Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

Agri-Environment Services Branch | Direction générale des services agroenvironnementaux

AGRICULTURE AND AGRI-FOOD CANADA

PROJECT TECHNICAL SPECIFICATIONS

AGRICULTURAL RESEARCH CENTRE SKYLIGHT GLAZING REPLACEMENT

KGS GROUP 20-0217-001
JULY 2020

DRAWING LIST

DRAWING NUMBER	TITLE
20-0217-001 B01	Part Roof – Skylights – Plan, Sections & Details
20-0217-002 B02	Notes

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are co-ordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative’s review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative’s review.

.10 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Submit Shop Drawings stamped and signed by professional engineer registered or licensed in British Columbia, Canada.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow seven (7) Business Days for review of each submission by the Departmental Representative.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in Shop Drawings as the Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify the Departmental Representative in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter, containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each Shop Drawing, product data and sample.
- .5 Other pertinent data.

.8 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.9 After Departmental Representative’s review, distribute copies.

.10 Submit electronic copy of Shop Drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by the Departmental Representative where Shop Drawings will not be prepared due to standardized manufacture of product.

.12 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by the Departmental Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within three (3) years of date of Contract award for project.

.13 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by the Departmental Representative.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.14 Submit electronic copies of manufacturers instructions for requirements requested in specification Sections and as requested by the Departmental Representative.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.15 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by the Departmental Representative.

.16 Submit documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.17 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by the Departmental Representative.

.18 Delete information not applicable to project.

.19 Supplement standard information to provide details applicable to project.

.20 If upon review by the Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, a copy will be returned and fabrication and installation of Work may proceed. If Shop Drawings are rejected, noted copy will be returned and resubmission of corrected Shop Drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.21 The review of shop drawings by the Departmental Representative is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that

pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.3 DESCRIPTION OF CONSTRUCTION METHODS

.1 The Contractor shall, if required by the Departmental Representative, submit for the review of the Departmental Representative method statements which describe in detail, supplemented with drawings where necessary, the methods to be adopted for executing any portion of Work.

.2 These method statements shall also include details of constructional plan and labour to be employed. Acceptance by the Departmental Representative shall not relieve the Contractor of any of his responsibilities, nor shall reasonable refusal to approve entitle the Contractor to extra payment or an extension of time.

1.4 REQUESTS FOR INFORMATION

.1 In the event that the Contractor, or any Subcontractor involved in the Work, determines that some portion of the Drawings, Specifications, or other Contract Documents requires clarification or interpretation by the Departmental Representative, the Contractor shall submit a Request for Information (RFI) in writing to the Departmental Representative.

.2 Submission Procedure:

.1 Number RFI's consecutively in one sequence in order submitted, in a numbering system established by the Departmental Representative.

.2 Submit one distinct subject per RFI request. Do not combine unrelated items on one form.

.3 Submit with RFI all necessary supporting documentation.

.3 In the RFI, the Contractor shall clearly and concisely set forth:

.1 the issue for which clarification or interpretation is sought and why a response is needed from the Departmental Representative; and

.2 an interpretation or understanding of the requirement along with reasons why such an understanding was reached.

.4 The Departmental Representative will review all RFIs to determine whether they are valid RFIs. If it is determined that the document is not a valid RFI, it will be returned to the Contractor not having been reviewed with an explanation why it was deemed not valid.

.5 A RFI response shall be issued within 14 Calendar Days of receipt of the request from the Contractor unless the Departmental Representative determines that a longer time is necessary to provide an adequate response. When the RFI submission is received by the Departmental Representative before noon, the review period commences on that Calendar Day. When the RFI submission is received by the Departmental Representative after noon, the review period commences on the subsequent Calendar Day.

.6 If, at any time, the Contractor submits a large number of RFIs or the Departmental Representative considers the RFI to be of such complexity that the Departmental Representative cannot process the RFIs within 14 Calendar Days, the Departmental Representative shall confer with the Contractor within five (5) Calendar Days of receipt of such RFIs and the Departmental Representative and the Contractor will jointly prepare

an estimate of the time necessary for processing same as well as an order of priority among the RFIs submitted. The Contractor shall accommodate such necessary time at no impact to the schedule and at no additional cost to the Contract.

.7 If the Contractor submits a RFI on an activity with 14 Calendar Days or less of available time to the impacted activity on the current project schedule, the Contractor shall not be entitled to any time extension due to the time it takes the Departmental Representative to respond to the request provided that the Departmental Representative responds within the 14 Calendar Days set forth above.

.8 A RFI response from the Departmental Representative will not change any requirement of the Contract. In the event the Contractor believes that the RFI response from the Departmental Representative will cause a change to the requirements of the Contract, the Contractor shall within 14 Calendar Days give written notice to the Departmental Representative stating that the Contractor believes the RFI response will result in a change in requirements to the Contract and the Contractor intends to submit a change request. Failure to give such written notice of 14 Calendar Days shall waive the Contractor's right to seek additional time or cost under the requirements of the Contract.

1.5 MISCELLANEOUS SUBMITTALS

.1 Prepare and submit submittals required by individual Specification sections.

