



PROJECT DOCUMENTS

COMPREHENSIVE ROOF RENEWAL

BUILDING 27 – GRANVILLE ISLAND

**1241 CARTWRIGHT STREET
VANCOUVER, BC**

Date: 5/26/2015

JRS Project No. VR15067

ISSUED FOR TENDER

Owner: **Canadian Mortgage and Housing Corporation**
1661 Duranleau Street, 2nd Floor
Vancouver, BC, V6H 3S3

Consultant: **JRS Engineering Ltd.**
300 – 4595 Canada Way
Burnaby, BC, V5G 1J9
Tel: (604) 320-1999
Fax: (604) 320-1991

Project Engineer: Scott Croasdale, M. Eng., P. Eng., PE

Project Manager: Josh Jensen, ASCT, CHI, RRO, RRC

Project Consultant: Jose Rodriguez, M.Eng., TQ, Red Seal

| GROUP | SECTION | TITLE | PAGES | |
|--|----------------|---|--------------|--|
| PROCUREMENT & CONTRACTING REQUIREMENTS | 00 01 10 | Table of Contents | 01 | |
| | 00 01 15 | List of Drawing Sheets | 01 | |
| SPECIFICATIONS | 01 00 00 | General Requirements | 01-03 | |
| | 01 11 00 | Summary of Work | 01-03 | |
| | 01 31 00 | Project Management & Coordination | 01-05 | |
| | 01 40 00 | Quality Requirements | 01-03 | |
| | 01 50 00 | Temporary Facilities and Controls | 01-03 | |
| | 01 54 23 | Temporary Scaffolding and Platforms | 01-05 | |
| | 01 73 29 | Cutting and Patching | 01-02 | |
| | 01 77 00 | Closeout Procedures | 01-03 | |
| | 01 78 36 | Warranties | 01-02 | |
| | 02 41 00 | Demolition | 01-02 | |
| | 02 85 00 | Mould Remediation | 01-05 | |
| | 06 05 73 | Wood Treatment | 01-03 | |
| | 06 10 00 | Rough Carpentry (inclusive of wood furring) | 01-05 | |
| | 07 21 13 | Rigid Insulation | 01-03 | |
| | 07 27 19 | Breathable Air Barrier Membrane | 01-03 | |
| | 07 54 23 | TPO Membrane Roofing | 01-05 | |
| | 07 60 00 | Flashing and Sheet Metal | 01-05 | |
| | 07 61 13 | Standing Seam Sheet Metal Roofing | 01-05 | |
| | 07 92 00 | Sealant | 01-05 | |
| | 09 28 16 | Fibre-reinforced Gypsum Board | 01-03 | |
| | END OF SECTION | | | |

| GROUP | DRAWING TITLE | NUMBER |
|--------------------|----------------------|---------------|
| GENERAL | Drawing Index | BE-0.01 |
| | Roof Schedule | BE-0.01 |
| PLANS & ELEVATIONS | Roof Plan | BE-1.01 |
| ROOF DETAILS | Roof Ridge/Hip | BE-2.01 |
| | Roof Eaves | BE-2.01 |
| | Roof Edge | BE-2.02 |
| | Curbed Roof Vent | BE-2.03 |
| | Roof @ Back Wall | BE-2.04 |
| | Plumbing Stack | BE-2.04 |
| | Roof Parapet | BE-2.05 |
| | Scupper | BE-2.05 |
| | Base of Wall @ Roof | BE-2.06 |
| | Plumbing Stack | BE-2.06 |

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Section Includes: General administrative and procedural requirements of the Project.
- .2 The Work of the Contract is detailed in the Contract Documents and includes the supply of all labour, Products, materials, services and incidentals in order to perform and complete the Work.
- .3 Except where specified otherwise, Division 01 requirements apply to Work of all other Specifications sections.

1.2 Definitions

- .1 For clarity and consistency, the following definitions and conventions will be used throughout these Specifications:
 - .1 **Provide** means to supply new and install complete and ready for use.
 - .2 **Reinstall** means to reinstall materials previously removed.
 - .3 **Shop Drawings** are drawings, diagrams, illustrations, schedules, performance charts, brochures, Product data and other data that the Contractor provides to illustrate details of portions of the Work.
 - .4 **As required** means “as required to suitably complete the Work”.
 - .5 **Indicated** means “where reasonably implied and necessary in conformance with work specified, drawn, or required for completion by words or drawings”.
 - .6 These Specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words “shall be” are included by inference where a colon (:) is used within sentences or phrases.

