# EXTERIOR WALL REPAIRS

**AT**

## BUILDING 55
## CENTRAL EXPERIMENTAL FARM
**PRINCE OF WALES DRIVE, OTTAWA, ONTARIO**

**PREPARED FOR**

**CORPORATE MANAGEMENT BRANCH, CEF INTEGRATED SERVICES**
**AGRICULTURE AND AGRI-FOOD CANADA**
**K.W. NEATBY BUILDING**
**960 CARLING AVENUE, Rm. 1121**

**PREPARED BY**

**CLELAND JARDINE ENGINEERING LIMITED**
**580 TERRY FOX DRIVE, SUITE 200**
**KANATA, ONTARIO**
**K2L 4B9**

**CJEL Ref. No. 15-1320**
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**1 Minimum Standards**

.1 Materials shall be new and work shall conform to the minimum applicable standards of the Canadian General Standards Board, the Canadian Standards Association, the National Building Code of Canada 2015 (NBC) and all applicable Provincial and Municipal codes. In the case of conflict or discrepancy the most stringent requirement shall apply.

.2 Note: All membranes, roofing, wall framing and cladding elements are to be installed in strict conformance with Manufacturer's installation instructions as well as the latest edition of the Ontario Building Code, Roofer's Guide, and the Canadian Mortgage and Housing Association's Canadian Wood Frame Housing Guide. All built-up component materials are to be provided by the same Manufacturer, as per the specifications.

**2 Description Of Work**

.1 Mobilization:

.1 Provide all necessary personnel and equipment to provide access to the area of work, including all necessary safety equipment and protection of property at the roof level, ground level and at the building interior (i.e. provide and maintain separation to portions of the building not included in the scope of work). Provide full-height construction fencing around perimeter of site, covered with green construction mesh.

.2 Provide all necessary supplementary shoring elements during the project to perform the work. Provide a copy of all shoring drawings stamped by an engineer licenced in the Province of Ontario for review and approval prior to installing supplementary shoring.

.2 Demolition:

.1 Carefully remove the existing windows from the 1st and 2nd level in the area of work and store on site for repair and reinstallation.

.2 At the limits shown on the project drawings, remove and dispose of all noted cladding and structural elements down to clean base structure. This includes all mansard sheet metal roofing to the underside of the curb of the

roof, and all stucco cladding, lath, sheathing boards and remaining wall finishes down to the concrete footing.

.3 Provide removal of all designated substances encountered during demolition, maintaining applicable health and safety standards as per Section 01 35 30. Note the designated substance report attached to this specification for areas requiring remediation. Inspect the site and submit a remediation plan and scope of work to Departmental Representative for review and approval prior to beginning demolition operations.

.3 New Structural Elements

.1 Supply and install new structural elements as shown on the project drawings, including new steel framing, stud/rafter infill, and connections to existing structural elements including new reinforced concrete footings and piers.

.4 New Cladding Elements

.1 New Exterior Insulation and Finish System (EIFS) Cladding: Supply and install new built up EIFS cladding system including new stud wall, sheathing, insulation, air barriers, vapour barriers, finishing system and sealants. Include for reinstallation of restored wood framed windows. Complete the work as shown on the project drawings, described in the specifications, and as per the EIFS system manufacturer's installation instructions.

.2 Sheet Metal Roofing System: Supply and install prefinished galvanized sheet metal roofing with provision for furring to create a vented cross section at the mansard and dormers. Include for new soffits, fascia, flashings and the reinstallation of restored wood framed windows. Complete the work as shown on the project drawings, described in the specifications and as per the roofing manufacturer's installation instructions.

.5 Remove, Restore and Reinstate Existing Windows

.1 Salvage the existing single-hung wood framed window for re-use at both the mansard and stucco windows Inspect the existing windows and frames in conjunctio

with the Departmental Representative. Where wood rot is observed, remove and restore components including stops, rails, jambs, head, sill and counter-weight components with new painted pine to match remaining components. Provide new built-up sills, headers and jambs as required to install new windows. Where wood components including casings and interior finishes will be exposed, use painted pine as per Section 06 10 10 – Carpentry.

.6 Project Completion

.1 Clean all interior and exterior surfaces affected by the work to the satisfaction of the Departmental Representative.

.2 Remove all debris and deleterious materials from all areas accessed by the Contractor during construction activities.

.3 Make good all damaged landscaping including new topsoil and grass seed where affected by construction activities.

**3 Taxes**

.1 Pay all taxes properly levied by law (including Federal, Provincial and Municipal).

**4 Fees, Permits, and Certificates**

.1 Pay all fees and obtain all permits. Provide authorities with plans and information for acceptance certificates. Provide inspection certificates as evidence that work conforms to requirements of Authority having jurisdiction.

**5 Fire Safety Requirements**

.1 Comply with the National Building Code of Canada 201 (NBC) for fire safety in construction and the National Fire Code of Canada 2010 (NFC) for fire prevention, fire fighting and life safety in building in use.

.2 Comply with Human Resources Development Canada (HRDC), Fire Commissioner of Canada (FCC) standards:

.1 No. 301: Standard for Construction Operations
.2 No. 302: Standard for Welding and Cutting
.3 No. 374: Fire Protection Standard for General Storage (Indoor and Outdoor) available from Fire Protection Engineering Services, Labour Program,

HRDC or following internet site: http://info.load-otea.hrdcdrhc.gc.ca/fire_prevention/standards/commissioner.shtml

.4 Retain all fire safety documents and standards on site.

.3 Welding, cutting:

.1 At least 48 hours prior to commencing cutting, welding or soldering procedure, provide to Departmental Representative:

.1 Notice of intent, indicating devices affected, time and duration of isolation or bypass.

.2 Completed welding permit as defined in FC 302.

.3 Return welding permit to Departmental Representative immediately upon completion of procedures for which permit was issued.

.2 A fire watcher as described in FC 302 shall be assigned when welding or cutting operations are carried out in areas where combustible materials within 10m may be ignited by conduction or radiation.

**6 Field Quality Control**

.1 Carry out Work using qualified licenced workers or apprentices in accordance with Provincial Act respecting manpower vocational training and qualification.

.2 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licenced workers.

.3 Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.

**7 Hazardous Materials**

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

**8 Removed Materials**

.1 Unless otherwise specified, materials for removal become the Contractor's property and shall be taken from site.

**9 Protection**

.1 Protect finished work against damage until take-over.

.2 Protect adjacent work against the spread of dust and dirt beyond the work areas.

.3 Protect operatives and other users of site from all hazards.

**10 Use of Site and Facilities**

.1 Execute work with least possible interference or disturbance to the normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.

.2 Maintain existing services to building and provide for personnel and vehicle access.

.3 Where security is reduced by work provide temporary means to maintain security.

.4 Closures: Protect work temporarily until permanent enclosures are completed.

**11 Site Storage**

.1 The Departmental Representative will assign storage space which shall be equipped and maintained by the Contractor.

.2 Do not unreasonably encumber site with materials or equipment.

.3 Move stored products or equipment which interfere with operations of Departmental Representative or other contractors.

.4 Obtain and pay for use of additional storage or work areas needed for operations.

**12 Cut, Patch and Make Good**

.1 Cut existing surfaces as required to accommodate new work.

.2 Remove all items as shown or specified.

.3 Patch and make good surfaces cut, damaged or disturbed, to Departmental Representative's approval. Match existing material, colour, finish and texture.

**13 Examination**

.1 Examine site and conditions likely to affect work and be familiar and conversant with existing conditions.

**14 Signs**

.1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices, etcetera, in both official languages or by the use of commonly-understood graphic symbols to the Departmental Representative's approval.

.2 No advertising will be permitted on this project.

**15 Access and Egress**

.1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

**16 Scaffolds and Work Platforms**

.1 Design, install, and inspect scaffolds and work platforms required for work in accordance with relevant municipal, provincial and other regulations.