.2 Copies: Submit one electronic copy to Departmental Representative. Method of electronic submission to be coordinated with Departmental Representative after execution of the Contract. Submit hard copies only where specifically required under individual Specification sections.

.3 Departmental Representative will review submittals for general conformance with design concept and intent, and general compliance with Contract.

.4 Departmental Representative review does not relieve Contractor from compliance with requirements of Contract nor from errors in submittals or Contractor's design.

.5 Contractor is responsible for confirmation of dimensions at jobsite; fabrication processes; means, methods, techniques, sequences. and procedures of construction; coordination of work of all trades; and performance of Work in safe and satisfactory manner.

.6 At Departmental Representative's option, Departmental Representative's review comments and review stamp will be placed either directly on submitted copies of submittals or on separate submittal review comment form.

.7 Where work is to be designed by Contractor, comply with applicable codes and furnish submittals signed and sealed by professional engineer licensed in Province of British Columbia, as required by Specifications. If requested, calculations shall be submitted for review. Calculations shall also be signed and sealed by a professional engineer registered in the Province of British Columbia.

1.6 SAMPLES

.1 Upon request, submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Departmental Representative.

.3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.7 PHOTOGRAPHIC DOCUMENTATION

.1 Upon request, submit electronic copy of colour digital photography in jpg format, standard resolution as directed by Departmental Representative.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Frequency of photographic documentation: as directed by Departmental Representative.

1.8 CLOSEOUT SUBMITTALS

.1 Refer to Section 01 78 00 – Closeout Submittals for closeout submittal requirements.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 INSPECTION

.1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Departmental Representative may order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.2 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.3 PROCEDURES

.1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

.4 Upon request, submit samples and/or materials for review by Departmental Representative. Submit with reasonable promptness and in orderly sequence so as not the cause delay in the Work.

1.4 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative will deduct from Contract Price difference in value between Work

performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.5 REPORTS

.1 Submit electronic copies of inspection and test reports to Departmental Representative.

.2 Provide copies to subcontractor of work being inspected or tested, and manufacturer or fabricator of material being inspected or tested.

1.6 TESTS AND MIX DESIGNS

.1 Furnish test results as requested.

.2 Cost of tests beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

.3 The Contractor shall carry out smoke testing and water leakage testing in general accordance with ASTM E 1186-87 “Standard Practices for Air Leakage Site Detection in Building Envelopes” and AAMA 501.2 “Field Check of Metal Curtain Walls for Water Leakage” to determine effectiveness of work at eliminating air and water leakage respectively.

.4 If on testing, work is suspected to be not in accordance with contract documents and intent of work stated, the Departmental Representative may request the work be uncovered.

.5 If, upon examination, work is found to be not in accordance with contract documents and intent of work, correct and pay for the cost of examination and correction.

1.7 MILL TESTS

.1 Submit mill test certificates as requested.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meeting:

.1 Convene meeting one (1) week prior to contract completion (Total Performance) with Departmental Representative to:

.1 Verify Project requirements.

.2 Review warranty requirements.

.2 Departmental Representative to establish communication procedures for:

.1 Notifying construction warranty defects.

.2 Determine priorities for type of defects.

.3 Determine reasonable response time.

.3 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Provide evidence, if requested, for type, source and quality of products supplied.

1.3 FORMAT

.1 Organize data as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279mm with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings.

.1 Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab.

.1 Bind in with text; fold larger drawings to size of text pages.

.9 Content to include but not limited to: Drawings, shop drawings, material data sheets from manufacturers, cleaning and maintenance instructions, cleaning and maintenance schedule, warranty information

1.4 AS -BUILT DOCUMENTS AND SAMPLES

.1 After award of Contract, the Departmental Representative will provide a complete set of Drawings for the purpose of maintaining project as-built drawings. Accurately mark-up deviations from the Contract caused by the Site conditions and changes ordered by the Departmental Representative.

.2 The Contractor shall keep one complete set of white prints at the Site during the Work, including all addenda, change orders, Site instructions, clarifications, and revisions for the purpose of the as-built drawings. As the Work on-site proceeds, the Contractor shall clearly mark up the white prints in red pencil all the Work which deviated from the original Contract. Identify Drawings as "Project Record Copy". Maintain in good condition and make available for inspection on-site by the Departmental Representative at all times.

.3 Record information concurrently with construction progress.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:

.1 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.2 Field changes of dimension and detail.

.3 Changes made by change orders.

.4 Details not on original Contract Drawings.

.5 Referenced Standards to related shop drawings and modifications

.5 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to Contract.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.6 Keep record documents and samples available for inspection by Departmental Representative.

.7 Provide digital photos, if requested, for site records.

1.5 MATERIALS AND FINISHES

.1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional requirements: as specified in individual specifications sections.

1.6 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty meeting, to Departmental Representative for approval.

.3 Warranty management plan to include required actions and documents to assure that the Owner receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.

.6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten (10) business days after completion of applicable item of work.

.4 Verify that documents are in proper form, contain full information, and are notarized.

.5 Co-execute submittals when required.