1.3 Confidentiality

- .1 At all times, maintain as confidential the information provided during tendering and performance of the Project. Do not enter into discussion of the Work with any persons or agencies without prior written consent of the Consultant, Owner, or Owner’s representative.
- .2 The obligation for confidentiality of Project information survives termination of the Contract.

1.4 Reference Standards

- .1 Referenced standards form part of Contract Documents and have same force and effect as if bound within these Specifications.
- .2 Where copies of standards are required to ensure conformance of a construction activity, obtain copies of industry standards directly from publisher.
- .3 The titles of industry-standard organizations are commonly abbreviated. Full titles may be found in the Encyclopedia of Associations or may be requested of Consultant.
- .4 Where conflicts arise between one document or authority and another, the more stringent regulation or requirement shall apply.

1.5 Project/Site Conditions

- .1 Surveys and reports of existing conditions, including locations of utilities, are provided by Owner without warranty as to accuracy or completeness and are intended as general reference to probable conditions.
- .2 Field-verify site conditions prior to conducting Work.
- .3 Weather conditions permissible for conducting Work are subject to discretion of Contractor and Consultant.
- .4 Only conduct work where substrates and conditions are appropriately prepared and ready to receive Work. Starting work of each section will be interpreted as acceptance by Contractor of existing substrates and conditions.

1.6 Contract Modifications

- .1 Requests for Interpretation (RFI) are used to request direction from Consultant or clarification about information insufficiently described or detailed in Contract Documents, and which will not require a change to contract sum or time. Submit Requests for Interpretation on form provided in Section 00 62 13.
- .2 Contemplated Change Orders: Upon receipt of Contemplated Change Order, submit estimate sheets describing cost of change(s) in the Work and impact on project timeline to Consultant.
- .3 Contractor Requests for Modification: Submit estimate sheets for Work that Contractor wishes Consultant to consider for a Change Order to the Contract. Include reason(s) for requested change(s), cost of change(s) in the Work and impact on project timeline.
- .4 Include the following information in estimate sheets:
 - .1 Exact location of change(s).
 - .2 Required materials.
 - .3 Required labour, in manhours of each labour charge-out rate.
 - .4 Total additional days required to complete the Contract.
- .5 Do not proceed with proposed change(s) in Work until estimate sheet has been reviewed and approved by both Consultant and Owner.
- .6 Approved estimate sheets must be signed and dated by Consultant and Owner before being incorporated into a Change Order

1.7 Cleanliness & Protection of Work

- .1 Promptly as work proceeds and at completion, clean up and remove from premises all rubbish and surplus materials resulting from Work.
- .2 Remove waste material and debris from site and deposit in a waste container at end of each working day.
- .3 Failure to remove debris and maintain site in a tidy condition daily is cause for Owner to have premises cleaned and deduct cost of cleaning from Contract price.

- .4 Immediately clean up spilled and excess primers and mastic sealants that will not be completely covered by subsequent work. Make good appearance of exposed areas.
- .5 Clean and make good exterior areas and interior areas as required as a result of Work to satisfaction of Owners and Consultant. Complete final cleaning as required by Project documents.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Section Includes:
 - .1 Title and description of the Work
 - .2 Contract method
 - .3 Contractor use of premises
 - .4 Owner occupancy
 - .5 Work sequence
 - .6 Scope of Work
- .2 Related Sections:
 - .1 01 00 00 General Requirements
 - .2 01 31 00 Project Management and Coordination
 - .3 01 40 00 Quality Requirements
 - .4 02 41 00 Demolition
 - .5 02 85 00 Mould Remediation

1.1 Work Included in Contract

- .1 Work of this Contract comprises Comprehensive Roof Renewal to Building 27 located at 1241 Cartwright Street, Vancouver, BC.

1.2 Contract Method

- .1 Stipulated price with unit pricing.
- .2 Canada Mortgage and Housing Corporation (CMHC) standard construction document forming part of this agreement.

1.3 Contractor Use of Premises

- .1 Coordinate use of premises under direction of Owner and Consultant.
- .2 Assume full responsibility for protection and safekeeping of products under this Contract.
- .3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

1.4 Owner Occupancy

- .1 Fully Occupied. Conduct all work with minimal disturbance of or inconvenience to building occupants.
- .2 Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

- .3 Occupancy and use of premises by the Owner does not constitute acceptance of the Work

1.5 Work Sequence

- .1 Construct Work in stages to accommodate continued occupant use of premises during construction.
- .2 Undertake the Work in a manner that allows for completion of Work of a reasonably-sized area before proceeding with the next area, according to the approved schedules.
- .3 Coordinate the Work with the Owner and Consultant and execute the Work to accommodate existing conditions and dimensions.