.2 Provide design drawings, signed and sealed by qualified Professional Engineer licensed in the province of Ontario, where prescribed.

.3 Additions or modifications to scaffolding must be approved by Professional Engineer in writing.

**17 Public Way Protection**

.1 Design, erect and maintain hoarding and covered pedestrian walkways to support all loads including windloads and provide protection, complete with signs and electrical lighting as required by authority having jurisdiction.

**18 Waste Management**

.1 Comply with the Environmental Protection Act, Ontario Regulations O.Reg. 102/94 and O. Reg. 103/94 for waste management program on construction and demolition projects.

.2 Conduct "waste audit" to determine waste generated during demolition or construction operations, prepare written "waste reduction work plan" and implement procedures to reduce, reuse and recycle materials to the extent possible.

.3 Provide a "source separation program" to disassemble and collect in an orderly fashion the following "materials designated for alternative disposal" from the "general waste" stream.

.1 brick and Portland cement concrete.
.2 cardboard (corrugated).
.3 gypsum board (unfinished).
.4 steel.
.5 wood (not including treated or laminated wood).

.4 Submit complete records of all removals from site for both "materials designated for alternative disposal" and "general waste" including:

.1 Time and date of removal
.2 Description of material and quantities.
.3 Proof that materials have been received at an Approved Waste Processing Site or certified Waste Disposal Site as required.

**19 Guarantees and Warranties**

.1 Before completion of work collect all manufacturer's guarantees and warranties and deposit with Departmental Representative.

**20 Clean Up**

.1 Clean up work area as work progresses. At the end of each work period, and more often if ordered by the Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.

.2 Upon completion remove scaffolding, temporary protection and surplus materials. Make good defects noted at this stage.

.3 Wash and polish glass, mirrors, ceramic tile, aluminum, chrome, stainless steel, baked or porcelain enamel, plastic laminate and other plastic surfaces, floors, hardware and washroom fixtures. Clean manufactured articles in accordance with manufacturer's directions.

.4 Clean areas under contract to a condition at least equal to that previously existing and to approval of Departmental Representative.

**21 Building Smoking Environment**

.1 Smoking is not permitted in the Building. Obey smoking restrictions on building property.

**22 Dust Control**

.1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of work and public.

.2 Maintain and relocate protection until such work is complete.

.3 Protect all furnishings within work area with 0.102 mm thick polyethylene film during construction. Remove film during non- construction hours and leave premises in clean, unencumbered and safe manner for normal daytime function.

**23 Testing Laboratory Services**

.1 Provide safe working areas and assist with testing procedures, including provisions for materials or services and co-ordination, as required by testing agency and as authorized by Departmental Representative.

.2 Where tests indicate non-compliance with specifications, contractor to pay for initial test and all subsequent testing of work to verify acceptability of corrected work.

**24 Scheduling**

.1 On award of contract submit bar chart construction schedule for work, indicating anticipated progress stages within time of completion. When schedule has been reviewed by the Departmental Representative, take necessary measures to complete work within scheduled time. Do not change schedule without notifying Departmental Representative.

.2 Carry out work during "regular hour" Monday to Friday from 07:00 to 18:00 hours.

**25 Cost Breakdown**

.1 Before submitting first progress claim submit breakdown of Contract Amount in detail as directed by Departmental Representative and aggregating the Contract Amount. After approval by Departmental Representative cost

breakdown will be used as the basis of progress payments

**26 Precedence** .1 Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

**END OF SECTION**

## PART 1 - GENERAL

**1.1 RELATED SECTIONS**

.1 Section 01 00 10 – General Requirements

.2 Section 01 35 30 - Health and Safety Requirements

.3 Section 06 10 10 – Rough Carpentry

.4 Section 07 24 10 – Exterior Insulation and Finish System

.5 Section 07 62 00 – Sheet Metal Flashing

**1.2 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 coordinated 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 coordinated.

.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 review.

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

**1.3 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 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 coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Allow seven (7) days for Departmental Representative's review of each submission.

.4 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.

.5 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.6 Accompany submissions with transmittal letter, in duplicate, 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.

.7 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.

.8 After Departmental Representative's review, distribute copies.

.9 Submit 3 prints of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.10 Submit 3 copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.11 Submit 3 copies of test reports for requirements requested in specification Sections and as requested by 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.

.12 Submit 3 copies of certificates for requirements requested in specification Sections and as requested by 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.

.13 Submit 3 copies of manufacturer's instructions for requirements requested in specification Sections and as requested by 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.

.14 Submit 3 copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.

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

.15 Submit 3 copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

.16 Submit 3 copies of the site-specific Health and Safety Plan for requirements requested in specification Sections and as requested by Departmental Representative.

.17 Delete information not applicable to project.

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

.19 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies 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.

.20 Review of shop drawings is for sole purpose of ascertaining conformance with general concept. This review shall not mean that the City 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 all requirements of construction and Contract Documents. 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 all sub-trades.

**1.4 SAMPLES**

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Departmental Representative's business address.

.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 Adjustments made on samples 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 samples which Departmental Representative may require, consistent with Contract Documents.

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

**1.5 CERTIFICATES & TRANSCRIPTS**

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

**END OF SECTION**

## PART 1 - GENERAL

**1.1 PRECEDENCE**

.1 Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

**1.2 RELATED SECTIONS**

.1 Section 01 33 00 - Submittal Procedures.

**1.3 REFERENCES**

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

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

.1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario

.1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. June 2002.

**1.4 SUBMITTALS**

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

.2 Submit site-specific Health and Safety Plan: Within seven (7) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation.

.3 Submit two (2) copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative.

.4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 – Submittal Procedures.

.7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within seven (7) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within seven (7) days after receipt of comments from Departmental Representative.

.8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health

and Safety.

.9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

.10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations. As well as standard procedures plans and contingencies must incorporate the following:

.1 Fall arrest / restraint and recovery of victim.

**1.5 FILING OF NOTICE**

.1 File Notice of Project with all authorities having jurisdiction prior to beginning of Work.

**1.6 SAFETY ASSESSMENT**

.1 Perform site specific safety hazard assessment related to project.

**1.7 MEETINGS**

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

**1.8 PROJECT/SITE CONDITIONS**

.1 Work at site may involve contact with designated substances as per the supplied designated substance report.

**1.9 GENERAL REQUIREMENTS**

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

**1.10 RESPONSIBILITY**

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

**1.11 COMPLIANCE**

.1 Comply with Ontario Health and Safety Act and Regulations for

**REQUIREMENTS**

Construction Projects, R.S.O.

.2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

**1.12 UNFORSEEN HAZARDS**

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

**1.13 POSTING OF DOCUMENTS**

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

**1.14 CORRECTION OF NON-COMPLIANCE**

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

**1.15 POWDER ACTUATED DEVICES**

.1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

**1.16 WORK STOPPAGE**

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

**END OF SECTION**

greenough environmental consulting

September 9, 2015 Project No. 28768

Agirculture and Agri-Food Canada
Central Experimental Farm
Building #55

**Attn: Mr. Anthony Cesare**

**Re: Bulk Sampling of Suspect Materials for Asbestos and Lead Content**
**Central Experimental Farm, Building #55, Ottawa, Ontario**

## 1.0 INTRODUCTION

Greenough Environmental Consulting Inc. (GEC) was commissioned by Agriculture and Agri-Food Canada (AAFC), hereinafter referred to as the "Client", under the direction of Mr. Anthony Cesare, to collect and analyze suspect building materials for asbestos and lead content as directed by AAFC. The samples were collected from specified areas of the interior and exterior of building #55 at the Central Experimental Farm located in Ottawa, Ontario.