.6 Retain warranties and bonds until time specified for submittal.

.7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Total Performance is determined.

.8 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.

.2 Listing and status of delivery of Certificates of Warranty for extended warranty items.

.3 Provide list for each warranted equipment, item, feature of construction or system indicating:

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of manufacturers or suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.4 Procedure and status of tagging of equipment covered by extended warranties.

.5 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.9 Respond in timely manner to oral or written notification of required construction warranty repair work.

.10 Written verification to follow oral instructions.

.1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM A 653/A 653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM F1667-15 Standard Specification for Driven Fasteners: Nails, Spikes and Staples.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.

.3 Canadian Roofing Contractors Association (CRCA)

.1 Roofing Specifications Manual 2012.

.4 Canadian Sheet Steel Building Institute (CSSBI)

.1 CSSBI S8-2008 Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products.

.2 CSSBI Sheet Steel Facts #12 2003 Fastener Guide for Sheet Steel Building Products.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's printed product literature including product specifications and technical data sheets for sheet metal flashing fasteners and accessory materials. Include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit shop drawings for all sheet metal fabrications.

.2 Indicate sheet thickness, flashing dimensions and fastenings. Include anchorage, expansion joints and other provisions for thermal movement.

.3 Submit manufacturer’s catalogue cut sheets for manufactured items.

.4 Samples:

.1 If requested, submit 50 x 50 mm samples of each type of sheet metal material, finishes and colour.

1.3 PRE-INSTALLATION MEETING

.1 Include sheet metal flashing and trim on agenda of pre-installation meetings of affected sections.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's instructions.

.2 Handle and store flashing materials to prevent creasing, buckling, scratching, or other damage.

Part 2 Products

2.1 BASE SHEET METAL MATERIALS

.1 Provide base sheet metal in thickness to match existing, but not less than 24 gauge or as recommended in SMACNA for type of item being fabricated and as required by the authority having jurisdiction.

.2 Zinc coated steel sheet: Z275 designation zinc coating.

2.2 PREFINISHED STEEL SHEET

.1 Prefinished steel sheet with coating system consisting of base metal pre-treatment, primer, silicone modified polyester or polyester topcoat meeting requirements of CSSBI S8.

.1 Finished colour: to match existing.

2.3 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint as required.

.2 Loose laid underlay for metal flashing: No. 15 perforated asphalt felt to CSA A123.3.

.3 Self-adhesive membrane underlay and tie-in membrane for metal flashings: To CSA A123.22 or ASTM D1970.

.4 Sealants: as specified in 07 92 00 – Joint Sealing.

.5 Cleats and hook strips: of same material, and temper as sheet metal, minimum one-third width of secured flashing. Thickness: same as sheet metal being secured.

.1 Provide continuous hook strip at outside of parapets.

.6 Screws: of same material as sheet metal, Suitable for substrate and material being fastened, galvanized, coloured head, neoprene washer.

.7 Touch-up paint: as recommended by prefinished material manufacturer.

2.4 FABRICATION

.1 Fabricate sheet steel flashings and other sheet steel work [in accordance with applicable CRCA 'FL' series details] [as indicated] [and SMACNA [architectural] [residential] details] .

.2 Form pieces in 2400 mm maximum lengths.

.1 Make allowance for expansion at joints.

.3 Hem exposed edges on underside 12 mm.

.1 Mitre and seal corners with sealant.

.4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

2.5 METAL FLASHINGS

.1 Form flashings, copings and fascias to profiles required.

2.6 REGLETS AND CAP FLASHINGS

.1 Form metal cap flashing to profiles as required.

.1 Provide slotted fixing holes and steel washer fasteners.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Install sheet metal work as scheduled.

.2 Use concealed fastenings except where approved before installation.

.3 Provide underlay under sheet metal.

.1 Secure in place and lap joints 100 mm.

.2 Provide self-adhesive membrane to tie into adjacent assemblies.

.4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs.

.1 Flash joints using S-lock forming tight fit over hook strips.

.5 Lock end joints and caulk with sealant.

.6 Install surface mounted reglets true and level, and caulk top of reglet with sealant.

.7 Insert metal flashing under cap flashing to form weather tight junction.

.8 Caulk flashing at cap flashing with sealant.

.9 Where flashing installed with mechanical fasteners, install fasteners in slots or oversize holes to allow expansion and contraction of flashings.

.10 Provide isolation coating or impervious self-adhesive membrane to separate aluminum items from concrete and masonry.

3.3 CLEANING

.1 Clean work area at the end of each day.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.3 Leave work areas clean, free from grease, finger marks and stains.

3.4 SCHEDULE

.1 Provide flashings to match existing and as required to ensure continuity of building's vapor and air barrier.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.13-[M87], Sealing Compound, One-component, Elastomeric, Chemical Curing.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1168-[A2005], Adhesives and Sealants Applications.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Manufacturer's product to describe:

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit electronic copies of WHMIS MSDS.

.3 Samples:

.1 If requested, submit samples of each type of material and colour.

.2 Cured samples of exposed sealants for each colour where required to match adjacent material.

