) into the atmosphere. VOCs contribute to numerous environmental problems including the degradation of indoor air quality, the formation of ground level ozone and photochemical smog. The specification of caulking and sealants that have a low VOC content and reduced toxicity will help to protect the environment and reduce possible adverse health effects. The specification of products that are certified to meet the specification of the Environmental Choice Program CCD-45 will provide reduced environmental impacts. The use of lower VOC products contributes more towards LEED credits.

.3 Gasketing: To [CCD-45] Silicone compatible rubber or extruded silicone gaskets.

.4 Setting Blocks: To [CCD-45] and [ASTM D2240], [neoprene] [EPDM] [silicone], [80 - 90] Shore A Durometer hardness.

.5 Spacers: To [CCD-45] and [ASTM D2240], [neoprene] [EPDM] [silicone], [50 - 60] Shore A Durometer hardness.

.6 Sealant: To [CAN/CGSB-19.13], Class 40, one-component, cold-applied, non-sagging silicone.

.1 Acceptable material: Dow Corning 795.

- .7 Sealant Bond Breaker: Open cell foam backer rod sized to suit project requirements.
- .8 Flashings: [3] mm (0.125 inches) thick aluminum flashing to profiles indicated [and in accordance with Section 07 62 00 - Sheet Metal Flashing and Trim].
- .9 Liquid Foam Insulation: Single component, moisture cure, low expansion rate spray-in-place polyurethane liquid foam insulation to ULC-S710.1 and in accordance with manufacturer's written recommendations.
- .10 Miscellaneous Components: Covers, copings, special flashings, filler pieces, termination pieces, cap closures, expansion joint covers, and metal bellows to match curtain wall system as indicated.

2.08 PRODUCT SUBSTITUTIONS

- .1 Substitutions: [In accordance with Section 01 23 13 - Product Substitution Procedures] [No substitutions permitted].
- 2. Ensure components come from one manufacturer.

3 EXECUTION

3.01 INSTALLERS

C.T.W.GUIDE NOTE: Alumicor authorized installers use only Alumicor manufactured or approved components. Other installers may substitute other manufacturer's materials.

- .1 Use only [Alumicor authorized installers for] [installers with 2 years minimum experience in work similar to] work of this Section.

3.02 EXAMINATION

- .1 Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for curtain wall installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Consultant.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.03 INSTALLATION

- .1 Install curtain wall in accordance with manufacturer's written instructions.
- .2 Do aluminum welding to CAN/CSA W59.2.
- .3 Attach curtain wall assemblies to structure plumb and level, free from warp, and allow for sufficient adjustment to accommodate construction tolerances and other irregularities.
 - .1 Maintain dimensional tolerances and align with adjacent work.
 - .2 Use alignment attachments and shims to permanently fasten elements to building structure.
 - .3 Clean welded surfaces and apply protective primer to field welds and adjacent surfaces.
- .4 .Install thermal isolation where components penetrate or disrupt building insulation.
- .5 Install sill flashings.
- .6 Co-ordinate installation of fire stop insulation, in accordance with Section [07 84 00 - Firestopping], at each floor slab edge [and intersection with vertical construction where indicated].

- .7 Install smoke sealing in accordance with Section [07 80 00 – Fire and Smoke Protection] where indicated.
- .8 Co-ordinate attachment and seal of perimeter air barrier in accordance with Section [07 27 00 – Air Barriers].
- .9 Co-ordinate attachment and seal of perimeter vapour retarder in accordance with Section [07 26 00 – Vapour Retarders].
- .10 Install [fibrous insulation] [liquid foam insulation] in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- .11 Install insulating glass units and infill panels in accordance with Section [08 80 00 - Glazing] and to manufacturer's written instructions.
- .12 Install perimeter sealant [to method required to achieve performance criteria, backing materials, and installation criteria in accordance with Section [07 92 00 - Joint Sealing].

3.04 FIELD QUALITY CONTROL

- .1 Field Inspection: Coordinate field inspection in accordance with Section [01 45 00 - Quality Control].
- .2 Site Installation Tolerances:
 - .1 Variation from plumb: [12 mm per 30 m (0.5 inches per 100 feet)] maximum.
 - .2 Misalignment of two adjacent panels or members: [0.8 mm (0.03 inches)] maximum.
 - .3 Sealant space between curtain wall and adjacent construction: [13 mm (0.5 inches)] maximum.

C.T.W.GUIDE NOTE: Specify requirements if manufacturers are to provide field quality control with onsite personnel for instruction or supervision of product installation, application, erection or construction. Manufacturer field reports are included under PART 1, Action and Informational Submittals.

- .3 Manufacturer's Services:

C.T.W.GUIDE NOTE: Use the following Paragraphs only when manufacturer's technical support and assistance services are required to help assess the suitability of product application and the quality of the fabricated and/or installed components. Establish the nature, number and duration of the technical services to be provided by the manufacturer and specify below. Consult the manufacturer for services required. Delete if field services are not required.

- .1 Coordinate manufacturer's services with Section [01 45 00 - Quality Control].
- .2 Submit to Consultant a written agreement from the manufacturer to perform the manufacturer's services.
- .3 Schedule manufacturer's review of work procedures at stages listed:
 1. Product Application: [1] off site review[s].
 2. Fabrication and Handling: [1] review[s] at authorized installers fabrication facilities.
 3. Installation: [3] site reviews at [commencement of Work] [50% completion of Work] [Upon completion of Work].
- .4 Submit manufacturer's written reports to Consultant describing:
 - .1 The scope of work requested.
 - .2 Date, time and location.
 - .3 Procedures performed.
 - .4 Observed or detected non-compliances or inconsistencies with manufacturers' recommended instructions.
 - .5 Limitations or disclaimers regarding the procedures performed.
 - .6 Obtain reports within seven days of review and submit immediately to Consultant.

3.05 CLEANING

C.T.W.GUIDE NOTE: For smaller projects that do not have a separate Division 01 Section for cleaning, delete the reference to Section 01 74 00 – Cleaning in the following two Paragraphs.

- .1 Progress Cleaning: Perform cleanup as work progresses [in accordance with Section 01 74 00 - Cleaning and Waste Management].
 - .1 Leave work area clean end of each day.
- .2 Final leaning: Upon completion, remove surplus materials, rubbish, tools, and equipment [in accordance with Section 01 74 00 – Cleaning and Waste Management].
- .3 Waste Management:
 - .1 Co-ordinate recycling of waste materials with 01 74 19 - Construction Waste Management and Disposal.
 - .2 Collect recyclable waste and dispose of or recycle field generated construction waste created during construction or final cleaning related to work of this Section.
 - .3 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.06 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by glazed aluminum curtain wall installation.

END OF SECTION 08 44 13 - GLAZED ALUMINUM CURTAIN WALLS (THERMAWALL 2600)