## 2.0 SCOPE AND METHODOLOGY

The sampling was conducted to determine the presence of asbestos as well as lead within select building materials prior to their manipulation as part of an upcoming project. The sampling was completed by Mr. Michael Mask, Environmental Technician for GEC, on September 3rd, 2015.

Where permitted, visual identification of materials suspected to contain asbestos was supported by the collection and analysis of representative samples as directed by the Client. Asbestos sampling was performed by GEC in order to meet the current minimum sampling requirements of Ontario Regulation 278/05 - Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05), as amended.

In Ontario, a material is defined as an asbestos-containing material (ACM) if the material has a minimum asbestos content of 0.5% by dry weight. ACMs are divided into two categories: friable and non-friable materials. A friable ACM is a material that can be crumbled, powdered, pulverized or reduced to dust by hand or moderate pressure. Friable materials can readily release fibres when disturbed. Common applications of friable ACMs are sprayed or trowelled surfacing materials (e.g. sprayed fireproofing and textured coatings) as well as mechanical and thermal insulations. Non-friable materials will generally release fibres only when cut, broken or have deteriorated to the point where the binding agents of the material begin to fail. Common non-friable ACMs include drywall joint compound, plaster, textile products (gaskets etc.) and asbestos cement (transite). It must be noted that some materials, although non-friable intact, become friable upon manipulation (i.e. plaster, ceiling tile etc.).

A total of eighteen (18) bulk samples of suspected ACMs were collected by GEC during the site investigation. Bulk samples were analyzed for asbestos content on a RUSH basis at Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario. The bulk asbestos samples were analyzed using a combination of dispersion staining and Polarised Light Microscopy (PLM). This analytical method complies with the United States Environmental Protection Agency (U.S. EPA) Method 600/R-93/116 dated July, 1993. Paracel is certified under the National Institute of Science and Technology's National Voluntary Laboratory Accreditation Program (NVLAP) to perform asbestos bulk sample analysis (NVLAP No. 200812-0). The laboratory utilizes a "positive-stop" analysis methodology and stops analysis for the particular set of samples once asbestos concentrations at or above 0.5% is detected. Therefore, samples taken in order to satisfy the requirements of O. Reg. 278/05, were not analyzed if the previous sample was identified as asbestos-containing. **Appendix 1** presents asbestos analytical results obtained for the purpose of this investigation.

For the purpose of this sampling, GEC collected one (1) paint chip sample of predominant interior paint finish and submitted the sample to Paracel Laboratories for analysis on a RUSH basis.

Paracel has received its Certificate of Laboratory Proficiency from the Canadian Association of Environmental Analytical Laboratories (CAEAL) and has achieved accreditation from the Standard Council of Canada.

Analysis of paint chip samples is performed using MOE E3470 (which utilizes EPA Method 6020) which describes the multi-elemental determination of analyses by ICP-OES in environmental samples. The method measures ions produced by a radio-frequency inductively coupled plasma. Analyte species originating in a liquid are nebulized and the resulting aerosol is transported by argon gas into the plasma torch. The ions produced by high temperatures are entrained in the plasma gas and introduced, by means of an interface, into a mass spectrometer. The ions produced in the plasma are sorted according to their mass-to-charge ratios and quantified with a channel electron multiplier. Interferences must be assessed and valid corrections applied, or the data flagged to indicate problems. Interference correction must include compensation for background ions contributed by the plasma gas, reagents, and constituents of the sample matrix. Prior to analysis, samples which require total values must be acid digested using appropriate sample preparation methods.

Inductively coupled plasma-optical emission spectrometry (ICP/OES) is applicable to the determination of sub-ug/L concentrations of a large number of elements in water samples and in waste extracts or digests. When dissolved constituents are required, samples must be filtered and acid-preserved prior to analysis. No digestion is required prior to analysis for dissolved elements in water samples. Acid digestion prior to filtration and analysis is required for groundwater, aqueous samples, industrial wastes, soils, sludges, sediments, and other solid wastes for which total (acid-leachable) elements are required. **Appendix 2** presents the lead analytical results.

## 3.0 FINDINGS

As indicated in the attached laboratory certificate, bulk sampling results for asbestos are as follows:

- Five (5) samples (SA-01A/B/C/D/E) of exterior plaster with stone inclusions were collected from building #55 and submitted for laboratory analysis. Based on the laboratory analysis, SA-01A was found to contain **1% Chrysotile asbestos**.
- Five (5) samples (SA-02A/B/C/D/E) of wall and ceiling plaster were collected from room 312 on the 3rd floor as well as room 214 on the 2nd floor of building #55 and submitted for laboratory analysis. As the particular style of plaster collected consists of a grey “base” layer and white “surface” layer, the plaster samples submitted were further broken down for a total of ten (10) samples. Based on the laboratory analysis, SA-02B (grey base layer) was found to contain **1% Chrysotile asbestos**.
    - All homogeneous plaster within the building is considered to be an asbestos-containing material.

- Three (3) samples (SA-03A/B/C) of grey/white paper insulation were collected from the 3rd floor attic space of building #55 and submitted for laboratory analysis. Based on the laboratory analysis, SA-01A was found to contain **60% Chrysotile asbestos**.

As indicated in the attached laboratory certificate, bulk sampling results for lead are as follows:

- One (1) paint sample (LS-01) of off-white paint was collected from the 3rd Floor of building #55 and submitted for laboratory analysis. Based on the laboratory analysis, no lead was identified in the sample submitted (<20µg/g).

## 4.0 RECOMMENDATIONS

Asbestos

The following recommendations are made respecting *Ontario Regulation 278/05*:

- Any asbestos-containing materials (exterior plaster with stone inclusions, interior wall/ceiling plaster or grey/white paper insulation) that will be or have the potential to be disturbed during the upcoming project should be removed in accordance with the procedures outlined in Ontario Regulation 278/05.
- Suspect materials identified during renovation and /or demolition activities not discussed in this report herein should be treated as ACMs unless proven otherwise through material specific sampling and analysis in accordance with the requirements of Ontario Regulation 278/05.

Lead

Based on the findings of the sampling program, no recommendations regarding lead are warranted at this time.

## 5.0 CLOSURE

This report has been prepared for the sole benefit of the Client and their intended use. The report may not be relied upon by any other person or entity without the express written consent of Greenough Environmental Consulting Inc. (GEC) and the Client.

Any use that a third party makes of this report, or any reliance on decisions to be made based on it, is the responsibility of such third parties. GEC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The conclusions presented represent the best judgment of the assessor based on current environmental standards and on the site conditions observed on September 3rd, 2015. Due to the nature of the investigation, limitations of this report and the limited data available, the assessor cannot warrant against undiscovered environmental liabilities. It is possible that additional, concealed designated substances may become evident during demolition activities.

We trust that this report meets your current requirements. Should you have any questions or concerns regarding the above, please do not hesitate to contact the undersigned at your convenience.