.4 Manufacturer's Instructions:

.1 Submit instructions to include installation instructions for each product used.

1.3 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00- Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions. Protect from freezing, moisture and water.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address, with manufacturer's seals and labels intact.

.3 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect joint sealants from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

1.5 SITE CONDITIONS

.1 Ambient Conditions:

.1 Proceed with installation of joint sealants only when:

.1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer.

.2 Joint substrates are dry.

.3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.2 Joint-Width Conditions:

.1 Proceed with installation of joint sealants only where joint widths are within the range of applicable use as determined by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Health Canada.

Part 2 Products

2.1 SEALANT MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

.3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Silicones one part: to CAN/CGSB-19.13.

2.3 SEALANT SELECTION

.1 For glazing and flashing: Silicone

.1 High resistance to weather, UV, and temperature extremes

.2 One-part, medium-modulus neutral-cure adhesive/sealant silicone material

.3 Accepted product: Dow Corning 795, or approved equal

2.4 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.

.2 Primer: in accordance with sealant manufacturer's written recommendations.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate.

.2 Inform Departmental Representative 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 Departmental Representative.

3.2 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Report to Departmental Representative all cases where joint conditions prevent sealant installation in accordance with contract documents, before proceeding.

.3 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.4 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.5 Ensure joint surfaces are dry and frost free.

.6 Verify that specified environment conditions are ensured before commencing work.

.7 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required by manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

.1 Sealant:

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing:

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

3.7 CLEANING

.1 Progress Cleaning:

.1 Leave Work area clean at end of each day.

.2 Clean adjacent surfaces immediately.

.3 Remove excess and droppings, using recommended cleaners as work progresses.

.4 Remove masking tape after initial set of sealant.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.8 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by joint sealants installation.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 07 62 00 - Sheet Metal Flashing and Trim.

.2 Section 07 92 00 - Joint Sealing

1.2 REFERENCE STANDARDS

.1 Aluminum Association (AA)

.1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.

.2 ASTM International

.1 ASTM B209-07, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.2 ASTM B221-08, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.3 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.

.4 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.

.5 ASTM E331-00(2009), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.6 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.

.7 ASTM D2240-05, Standard Test Method for Rubber Property - Durometer Hardness.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 1.108-M89, Bituminous Solvent Type Paint.

.2 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.

.3 CAN/CGSB-12.8-97, Insulating Glass Units.

.4 CAN/CGSB-12.8-97 (Amendment), Insulating Glass Units.

.5 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.

.6 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.

.4 CSA International

.1 CAN/CSA-S157/S157.1-05, Strength Design in Aluminum/Commentary on CAN/CSA-S157, Strength Design in Aluminum.

.2 CSA W59.2-M1991(R2008), Welded Aluminum Construction.

.5 Environmental Choice Program (ECP)

.1 CCD-045-95(R2005), Sealants and Caulking Compounds.

.6 Glass Association of North American (GANA)

.1 GANA Glazing Manual - 2008.

.2 GANA Laminated Glazing Reference Manual - 2009.

.7 National Research Council Canada (NRC)

.1 National Building Code of Canada 2015 (NBC).

1.3 ADMINISTRATIVE REQUIREMENTS

.1 If requested, arrange for site visit with Departmental Representative prior to start of Work to examine existing site conditions adjacent to demolition Work.

1.4 PRE-INSTALLATION MEETING

.1 If requested, convene a pre-installation meeting at Project site minimum two weeks before commencing work of this Section.

.2 Include parties directly affecting work of this Section, including, sloped glazing manufacturers technical representative, installer’s job foreman.

.1 Review sloped glazing system drawings, specifications, and other contract documents affecting work.

.2 Review submittals, completed and yet to be completed.

.3 Review materials, shop and site fabrication, and installation requirements.

.4 Review required inspections, operational testing, and certifying procedures.

.5 Review and finalizing of construction schedule related to other work affecting sloped glazing installation and verification of availability of materials, installer's personnel, equipment, and facilities required to make progress and avoid delays.

.6 Review preparation and installation procedures and coordination and scheduling required with related work.

.7 Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions.

.8 Tour, inspect, and discuss conditions, connections to building structure, and other preparatory work performed by other installers.

.9 Record and submit copies of minutes including discussions, decisions, agreements, and disagreements to each party attending and concerned parties not in attendance.

1.5 SUBMITTALS FOR REVIEW

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer’s instruction, printed product literature and data sheets for glass, sealants, and glazing accessories. Provide component dimensions, describe components within assembly, anchorage and fasteners, glass, finish coating, internal drainage details, water flow drainage diagrams, and performance criteria.

.3 Shop Drawings: Include plans, elevations, sections, full-size details, and attachments to adjoining work. Indicate the following:

.1 Design parameters, material ordering, fabrication, and erection, assemblies, materials, finishes, methods of joining and anchoring, types of sealants, gaskets, insulation, infill panels, thermal breaks, provision for expansion and contraction, drainage, pressure equalization compartments, and adjacent construction, and:

.2 Dimension limits of movements for moving joints and provisions for expansion and contraction.