Yours Truly,

**GREENOUGH ENVIRONMENTAL CONSULTING INC.**

Michael J. Mask
Environmental Technician

Michael P. Buller, B.A. (Hons), ROHT, CRSP, CMI
Vice President of Operations

**Appendix 1**

**Analytical Results - Asbestos**

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# *Certificate of Analysis*

**Greenough Environmental Consulting Inc.**
29 Capital Drive
Ottawa, ON K2C 0E7
Attn: Mike Mask

Phone: (613) 792-4125
Fax: (613) 792-1077

Client PO:
Project: 28768
Custody: 12116

Report Date: 4-Sep-2015
Order Date: 3-Sep-2015

**Order #: 1536289**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted :

| Paracel ID | Client ID |
|---|---|
| 1536289-01 | SA-01A |
| 1536289-02 | SA-01B |
| 1536289-03 | SA-01C |
| 1536289-04 | SA-01D |
| 1536289-05 | SA-01E |
| 1536289-06 | SA-02A (Grey) |
| 1536289-07 | SA-02B (Grey) |
| 1536289-08 | SA-02C (Grey) |
| 1536289-09 | SA-02D (Grey) |
| 1536289-10 | SA-02E (Grey) |
| 1536289-11 | SA-02A (White) |
| 1536289-12 | SA-02B (White) |
| 1536289-13 | SA-02C (White) |
| 1536289-14 | SA-02D (White) |
| 1536289-15 | SA-02E (White) |
| 1536289-16 | SA-03A |
| 1536289-17 | SA-03B |
| 1536289-18 | SA-03C |

Approved By:

Emma Diaz For Heather S.H. McGregor, BSc
Laboratory Director - Microbiology

**Client:** Greenough Environmental Consulting Inc.
29 Capital Drive
Ottawa, ON K2C 0E7

**Attn:** Mike Mask
Tel: (613) 792-4125
Fax: (613) 792-1077

**Project:** 28768
**Paracel Report No.:** 1536289

**Received Date:** 03-Sep-15
**Report Date:** 04-Sep-15

## Asbestos, PLM Visual Estimation **MDL - 0.5%**

| Paracel I.D. | Sample Date | Layers Analyzed | Colour | Description | Asbestos Detected: | Material Identification | % Content |
|---|---|---|---|---|---|---|---|
| 1536289-01 | 03-Sep-15 | sample homogenized | Grey | Stucco | Yes | Client ID: SA-01A | |
| | | | | | | Chrysotile | 1 |
| | | | | | | Non-Fibers | 99 |
| 1536289-02 | 03-Sep-15 | | | | | Client ID: SA-01B | |
| | | | | | | not analyzed | |
| 1536289-03 | 03-Sep-15 | | | | | Client ID: SA-01C | |
| | | | | | | not analyzed | |
| 1536289-04 | 03-Sep-15 | | | | | Client ID: SA-01D | |
| | | | | | | not analyzed | |
| 1536289-05 | 03-Sep-15 | | | | | Client ID: SA-01E | |
| | | | | | | not analyzed | |
| 1536289-06 | 03-Sep-15 | sample homogenized | Grey | Plaster | No | Client ID: SA-02A (Grey) | |
| | | | | | | Non-Fibers | 99 |
| | | | | | | Other fibers | 1 |
| 1536289-07 | 03-Sep-15 | sample homogenized | Grey | Plaster | Yes | Client ID: SA-02B (Grey) | |
| | | | | | | Chrysotile | 1 |
| | | | | | | Non-Fibers | 99 |
| 1536289-08 | 03-Sep-15 | | | | | Client ID: SA-02C (Grey) | |
| | | | | | | not analyzed | |
| 1536289-09 | 03-Sep-15 | | | | | Client ID: SA-02D (Grey) | |
| | | | | | | not analyzed | |
| 1536289-10 | 03-Sep-15 | | | | | Client ID: SA-02E (Grey) | |
| | | | | | | not analyzed | |
| 1536289-11 | 03-Sep-15 | sample homogenized | White | Plaster | No | Client ID: SA-02A (White) | |
| | | | | | | Non-Fibers | 100 |
| 1536289-12 | 03-Sep-15 | sample homogenized | White | Plaster | No | Client ID: SA-02B (White) | |
| | | | | | | Non-Fibers | 100 |
| 1536289-13 | 03-Sep-15 | sample homogenized | White | Plaster | No | Client ID: SA-02C (White) | |
| | | | | | | Non-Fibers | 100 |
| 1536289-14 | 03-Sep-15 | sample homogenized | White | Plaster | No | Client ID: SA-02D (White) | |
| | | | | | | Non-Fibers | 100 |

**Client:** Greenough Environmental Consulting Inc.
29 Capital Drive
Ottawa, ON K2C 0E7

**Attn:** Mike Mask
Tel: (613) 792-4125
Fax: (613) 792-1077

**Project:** 28768
**Paracel Report No.:** 1536289

**Received Date:** 03-Sep-15
**Report Date:** 04-Sep-15

## Asbestos, PLM Visual Estimation **MDL - 0.5%**

| Paracel I.D. | Sample Date | Layers Analyzed | Colour | Description | Asbestos Detected: | Material Identification | % Content |
|---|---|---|---|---|---|---|---|
| 1536289-15 | 03-Sep-15 | sample homogenized | White | Plaster | No | Client ID: SA-02E (White) | |
| | | | | | | Non-Fibers | 100 |
| 1536289-16 | 03-Sep-15 | sample homogenized | Grey/Green | Insulation | **Yes** | Client ID: SA-03A | |
| | | | | | | **Chrysotile** | 60 |
| | | | | | | MMVF | 5 |
| | | | | | | Non-Fibers | 35 |
| 1536289-17 | 03-Sep-15 | | | | | Client ID: SA-03B | |
| | | | | | | not analyzed | |
| 1536289-18 | 03-Sep-15 | | | | | Client ID: SA-03C | |
| | | | | | | not analyzed | |

*MMVF: Man Made Vitreous Fibers: Fiberglass, Mineral Wool, Rockwool, Glasswool*
**Analytes in bold indicate asbestos content which may include:**
**Actinolite, Amosite, Anthophyllite, Chrysotile, Crocidolite and/or Tremolite.**

## Analysis Summary Table

| Analysis | Method Reference/Description | Lab Location | NVLAP Lab Code * | Analysis Date |
|---|---|---|---|---|
| Asbestos, PLM Visual Estimation | by EPA 600/R-93/116 | Ottawa West Lab | 200812-0 | 4-Sep-15 |

** Reference to the NVLAP term does not permit the user of this report to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.*

## Work Order Revisions / Comments

None

**Appendix 2**
**Analytical Results - Lead**

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# Certificate of Analysis

**Greenough Environmental Consulting Inc.**

29 Capital Drive
Ottawa, ON K2C 0E7
Attn: Mike Mask

Client PO:
Project: 28768
Custody: 105956

Report Date: 4-Sep-2015
Order Date: 3-Sep-2015

**Order #: 1536285**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

| Paracel ID | Client ID |
|---|---|
| 1536285-01 | LS-01 - Off-White |

Approved By:

Dale Robertson, BSc
Laboratory Director

## Analysis Summary Table

| Analysis | Method Reference/Description | Extraction Date | Analysis Date |
|---|---|---|---|
| Metals, ICP-OES | based on MOE E3470, ICP-OES | 4-Sep-15 | 4-Sep-15 |

**Sample Data Revisions**

None

**Work Order Revisions/Comments:**

None

**Other Report Notes:**

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

## Sample Results

| Lead | | | | Matrix: Paint<br>Sample Date: 03-Sep-15 |
|---|---|---|---|---|
| **Paracel ID** | **Client ID** | **Units** | **MDL** | **Result** |
| 1536285-01 | LS-01 - Off-White | ug/g | 20 | <20 |

## Laboratory Internal QA/QC

| Analyte | Result | Reporting Limit | Units | Source Result | %REC | %REC Limit | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **Matrix Blank** | | | | | | | | | |
| Lead | ND | 20 | ug/g | | | | | | |
| **Matrix Duplicate** | | | | | | | | | |
| Lead | 51.0 | 20 | ug/g | 54.7 | | | 7.1 | 30 | |
| **Matrix Spike** | | | | | | | | | |
| Lead | 251 | | ug/L | 14.4 | 94.7 | 70-130 | | | |

## PART 1 - GENERAL

**1.1 Related Sections**

.1 Section 01 00 10 – General Requirements

.2 Section 01 35 30 – Health and Safety Requirements

.3 Section 07 62 00 – Sheet Metal Flashing

**1.2 General**

.1 Provide wood blocking for roofing, window framing, structural steel infill and as indicated on the drawings and as required to provide a finished product.

.2 Provide new painted wood components for window frame components, casings, and as required to provide a finished product.

**1.3 Quality Assurance**

.1 Lumber shall have the grading stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

**1.4 Precautions**

.1 All wood must be sealed the same day any wood is installed.

## PART 2 - PRODUCTS

**2.1 Dimension Lumber**

.1 To CAN/CSA 0141-05 and CAN3-086-M84 and to National Lumber Grades Authority Standard Grading Rules 2003-grade Category as follows:

- .1 Light framing and blocking for concealed application: species group spruce – "Construction" grade.
- .2 Finish application: species group pine – "No. 1"

**2.2 Board Underlay**

.1 Inorganic, fibre based board, thickness as shown on drawings.

.2 Fire resistance: Meets UL 790 Class A; FM Class 1

.3 Mould and moisture resistant to ASTM D3273, 10 Score

**2.3 Fasteners**

.1 Co-ordinate the location and installation of anchors and fasteners. Confirm types of fasteners to be utilized with Departmental Representative.

.2 Do not use dissimilar metals in combination that will set up electrolytic action.

.3 Use non-corrosive, stainless steel or galvanized steel fasteners as approved by Departmental Representative.

.4 Space anchors within load bearing or shear capacity.

.5 Nails, spikes and staples: to CSA B111-1974 (R2003); galvanized for exterior work. Use spiral thread nails except where specified otherwise.

.6 Fasteners to steel: use self-tapping screws.

## PART 3 - EXECUTION

**3.1 Securement**

.1 Secure to substrate with suitable fasteners, galvanized minimum 9mm diameter of a suitable embedment length.

.2 Fasteners should penetrate steel substrates a minimum of 13mm. Use wood blocking to fill voids as required.

**3.2 Nailing**

.1 All nails shall be long enough so that not less than half their length penetrates into the second member.

.2 Splitting of wood members shall be minimized by staggering the nails in the direction of the grain and by keeping nails well in from the members edge.

**3.3 Board Underlay**

.1 Leave a space of 2mm between sheets to allow for material expansion.

.2 Every piece shall have a minimum fastening pattern of 600mm o/c. Minimum distance between 2 fasteners shall be half their length and the minimum distance from the edge of the plywood shall be a quarter of their length.

| | | |
|---|---|---|
| **3.4 New Construction Dimensions** | .1 | Maximum spacing between studs to be as indicated on drawings and as per applicable framing guides. |

**END OF SECTION**

**PART 1 - GENERAL**

**1.1 REFERENCES**

.1 American Society for Testing and Materials International (ASTM)
- .1 ASTM B117-09, Standard Practice for Operating Salt Spray (Fog) Apparatus.
- .2 ASTM D968, Standard Test Methods for Abrasion Resistance of Organic Coatings by the Falling Abrasive.
- .3 ASTM D2247, (U.S. Federal Test 141A 6201), Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
- .4 ASTM E72, Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
- .5 ASTM E96/E96M, Standard Test Methods for Water Vapor Transmission of Materials.
- .6 ASTM E695, Standard Method for Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading.
- .7 ASTM G154, Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials.
- .8 ASTM E2321, Standard Practice for Use of Test Methods E96/e96M for Determining the Water Vapor Transmission (WVT) of Exterior Insulation and Finish Systems (EIFS)
- .9 ASTM E2430, Standard Specification for Expanded Polystyrene (EPS) Thermal Insulation Boards for us in Exterior Insulation and Finish Systems.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.162, Emulsion Coating for Stucco and Masonry.
- .2 CAN/CGSB-19.24, Multicomponent, Chemical-Curing Sealing Compound.

.3 Canadian Standards Association (CSA International)
- .1 CAN/CSA-A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .2 CSA-A3001-[03], Cementitious Materials for Use in Concrete.

.4 Health Canada (HC)
- .1 Workplace Hazardous Materials Information System (WHMIS).
- .2 Material Safety Data Sheets (MSDS).

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S101-07, Standard Methods of Fire Endurance Tests of Building Construction and Materials.

.2 CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.3 CAN/ULC-S716.1-09, Standard For Exterior Insulation and Finish Systems (EIFS) - Materials and Systems.

.4 CAN/ULC-S716.3-10, Standard For Exterior Insulation and Finish Systems (EIFS) - Design Application.

**1.2 DEFINITIONS**

.1 Aesthetic joint: joint for appearance or installation ease. Also known as reveals grooves and reglets used to provide starting and stopping points during application of finish coat.

.2 Base coat adhesive: adhesive used in base coat. Polymer modified, polymer based or cementitious material, typically mixed with Portland cement.

.3 Base coat: base coat consists of 2 components; base coat adhesive and reinforcing mesh.

.4 Back-wrapping: at edges (termination) of EIFS where the reinforcing mesh and base coat extend from the back side of the insulation around the termination edge and onto the front of the insulation.

.4 Direct-Applied: direct-applied systems use EIFS-like coatings applied directly to rigid sheathing boards. Insulation is not used in these systems, thus, they are not EIFS.

.5 Lamina: base coat reinforcing mesh and finish.

.6 Reinforcing mesh: woven glass fibre reinforcement to base coat providing impact resistance.

**1.3 SYSTEM DESCRIPTION**

.1 Performance requirements: ensure installed modified polymer (soft) coat wall system has following performance properties:

- .1 Comply with CAN/ULC-S134.
- .2 Finish abrasion resistance: falling sand method to ASTM D968, no deleterious effects.
- .3 Finish salt spray resistance: to ASTM B117, after 300 hours exposure to 5% salt spray solution - no effects.
- .4 Finish moisture resistance: to ASTM D2247 after 14 days exposure - no deleterious effects.
- .5 Accelerated weathering: to CAN/CGSB-1.162.

.2 Exterior insulation and finish system to be a site applied cladding system consisting of barrier coating, adhesive, insulation board with integral drainage channels, bottom venting, base coat with reinforcing mesh and finish coat. Standard of Acceptance for Material:
- .1 Outsulation Plus (NC) System by Dryvit Canada;
- .2 Senergy by BASF Canada;
- .3 or Approved Alternate.

**1.4 SUBMITTALS**

.1 Provide submittals in accordance with Section 01 33 00.

.2 Product Data:
- .1 Submit product data.
- .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00. WHMIS acceptable to Labour Canada, and Health and Welfare Canada for exterior finish - direct applied materials. Indicate VOC content.
- .3 Submit product data sheets for system materials. Include product characteristics, performance criteria, limitations and colours.

.3 Shop Drawings: submit shop drawings and indicate wall layout, details, connections, expansion joints, finish system, installation sequence, including interface with fascia, walls, air barriers, vapour retarders and other components.

.4 Samples:
- .1 Submit three 300 x 300 mm samples of each colour and texture of finished system prior to fabrication of mock-up.

**1.5 QUALITY ASSURANCE**

.1 Quality Assurance
- .1 Installation of exterior finish system by applicators certified by manufacturers of system used.
- .2 Submit certification to Departmental Representative prior to commencement of work.
- .3 All Materials to be sourced from same manufacturer as approved finishing system.

.2 Mock-ups:
- .1 Construct mock-up in accordance with Section 01 33 00.
- .2 Construct two mock up of complete exterior finish system on typical exterior wall 500 mm long x 500 mm wide incorporating:
  - .1 Joints to demonstrate aesthetic, control and

expansion joint construction.
.2 Construction at changes in substrate.
.3 Construction at fascias.
.4 Construction at penetrations.
.5 Colour, texture and finish.

.3 Construct mock-up where directed.

.4 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with work.

.5 When accepted, selected mock-up will demonstrate minimum standard for work, and may remain as part of finished work.

**1.6 DELIVERY, STORAGE AND HANDLING**

.1 Deliver, store and handle materials in their original, unopened packages with labels intact. Questionable material shall not be used.

.2 Deliver and store materials in accordance with manufacturer's instructions.