.3 Show relative layout of adjacent assemblies including existing skylight framing, beams and slabs with dimensions noted.

.4 Perimeter sealant joint sizes, including tolerances and minimum/maximum joint sizes required.

.5 Detailed requirements for insulation materials, air/vapor barriers and their installation.

.6 Clear designation showing the path of water drainage from the system.

.7 Installation instructions for the project.

.8 Joinery details.

.9 Glass thermal and wind load stress analysis documenting adequate glass thickness and/or heat treatment to meet stresses generated. Thermal stress analysis to include effects of exterior and interior shading, conduction at glass edge, and contribution of low-e coatings.

.10 Spacers and Setting Blocks: Data indicating compliance with requirements for resistance to sunlight, weathering, oxidation and permanent deformation under load.

.11 Prepare Shop Drawings under direct supervision of a professional engineer.

.1 Include framing member structural and physical characteristics, calculations, dimensional limitations.

.2 Each shop drawing to bear seal and signature of the professional engineer registered in British Columbia, Canada.

.4 Samples.

.1 If requested, submit two samples 300 x 300 mm in size illustrating prefinished aluminum surface, specified glass, glazing materials illustrating edge and corner.

1.6 SUBMITTALS FOR INFORMATION

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Qualifications Data: For manufacturer, professional engineer, and Installer.

.3 Installation Data: Special installation requirements.

.4 Product Test Reports:

.1 For sloped glazing, substantiating engineering data, test results of previous tests by independent laboratories which purport to meet performance criteria and other supportive data.

.5 Source quality control reports.

.6 Field quality control reports.

.7 Sealant Manufacturer's Certificates.

.8 Certification from Glass and Gasket Manufacturer: Include statement certifying that glass and glazing materials and requirements indicated on Shop Drawings have been reviewed and approved for use relative to their specific applications, dimensional design and profile parameters, compatibility with adjacent materials, and conformance with Contract Documents. Include relevant drawing numbers, dates, and revision numbers.

1.7 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 – Closeout Submittals.

.2 Maintenance Data: For sloped glazing, to include in maintenance manuals. Include instructions for re-glazing.

1.8 QUALITY ASSURANCE

.1 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience, and employing a professional engineer.

.2 Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience, approved by manufacturer.

.3 Professional Engineer's Qualifications: Structural engineer experienced in design and installation of the specified sloped glazing systems, and licensed in the Province where the Project is located.

1.9 DELIVERY, STORAGE, AND PROTECTION

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Protect prefinished aluminum surfaces with wrapping or strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather. Puncture wrappings at ends for ventilation.

.3 Protect glass with a protective film.

.4 Replace defective or damaged materials with new.

1.10 ENVIRONMENTAL REQUIREMENTS

.1 Do not install sealants when ambient temperature, and surface temperature of the area to receive the sealant is outside the sealant manufacturer's acceptable range.

.2 Maintain acceptable temperature range during and after installation of sealants until cured.

1.11 WARRANTY

.1 Correct defective Work within a five-year period after Substantial Performance of the Work.

.2 Manufacturer's Assembly Warranty: Provide a ten-year warranty to include coverage for complete system for failure to meet specified requirements or that fail in materials or workmanship, including:

.1 Structural failures including, but not limited to, excessive deflection.

.2 Noise or vibration created by wind and thermal and structural movements.

.3 Deterioration of metals, metal finishes and other materials beyond normal weathering.

.4 Water penetration through fixed glazing and framing areas.

.5 Failure of operating components.

.3 Insulating Glass Unit Warranty: Provide ten-year manufacturer warranty for glazed units.

Part 2 Products

2.1 PERFORMANCE REQUIREMENTS

.1 Ensure continuity of building enclosure vapour and air barrier throughout assembly.

.2 Structural:

.1 Existing Framing: Existing aluminum framing and mullions to remain. Contractor shall examine existing conditions and advise Departmental Representative in writing if any unsuitable conditions exist to prevent the existing framing for re-use with new glazing system. Provide written documentation of any component that is not fit for service. Investigate existing system and confirm that it will perform as required by the performance requirements of this specification, including but not limited to:

.1 Plumbness and trueness

.2 Deflection

.3 Structural design loading

.4 System assembly movement

.5 Energy performance

.6 Building envelope continuity

.2 System Design: Design and size components, including glass, to withstand dead loads and live loads caused by positive and negative wind and snow loads acting normal to plane of sloped glazing, as calculated in accordance with applicable code, as measured in accordance with ASTM E330.

.3 Effects of Combinations of Loads: Design new components and verify overall system to withstand the most unfavorable combinations of loads.

.4 Deflection:

.1 Deflection: Verify structural performance of existing aluminum components of sloped glazing in accordance with CSA S157/S157.1.

.2 Deflection Normal to Plane of Sloped Glazing: Verify existing framing deflection to L/175, with full recovery of glazing materials.

.3 Deflection Parallel to Glazing Plane: L/360 of clear span or 3 mm, whichever is smaller.

.4 Reduce deflection values when performance of structural glazing or water tightness will be compromised, or when detrimental effect to system components will occur.

.5 Verify existing framing is straight and true with alignment survey.

.5 System Assembly Movement: Accommodate without damage to system, components or deterioration of seals, movement within system, movement between system and perimeter framing components, dynamic loading and release of loads, deflection of structural support framing, tolerance of supporting components, column shortening, long-term creep of structural members, interstorey drift, and deflection from uniformly distributed and concentrated live loads.

.6 Joint Movement Capability between System and Adjacent Construction: Design expansion joints with movement capability as required, but not less than plus or minus 50 percent of joint width, without detrimental effects to assembly and adjacent construction.

.7 Energy Performance:

.1 Thermal Transmittance (U-factor): Provide U-factor for fixed glazing and framing areas (overall area) based on largest areas of glass as calculated in accordance with referenced standards, but not more than 1.42 W/sq. m x K; 1.13 W/sq. m x K preferred.

.2 Condensation Resistance: No condensation shall occur on interior framing member surfaces before the exposed glass area of insulating glass units reaches the dew point temperature, under local design environmental conditions. Thermally, the grid members shall have a resistance to heat transfer equal to or better than that of the area along the bottom of the insulating glass units.

.1 Condensation if apparent at design conditions shall not extend beyond a zone defined by lower 25 mm of bottom edge of insulating glass units.

.2 No condensation shall occur on the aluminum framing.

.3 Environmental Design Conditions: Design sloped glazing assemblies using the design winter and summer interior and exterior conditions for Summerland, British Columbia.

.4 Verify performance of frames so that edges of inner pane of insulating glass units do not fall more than 8 deg. C below the temperature of the center of the inner pane.

.3 Expansion / Contraction: Verify that existing system provides for expansion and contraction within system components caused by a cycling exterior temperature range of minus 35 deg. C to 60 deg. C, and building interior temperature range of 10 deg.C to 29 deg. C over a 12-hour period without causing detrimental effect to system components. Facing panels to remain flat under these conditions.

.4 Glazing and Framing Performance:

.1 Simulate glazing performance using WINDOW by Lawrence Berkley Laboratories (LBL).

.2 Calculate overall thermal performance using weighted area methods in accordance with CSA A440.2.

.3 Base acceptable condensation resistance as demonstrated by simulation on a minimum temperature 3 deg. C greater than the calculated dew

point temperature based on interior design condition of 21 deg. C at 25 percent relative humidity.

.4 Alternately, base test results on AAMA 1503.1 to verify performance.

.8 Air Infiltration and Exfiltration:

.1 Limit air infiltration and exfiltration through sloped glazing area including interface with adjacent construction to maximum 0.15 L/sec/sq. m at a 300 Pa static pressure difference when measured in accordance with ASTM E283.

.9 Water, Vapor and Moisture

.1 Provide for positive drainage of water entering sloped glazing assemblies, to exterior face of building in accordance with Rain Screen Principle (NRC).

.2 Comply with requirements of the Rainscreen Principle (NRC):

.1 Demonstrating pressure-equalization and compartmentalization of the drainage path.

.2 Compartmentalization seals to be air and water tight, capable of supporting design air pressure differences.

.3 Two stage weather tightening with a vented/weeped outer layer and a sheltered inboard air/vapor barrier primary layer.

.4 Provide drainage path to exterior face of assembly for water entering at joints and condensation occurring within the building envelope assembly.

.5 Design system to provide resistance to water entry at a pressure difference of 600 Pa when tested in accordance with ASTM E331.

.6 Include provisions for collecting and re-evaporating condensate arising from extreme conditions.

.7 Installed assembly to remain watertight under the interior and exterior design conditions in combination with movements occurring due to imposed loads.

.8 Provide an air barrier and vapor barrier in same plane in the building envelope design, unless otherwise indicated.

.10 Not Permitted: 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.

.11 Provisions for Movement of System: Unless otherwise indicated, verify the following.

.1 Horizontal Differential Racking Movement: 25 mm.

.2 Vertical Differential Movement: 13 mm.

.12 Service Life: Comply with recommendations of CSA S478.

.1 Sloped Glazing Framing System, Connections and Anchors: Designed to a minimum service life of 60 years.

.2 Removable components with a service life of less than 60 years shall have a minimum service life of 30 years.

.3 Design the components that are intended to be replaced within the service life of the system, for easy removal and replacement.

2.2 MATERIALS

.1 Extruded Aluminum: ASTM B221/B221M.

.2 Sheet Aluminum: ASTM B209/B209M.

.3 Fasteners: Stainless steel.

2.3 SLOPED GLAZING ASSEMBLY

.1 Existing Framing: Existing aluminum framing and mullions to be verified against performance criteria of this specification. Provide written documentation of any component that is not fit for service. Replacement components to be designed in accordance with performance criteria and subsequent requirements.

.2 Description: Existing self-supporting thermally broken aluminum framing, factory-fabricated and prefinished, site-assembled, vision glass, dual pane, argon-filled units with Low-E coating; related flashings, anchorage and attachment devices.

.3 Sloped Glazing Framing:

.1 Profile: to match existing, or as required to meet performance criteria.