.3 Protect materials from freezing.

.4 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of insulation, adhesive and caulking materials.

**1.7 AMBIENT CONDITIONS**

.1 Temperature, relative humidity, moisture content.
.1 Apply exterior finish system components at temperatures, relative humidity, and substrate moisture content and substrate temperature in accordance with manufacturer's written instructions.
.2 Maintain ambient temperature above 4°C during base coat application and until cured minimum 24 hours.
.3 Maintain ambient temperature above 4°C during finish coat application and until cured minimum 24 hours.

**PART 2 - PRODUCTS**

**2.1 SUBSTRATES**

.1 Sheathing: Oriented strand board (OSB), nominal 12.7mm, installed as per Section 061010 Carpentry.

.2 Water-resistive barrier, drainage spacer, sealants: Submit material and installation instructions as per the system manufacturer's instructions.

**2.1 SURFACE PREPARATION**

.1 Conditioner: Acrylic, clear conditioner/sealer compatible with system materials, recommended by system manufacturer.

.2 Leveller: polymer-modified, cement-based, reinforced levelling compound.

**2.2 INSULATION**

.1 Channeled, moulded, expanded polystyrene (EPS): to CAN/ULC-S710, Type 1, RSI per requirements of the Ontario Building Code (most recent edition). Drain channels to be a minimum 1" wide by ¼" deep, spaced at 12" o/c max.

**2.2 BASECOAT**

.1 Modified, cementitious base coat system: cement, silica sand aggregate, acrylic liquid admixture, to cement ratio 1:1, texture and colour as per system manufacturer's instructions.

**2.3 REINFORCING MESH**

.1 Balanced, open weave glass fibre fabric made from twisted multi-end strands, treated, alkali resistant, compatible with chemical bonding system base coat and finish coat and supplied by system manufacturer.

.2 Speciality mesh:

.1 Detail mesh: flexible, symmetrical, woven glass fibre fabric made from twisted multi-end strands, treated, alkali resistant, compatible with chemical bonding system base coat and finish coat.

**2.4 FINISH COAT**

.1 Modified polymer finish coat system: acrylic resins in dispersion, silica aggregate, integral mineral pigmentation and additives, colour selected from standard colour palette by Departmental Representative.

.2 Modified finish coat system: synthetic stucco, cement, silica sand aggregate, integral mineral pigmentation and additives, colour and exposed aggregate sized to match sample and mock-up. Finish coat to be recommended by and supplied by system manufacturer.

**2.6 ACCESSORIES**

.1 Accessories: galvanized corner beads, casing beads, stop beads, and accessories, as recommended by exterior finish system manufacturer to suit system components.

.2 Bottom venting assembly or drainage mat compatible with approved EIFS, as recommended by the manufacturer and approved by Departmental Representative.

**2.7 EXPANSION JOINTS**

.1 Expansion joints: galvanized. Set at spacing as per system manufacturer's instructions.

.2 Ensure expansion joints are back wrapped.

.3 Joint Cleaner: non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.4 Sealant primer: as recommended by sealant manufacturer.

.5 Joint filler: extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 - 200 kPa, outsized 30 to 50%.

.6 Sealant: As per section 07 92 00 – Joint Sealants. Ensure joint sealants are compatible, based on system manufacturer's recommendations.

**2.9 MIXES**

.1 General:
- .1 Mixer: high speed, clean and rust free.
- .2 Mixing pail: clean and rust free.
- .3 Mixes: additive free.

.2 Conditioner: mix in accordance with manufacturer's written instructions.

.3 Leveller: mixed to uniform consistency in accordance with manufacturer's written instructions.

.4 Basecoat: mixed to uniform consistency in accordance with manufacturer's written instructions.

.5 Finish coat: mixed to uniform consistency in accordance with manufacturer's written instructions.

**PART 3 - EXECUTION**

**3.1 MANUFACTURER'S INSTRUCTIONS**

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets. Where these specifications and project drawings differ from manufacturer's written recommendations or specifications, submit for clarification from Departmental Representative and Manufacturer as per Section 01 33 00 - Submittals.

**3.2 EXAMINATION**

.1 Report deviations from specified requirements or other conditions that might adversely affect exterior finish system installation in writing to Departmental Representative.

.2 Proceed with Work only after receipt of written approval from Departmental Representative.

**3.3 PREPARATION**

.1 Protection:
- .1 Protect adjacent surfaces from damage resulting from Work of this section.
- .2 Protect finished Work from water penetration at end of each day or on completion of each section of Work.
- .3 Protect installation from moisture for 48 hours minimum after completion of each portion of Work.

.2 Surface preparation:
- .1 Ensure environmental and site conditions are suitable for installation of system.
- .2 Prepare new surfaces in accordance with manufacturer's written instructions.
- .3 Leveller: polymer-modified, cement based, reinforced levelling compound.
  - .1 Add water and mix.
  - .2 Allow set time.
  - .3 Apply to existing substrate, 6 mm thick maximum.
  - .4 Allow time to fully cure.

**3.4 INSTALLATION**

.1 Install system in accordance with CAN/ULC-S134.

.2 Surface Preparation:

.1 Clean substrate of all debris, dust and deleterious substances that may affect the bond between the substrate and EIFS cladding.

.2 Conditioner: water base or acrylic clear conditioner/sealer compatible with system materials, substrate and as recommended by system manufacturer.

.1 Add water and mix.

.2 Apply to clean, dry substrate surfaces ensuring complete even coverage in accordance with manufacturer's written instructions.

.3 Leveller: Polymer-modified, cement based, levelling compound.

.1 Add water and mix.

.2 Allow set time.

.3 Apply to existing substrate, ¼" (6mm) thick maximum.

.4 Allow time to fully cure as outlined in manufacturers written instructions.

.4 Barrier Coating: Air/water resistant coating, cementitious type.

.1 Mix and apply in accordance with manufacturers most recent, written specifications.

.3 Mechanical insulation anchors: Not permitted.

.4 Adhesives application and installation of insulation board:

.1 Apply uniform ribbons of adhesive to back of insulation board, using recommended notched trowel. Ensure trowel notches are tooled in vertical direction only.

.2 Offset insulation joints.

.3 Immediately place insulation boards in required pattern. Apply firm pressure over entire surface of board to ensure full contact.

.4 Butt vertical and horizontal joints tightly together. Ensure joints between boards are free of adhesive.

.5 Back-wrapping

.1 Ensure edge of insulation board is wrapped with base coat prior to installation to substrate.

.2 Apply strip of detail mesh with adhesive to substrate at level base line and at terminations.

.3 Ensure width of detail mesh is adequate to adhere 4-inch (100mm) of mesh onto substrate and to wrap around insulation board edge with minimum 2½-inches (64mm) coverage on outside of insulation

board.

.4 After adhering detail mesh to substrate ensure, mesh ends hang free for completion of back-wrapping procedure after insulation application.

.6 Accessories

.1 Install bottom venting/drainage mat where required as per the system manufacturers most recent, written specifications.

.7 Preparation of Insulation Board Surface

.1 Fill open joints in insulation board with compatible spray foam and allow to cure prior to proceeding with coating application.

.2 Rasp surface to achieve smooth, level, even surface after insulation boards have firmly adhered to substrate. Remove ultraviolet ray damage. Rasp smooth any irregularities in insulation board greater than 0.12-inches (3mm). Ensure insulation board tolerance not greater than ¼" (6mm) in 10' (3,000mm) and in accordance with manufacturer's written instructions.

.3 Contractor is to control rasp shavings. Utilize rasps with vacuum pack attachments and enclose work area as required.

.8 Back-wrapping Completion

.1 Complete back-wrapping procedure by applying base coat to exposed edges of insulation board and 4-inches (100mm) onto face of insulation board.