.2 Framing: Thermally-broken with interior section insulated from exterior attachments. Exterior framing cap.

.3 Glazing Stops and Pressure Plates: Of sufficient size and strength to provide adequate bite on glass; aluminum pressure plate.

.4 Glazing Method: Retained mechanically with gaskets on four sides with aluminum pressure plate

.5 Drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system.

.6 Framing Caps: Aluminum, finish to match sloped glazing framing sections, secured with concealed fastening method.

.4 Reinforced Framing, if required: Same profile and dimensions as unreinforced framing with internal reinforcement of shaped steel structural section.

.5 Air Barrier Flashings: Materials as required to tie new glazing system into existing construction.

.6 Low-Expansion Detailing Foam Insulation: Materials as required to tie new glazing system into existing construction.

2.4 GLASS AND GLAZING MATERIALS

.1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.

.2 Design glass and glazing in accordance with performance requirements of this specification, and with glass thicknesses not less than 6 mm.

.3 Flat Glass:

.1 Safety glass: to CAN/CGSB-12.1,

.1 Type 2 - Tempered

.2 Class B - Float

.3 Category 2.

.4 Glass Thickness: To meet performance criteria, and not less than 6 mm.

.5 Edge treatment for exposed edges: ground and polished.

.6 Edge profile for exposed edges: square with chamfer edges.

.4 Insulating Glass Units:

.1 Insulating glass units: to CAN/CGSB-12.8, double unit

.1 Glass: to CAN/CGSB-12.1

.2 Glass thickness: To meet performance criteria, and not less than 6 mm. Overall IGU thickness to not exceed thickness allowed by existing framing.

.3 Inter-cavity space thickness: as required above.

.4 Glass coating: Low emissive sputter vapor deposition coating on No. 2 surface. Provide units by single manufacturer and of same color rendition between glass units.

.1 Edge delete coated glass in contact with spacers to ensure maximum spacer to glass seal.

.5 Inert gas fill: 90% argon, 10% air, for all units.

.2 Sealed units shall be certified by Glass Association of North America (GANA).

.5 Glazing Materials: Type to suit application to achieve weather, moisture, and air infiltration requirements, and as follows:

.1 Shims: Pressure sensitive resilient extruded heat cured silicone rubber, and as recommended by the insulating glass unit manufacturer.

.2 Spacers (Edge Blocks) and Setting Blocks: 50 and 80 Durometer A hardness plus/minus 5 respectively, silicone rubber; designed to resist sunlight, weathering, oxidation and permanent deformation under load.

.3 Glazing Tape: Macro-polyisobutylene preformed glazing tape, compatible with silicone sealant.

.4 Continuous Exterior Glazing Gaskets:

.1 Glazing gasket to be sized to provide adequate compression to the glass edges and glazing tape to ensure a tight seal to meet performance requirements.

2.5 SEALANTS MATERIALS

.1 Sealants: As specified in Section 07 92 00 – Joint Sealing.

.2 Sealant Used within System (Not Used for Glazing): Type as recommended by sloped glazing manufacturer, and with VOC content less than 100 g/L.

2.6 AUXILIARY MATERIALS

.1 Flashings and Trim:

.1 General: Fabricate in accordance with Section 07 62 00 - Sheet Metal Flashing and Trim.

.2 Brake-Formed Flashings and Trim: Provide brake-formed flashings as required.

2.7 FABRICATION

.1 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

.2 Assembled systems to permit re-glazing of individual glass units without requiring removal of sloped glazing framing.

.3 New or replaced sloped glazing assembly components to be fabricated square and true, free from distortion, waves, twists, and buckles.

.1 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof. Machine cut joints; miter corners. Use plated screws or back weld; seal with non-hardening sealant.

.1 Accurately shape framing and cover cap intersections with minimal width hairline joints, sufficient to permit thermal movements.

.2 Prepare components to receive anchor devices. Install anchors.

.3 Arrange fasteners and attachments to ensure concealment from view. Drill and notch members to drain without permitting air infiltration.

.4 Reinforce concealed framing members as required for external imposed loads with loads transferred directly to structure.

.4 Provide flexible, continuous gasket air/vapor barrier seals within framing assemblies, for attaching air/vapor transition strips to adjoining construction.

.5 Fabricate and install glass and glazing materials with appropriate glazing method to achieve performance requirements.

.6 Facings and Closures: Provide facings, closure pieces to complete the assembly as required to seal against weather and to provide finished appearance; minimum 2 mm thick extruded aluminum; same finish as adjoining sloped glazing framing.

.7 Flashings and Trim: Fabricate in accordance with Section 07 62 00 - Sheet Metal Flashing and Trim.

.1 Provide brake-formed flashings as required.

.8 Ensure framing and connections accommodate structure and sloped glazing framing deflection.

.9 Isolate aluminum from dissimilar metals, other than stainless steel, with rubber isolation pads. Bituminous paint not permitted.

2.8 FINISHES

.1 Exposed Aluminum Surfaces of Mullions or Framing: To match existing.

.2 Exterior Exposed Aluminum Surfaces of Framing Caps: To match existing.

.3 Concealed Aluminum Surfaces: To match existing.