.2 Pull mesh tight around board and embed it in base coat with corner trowel for clean, straight lines.

.3 Smooth wrinkles or gaps in mesh.

.9 Mesh and Base Coat Application

.1 Apply 9x12-inch (225x300mm) diagonal strips of detail mesh at corners of windows and penetrations through insulation. Embed strips in wet base coat and trowel from centre to mesh edge to avoid wrinkles.

.2 Apply detail mesh at reveals. Embed mesh in wet base coat and trowel from base of reveal to mesh edges.

.3 Apply corner mesh at inside and outside corners.

Embed mesh in wet base coat and trowel from corner of mesh edges.

.4 Standard mesh application:

.1 Apply base coat over insulation board, to uniform thickness of approximately 0.12-inches (3mm).

.2 Work horizontally or vertically in 39-inch (1,000mm) strips, and immediately embed mesh into wet base coat by towelling from centre to mesh edge.

.3 Overlap mesh 2.5 inches (64mm) minimum at mesh seams and overlaps of detail mesh.

.4 Feather seams and edges.

.5 Double wrap inside and outside corners with minimum 2.5-inch (64mm) overlap in each direction. Embed corner mat in wet base coat, allow to dry, then overlap up to corner with standard reinforcing mesh embedded in base coat.

.6 Avoid wrinkles in mesh.

.7 Embed mesh so that no mesh shows through base coat when dry.

.8 Ensure minimum base coat thickness 0.06-inch (1.6mm) when dry. Re-skim base coat if minimum thickness is not achieved during initial application. Allow base coat to thoroughly dry before applying primer or finish coat.

.10 Finish Coat Application

.1 Apply finish coat in accordance with manufacturer's most recent, written installation instructions.

.2 Apply finish coat directly over base coat, or primed base coat, only after base coat or primer has thoroughly dried.

.3 Apply finish by spray or trowel as recommended by manufacturer.

.4 Apply finish in continuous application, and work towards wet edge.

.5 Do not install separate batches of finish coat side by side.

.6 Do not apply finish into or over sealant joints.

.7 Do not apply finish over irregular or unprepared surfaces.

.8 Apply textured or aggregate finishes to wall areas as indicated and in accordance with manufacturer's written instructions.

**3.5 CLEAN UP**

.1 Upon completion of installation remove excess materials, droppings and debris, tools and equipment barriers.

.2 Clean surface and adjacent work area of foreign materials resulting from installation procedures.

**END OF SECTION**

## PART 1 - GENERAL

**1.1 SECTION INCLUDES**

.1 Materials and installation for sheet metal roofing.

**1.2 RELATED SECTIONS**

.1 Section 07 62 00 – Sheet Metal Flashings

.2 Section 06 10 10 – Rough Carpentry

**1.3 REFERENCES**

.1 American Society for Testing and Materials 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 Canadian General Standards Board (CGSB).
- .1 CAN/CGSB-51.32-[M77], Sheathing, Membrane, Breather Type.

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
- .1 Material Safety Data Sheets (MSDS).

.4 National Research Council Canada (NRC)/Institute for Research in Construction (IRC) - Canadian Construction Materials Centre (CCMC).
- .1 CCMC, Registry of Product Evaluations.

**1.4 SUBMITTALS**

.1 Submit proof of manufacturer's CCMC Listing and listing number to Departmental Representative for review.

.2 Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence, and cleaning procedures.

.3 Submit WHMIS MSDS - Material Safety Data Sheets.

.4 Submit product data sheets for roofing components. Include:
- .1 Product characteristics.
- .2 Performance criteria.
- .3 Limitations.

.5 Submit shop drawings as required by specifications.

.6 Submit 300 x 300mm samples of each sheet metal material.

## PART 2 - PRODUCTS

**2.1 SHEET METAL MATERIALS**

.1 Zinc coated steel sheet: to ASTM A653/A653M, commercial quality, with Z275 coating, regular spangle surface, prefinish as specified, 24 Ga. thickness.

.2 Standard of Material Acceptance/Profile Characteristics:

.1 Heritage Series with Concealed Fastener Accessories by Ideal Roofing.

.2 Prestige Metal Roof System with Concealed Fastener Accessories, by Vicwest.

.3 Or approved alternate.

**2.2 PREFINISHED STEEL SHEET**

.1 Prefinished steel with factory applied polyvinylidene fluoride.

.1 Class F1S.
.2 Colour selected by Owner from manufacturer's standard range.
.3 Specular gloss: 25 units +/-5 to ASTM D523.
.4 Coating thickness: not less than 22 micrometers.
.5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20% to ASTM D822 as follows:
.1 Outdoor exposure period 2500 hours.
.2 Humidity resistance exposure period 5000 hours.

**2.5 ACCESSORIES**

.1 Roofing flashings & closures: Prefinished sheet metal to match roofing panels. All pre-manufactured accessories to include concealed fasteners.

.2 Isolation coating: alkali resistant bituminous paint.

.3 Plastic cement: to CAN/CGSB-37.5.

.4 Underlay/Membrane standard of acceptance: ‘Blueskin RF 200’ by Henry Company; ‘Lastobond Shield HT’ by Soprema; Or approved equivalent.

.5 Slip sheet: reinforced sisal paper or a heavy felt kraft paper.

.6 Rubber-asphalt sealing compound: to CAN/CGSB-37.29.

.7 Fasteners: concealed, as per manufacturer's instructions.

.8 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

.9 Touch-up paint: as recommended by sheet metal roofing manufacturer.

**2.6 FABRICATION**

.1 Form individual pieces in 2400 mm maximum lengths. Make allowances for expansion at joints.

.2 Hem exposed edges on underside 12 mm, mitre and seal.

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

.4 Apply minimum 0.2 mm dry film thickness coat of plastic cement to both faces of dissimilar metals in contact.

.5 Protect dissimilar metals against oxidization by backpainting with isolation coating where indicated.

**PART 3 EXECUTION**

**3.1 INSTALLATION**

.1 Use concealed fastenings except where approved by Departmental Representative before installation.

.2 Provide self-adhering eave protection membrane underlay over new roof sheathing. Secure in place and lap joints 100 mm minimum, as per manufacturer's instruction.

.3 Install new furring in vertical and horizontal application to provide continuous vented surfaces between the sheet metal roofing and self adhering membrane. Set furring at manufacturer's recommended fastening spacing.

.3 Apply sheet metal roofing beginning at eaves.

.4 Form 90 degree angle upturns at all dormer knee walls. At all other intersections:

.1 Extend upturn flashing sheet minimum 150 mm under roofing sheets.

.2 At upturn lines, double fold valley and roofing sheets and secure with cleats spaced 450 mm on centre.

.5 Lap joints 150 mm in direction of flow.

.6 Install sheet metal roof panels using concealed fasteners sized to penetrate through furrings into sheathing as per manufacturer's recommended fastener spacing.

.7 Stagger transverse seams in adjacent panels.

.8 Flash roof penetrations with material matching roof panels, and make watertight.

.9 Form seams in direction of water-flow and make watertight.

**END OF SECTION**

## PART 1 - GENERAL

**1.1 RELATED SECTIONS**

.1 Section 01 00 10 – General Requirements

.2 Section 01 33 00 – Submittal Procedures

.3 Section 06 10 10 – Rough Carpentry

.4 Section 07 61 00 – Sheet Metal Roofing

.5 Section 07 92 00 – Joint Sealants

**1.2 GENERAL**

.1 Install all sheet metal caps, counter flashings, sidings and all other metal flashings required to complete roofing installation.

.2 Form to profiles as detailed upon the drawings, to match existing or as required to suit site conditions.

**1.3 SAMPLES**

.1 Submit samples of sheet metal flashing specified before proceeding, showing proposed method shaping, forming, jointing and fastening.