.4 Concealed Steel Items: Galvanized in accordance with ASTM A123, 610 g/sq. m.

.5 Touch-Up Primer for Galvanized Steel Surfaces: SPCC Paint 20 zinc rich.

Part 3 Execution

3.1 EXAMINATION

.1 Examine existing aluminum framing and mullions and verify against performance criteria in Section 2 of this specification. Provide written documentation of any component that is not fit for service.

.2 Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

.3 Verify dimensions, tolerances and method of attachment with other work.

.4 Verify openings and adjoining air and vapor barrier materials are ready to receive the work of this section.

.5 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SYSTEM INSTALLATION

.1 Install sloped glazing system in accordance with manufacturer instructions and the reviewed shop drawings

.2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

.3 If replacing existing framing members, provide alignment attachments and shims to permanently fasten system to building structure. Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.

.4 Align assemblies plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.

.5 Conceal fasteners except where unavoidable for structural anchorage.

.6 Provide thermal isolation where components penetrate or disrupt building insulation. Install gap-filling spray foam insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.7 Trim: Install flashings and other trim. Brake trim to shape as required; accurately cut and fit with hairline joints.

.8 Coordinate attachment and seal of perimeter air barrier materials. Ensure integrity of and lap and seal. Provide solid backing at self-adhered membrane connections.

.9 Install perimeter sealant as required to achieve performance criteria.

.10 Metal Protection:

.1 Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer, applying sealant or tape, or installing nonconductive spacers as recommended by manufacturer for this purpose.

.2 Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

3.3 GLAZING INSTALLATION: EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)

.1 Perform work in accordance with GANA Laminated Glazing Reference Manual and GANA Glazing Manual for glazing installation methods.

.2 Cut glazing tape to length and set against permanent stops, 6mm below sight line. Seal corners by butting tape and dabbing with sealant.

.3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.

.4 Place setting blocks at ¼ points, with edge block maximum 150mm from corners.

.5 Rest glazing on setting blocks and push against tape with sufficient pressure to attain full contact at perimeter of light or glass unit.

.6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line. Place glazing tape on glazing light or unit with tape 16mm below sight line.

.7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9mm below sight line.

.8 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.4 ERECTION TOLERANCES

.1 Maximum Variation from Plumb 1.5 mm/m or 12 mm/30 m, whichever is less.

.2 Maximum Misalignment of Two Adjoining Members Abutting in Plane: 0.8 mm.

.3 Maximum sealant space between sloped glazing and adjacent construction: 13 mm.

.4 Location: Limit variation from plane to 3 mm in 3.5 m; 2 mm over total length.

.5 Joint Width Between Components: Maximum 1.5 mm; each joint of uniform width.

.6 Racking on Face: Plus/minus 6 mm.

.7 Tolerances shall not be cumulative.

3.5 FIELD QUALITY CONTROL – CONSTRUCTION INSPECTION

.1 Testing Agency Services: Contractor shall engage an independent qualified inspection company to perform inspections during installation of sloped glazing assemblies, including:

.1 Verification of vapor retarder, and air barrier installation.

.2 Checks of interfaces and termination seals with other elements.

.3 Review of panel to panel air seals, review of roof/wall interface.

.4 Review of panel fastening, exterior sealants and similar items.

.5 Checks of air and vapor seals/barriers for continuity, penetrations and correct orientation.

.6 Checks for continuity of insulation plane.

.7 Verification of flashing placement and continuity.

3.6 FIELD QUALITY CONTROL – TESTING

.1 Testing Agency Services: Contractor shall engage an independent qualified testing agency to perform tests and inspections.

.2 Water Spray Test: Before installation of interior finishes has begun, Departmental Representative will designate two areas to be tested according to AAMA 501.2 and shall not display evidence water penetration.

.1 Test Area: Representative areas of sloped glazing assemblies including tie-ins to adjacent assemblies. Possible locations include areas of intersection between 4 glazing units, or the upper corner of the glazing replacement where it ties into the adjacent construction.

.2 Perform tests in each test area as directed by Departmental Representative. Perform at least three tests at each location, as required, prior to 10, 35, and 70 percent completion.

.3 Tests: Static air infiltration and static water penetration, to the same performance requirements indicated, except to ASTM 501.2 and ASTM E783 test requirements.

.4 Thermographic Inspection: An infrared scan of the building envelope at the completion of the envelope construction, identifying thermal anomalies to be investigated.

.3 Make adjustments necessary to comply with performance requirements, acceptable to Departmental Representative.

.4 Sloped glazing assemblies will be considered defective if they do not pass tests and inspections. Make necessary acceptable adjustments to achieve compliance with requirements.

.5 Do not proceed with tests in succeeding locations until work complies with specified requirements.

3.7 CLEANING

.1 Remove protective material from prefinished aluminum and glass surfaces.

.2 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

.3 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

3.8 PROTECTION OF FINISHED WORK

.1 Protect installed products and components from damage during construction.

.2 Protect adjacent construction and existing conditions from damage during construction.

.3 Repair damage to adjacent materials caused by glazing installation.

END OF SECTION