**1.4 WORKMANSHIP**

.1 Sheet metal flashing work shall be carried out in accordance with the best standard practices; with joints locked, cleated, caulked as required and all exposed edges hemmed. Ample allowance shall be made in all work for expansion and contraction.

.2 Mitred corners shall be straight and true profiles, with flat surfaces free of distortion and free of face nailing.

**1.5 REFERENCES**

.1 Standard practices, unless otherwise noted herein, shall be deemed to constitute recommended procedures published in S.M.A.C.N.A. Architectural Manual.

**1.6 WARRANTY**

.1 Remedy all defects in the sheet metal flashings installed hereunder, which appear within a period of two (2) years from the date of substantial performance.

.2 Make all necessary repairs and replacements within 48 hours of receipt of written notification.

.3 Provide a written warranty confirming the above, issued on the corporate letterhead, and sealed by an authorized company official.

.4 Nothing containing in this Article shall be construed as in any way restricting or limiting the liability in Common Law and statutory liability of the Contractor.

## PART 2 - PRODUCTS

**2.1 METAL FLASHINGS**

.1 Metal flashings shall be 24 gauge (0.71mm) commercial galvanized to ASTM A653/A653M-02a. Coating standard of acceptance designation G90, PPD 8000 Series, standard colour to be selected by Departmental Representative.

.2 Where metal flashing is in contact with dissimilar metal, use separation sheet or backpaint to suitable thickness (as approved by manufacturer) to prevent electrolytic action.

**2.2 CAULKING**

.1 Sealing compound to be a one (1) component polyurethane base caulking compound to CGSB 19.13-M87. Standard of Acceptance: Tremco Dymonic or Sikaflex 1a, or approved alternate. Sealant compound to be installed in accordance with manufacturer's recommendations.

**2.3 STARTER STRIP**

.1 Starter strips to be manufactured from the same type of material used for cap and counter flashings, and shall be 24 gauge (0.71mm).

**2.4 ACCESSORIES**

.1 Fastening cleats to be manufactured from the same type of material used for cap and counter flashings. For 24 gauge (0.71mm), space at 600mm o/c and for 26 gauge (0.55mm) space at 400mm o/c.

.2 Fastening Bars to be 18 gauge metal and pre-drilled at 400mm o/c.

.3 Fasteners to be of same material as sheet metal, galvanized flat head roofing nails to CSA B111-1974 (R2003), of length and thickness suitable for metal flashing application. Cadmium plated screws, coloured head.

.4 Isolation coating: alkali resistant bituminous paint. Touch-up paint as recommended by pre-finished material manufacturer.

## PART 3 - EXECUTION

**3.1 INSTALLATION**

.1 Use concealed fastenings except where approved by

Departmental Representative prior to installation.

.2 All free edges of metal flashings shall be strengthened by a fold at least 13mm wide, set out slightly and presenting a straight line and neat finish. Form flashings in 2.4m lengths, making allowance for expansion. When flashings exceed 600mm in height form flashing in 1.2m lengths.

.3 Metal shall be formed on a bending brake, shaping, trimmed and hard seaming shall be done on a bench, as far as practicable, with proper sheet metal working tools. Angles of bends and folds for interlocking metal shall be made with full regard to expansion and contraction to avoid buckling or fullness in service and to avoid damaging surfaces of metal.

.4 Dry joints are to be tight but not dented so as to permit slight adjustments of sheets and yet remain watertight.

.5 Lock seams at all corners. Apply continuous lock across length.

.6 Do not install fasteners through cant strips.

.7 Apply isolation coating to metal surfaces to be embedded in concrete or mortar, and between dissimilar metals.

.8 Form seams in direction of water-flow and make watertight.

**3.2 ANCHORS AND FASTENERS**

.1 Space fasteners evenly and in an organized pattern. Where exposed to view, use metal fasteners of same material, colour, texture and finish. Obtain approval prior to installing any exposed fasteners.

**3.3 CAP FLASHING**

.1 Supply and install continuous metal starter strips, secure at 600mm o/c maximum of 50mm above drip edge, with fasteners of sufficient length to penetrate a minimum of 25mm into substrate.

.2 Supply and install metal cleats at specified spacing. Use fasteners of sufficient length to penetrate a minimum of 25mm into substrate.

.3 Use concealed fastening except where approved by Departmental Representative.

.4 Secure sections of metal in S-lock joints on all faces and allow for sufficient expansion and contraction between each piece. Ensure drip edges are inserted into the drip of adjacent section.

.5 Form cap flashing to ensure positive drainage to the interior (roof surface) areas.

**3.4 FASTENING BARS**

.1 Install metal fastening bars, secured at 400mm o/c with self-tapping flat head screws. Fastener length to be 19mm. Fasteners to be approved by Departmental Representative.

**3.5 SEALANTS**

.1 Install sealants in accordance with manufacturer's latest recommendations and guidelines.

.2 Provide foam backer rod for joints greater than 19mm wide and 25mm deep, prior to installing caulking compound.

.3 Tool finish to satisfaction of Departmental Representative.

**3.6 FINISH**

.1 Finished sheet metal flashing work shall be clean and left in neat, workmanlike condition. Adjoining materials shall be properly cleaned of soil caused by this trade; debris/soil shall be removed from site to satisfaction of Departmental Representative.

**END OF SECTION**

## PART 1 - GENERAL

**1.1 RELATED REQUIREMENTS**

.1 Sheet Metal Flashings – Section 07 62 00.

.2 Sheet Metal Roofing – Section 07 61 00

.3 Exterior Insulation and Finish System – Section 07 24 00

**1.2 REFERENCES**

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

.1 ASTM C919-02, Standard Practice for Use of Sealants in Acoustical Applications.

.2 ASTM C920-05, Standard Specification for Elastomeric Joint Sealants.

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

.1 Material Safety Data Sheets (MSDS).

**1.3 SUBMITTALS**

.1 Submit product data in accordance with Section 01 33 00.

.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 manufacturer's instructions in accordance with Section 01 33 00.

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

**1.4 QUALITY ASSURANCE/ MOCK-UP**

.1 Construct mock-up in accordance with Section 01 45 00.

.2 Construct mock-up to show location, size, shape and depth of joints complete with back-up material, primer, caulking and sealant.

.3 Mock-up will be used:

.1 To judge workmanship, substrate preparation, operation of equipment and material application.

.4 Locate where directed.

.5 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with sealant work.

.6 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-up may remain as

part of finished Work.

**1.5 DELIVERY, STORAGE, AND HANDLING**

.1 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

**1.6 PROJECT CONDITIONS**

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4°C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

**1.7 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 Labour Canada.

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

## PART 2 - PRODUCTS

**2.1 SEALANT MATERIAL DESIGNATIONS**

.1 Urethanes One Part.

.1 Non-Sag to CAN/CGSB-19.13, Type 2, Moisture-cure, high-performance, low-modulus, non-sag, pure polyurethane sealant to ASTM C920 Type S, Grade NS, Class 25, two (2) different colours to selection by Departmental Representative from manufacturer's standard range.

.2 Standard of Acceptance: Dymonic by Tremco, or accepted equal.

.2 Preformed Compressible and Non-Compressible back-up materials.

.1 Polyethylene, Urethane, Neoprene or Vinyl Foam.

.1 Extruded open or closed cell foam backer rod.

.2 Size: oversize 30 to 50%.

.2 Bond Breaker Tape.

.1 Polyethylene bond breaker tape which will not bond to sealant.

**2.3 JOINT CLEANER**

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primer: as recommended by manufacturer.

**PART 3 - EXECUTION**

**3.1 PROTECTION**

.1 Protect installed Work of other trades from staining or contamination.

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

.3 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.

.4 Ensure joint surfaces are dry and frost free.

.5 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 to 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 Cleanup.

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

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

.3 Remove masking tape after initial set of sealant.

**END OF SECTION**