1.6 Scope of Work

.1 DEMOLITION PHASE

.1 Sheet Metal Flashings

- .1 Remove and dispose of existing sheet metal flashings and materials within the scope of work, including but not limited to:
 - .1 Parapet cap flashings at roofs
 - .2 Base-of-wall flashings

.2 Cladding Removal (within the scope of roof replacement)

- .1 As required by the work, remove cladding to facilitate access to the roofing work.

.3 Low-Slope Roofs

- .1 Remove and dispose of the following existing components and assemblies:
 - .1 Sheet metal flashings, roof membrane, vents, cap flashings and other accessories to the level of the existing roof substrate.

.4 Pitched Roofing

- .1 Remove and dispose of the following existing components and assemblies:
 - .1 Metal roofing, sheet metal flashings, underlay, vents, chimney cap flashings and other accessories to the level of the existing roof substrate.

.2 RECONSTRUCTION PHASE

.1 Framing

- .1 Repair, replace or modify existing wood studs, framing, sheathing and other underlying elements as directed by the Consultant.
- .2 Do not include this work in the base bid; Contractor to fill out Schedule of Unit Prices to determine extended amount.

.2 Pitched Roofing

- .1 Supply and install the following new components and assemblies:
 - .1 New plywood sheathing
 - .2 SA membrane over entire prepared roof substrate and up and down vertical interfacing.
 - .3 Insulation over field membrane
 - .4 Synthetic underlayment.

- .5 Standing seam metal panels and accessories
 - .6 Sheet metal flashings and accessories, including but not limited to: sheet drip flashings at all gables, rakes, and eaves back wall and side wall locations.
 - .7 Sheet metal step flashings with diversion flashings, as required to ensure water is correctly diverted into the roof gutters.
 - .8 Roof accessories as required to replace existing, including plumbing stack flashings and caps, galvanized B-vents and other roof vents.
- .3 Low Slope Roofing
- .1 Supply and install the following new components and assemblies including but not limited to:
 - .1 Plywood sheathing
 - .2 SA Membrane
 - .3 Rigid Insulation
 - .4 Crickets
 - .5 Overlay board
 - .6 TPO Membrane
 - .7 Roof framing and sheathing as indicated on the Drawings.
 - .8 Roof drains, vent housings, and plumbing stacks as required.
- .4 Sheet Metal Flashings
- .1 Supply and install new sheet metal flashings in all locations, including but not necessarily limited to:
 - .1 cap flashings,
 - .2 wall flashings,
 - .3 roof flashings,
 - .4 base-of-wall flashings, and
 - .5 all other sheet metal flashings as required by the Work.
- .5 Sealant
- .1 Supply and install sealant as required by the Work.
- .3 MOULD REMEDIATION
- .1 As necessary, undertake mould remediation in accordance with Section 02 85 00. Mould remediation is to be conducted on a time-and-materials basis; do not include cost for mould remediation in base bid.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Section Includes:
 - .1 Coordination of the Work
 - .2 Emergency Contact
 - .3 Access and Notification
 - .4 Construction Progress Documentation
 - .5 On-Site Documents
 - .6 Project Record Documents
 - .7 Meetings
 - .8 Submittals

1.2 Coordination

- .1 Coordinate progress of Work, progress schedules, submittals, use of site, temporary utilities, and construction facilities and controls.
- .2 Coordinate and supervise Work of trades and sub-trades.

1.3 Emergency Contact

- .1 Provide 24-hour emergency contact telephone number for use in event of emergency arising from Work being undertaken.
- .2 Ensure that emergency service has a maximum response time of 3 hours and can accommodate all conditions that may arise from the Work, including water damage, hoarding, security, electrical failure, gas service interruption, utility interruption, broken glass and any other related failure.
- .3 Failure to respond adequately will be cause for Owner to retain other Contractors to address this work and to deduct resultant costs from Contract price.

1.4 Access and Notification

- .1 Coordinate unit access for required interior work with Consultant prior to submitting notices or scheduling work.
- .2 Provide working schedule directly to each occupant not less than 1 week in advance of required work:
 - .1 where suite access is required, or
 - .2 when work is to be conducted on exterior walls of suite.
- .3 Provide written notice directly to occupant of each affected unit not less than 2 days in advance of required work. Place notice under door of unit and fax copy to Property Manager or Owner's Representative.
- .4 Clearly indicate on working schedule and on notice when access to suite will be required or when work will take place, expected duration, and contact number for questions and further information.

- .5 If notice has been given and then work is not to be conducted as outlined therein, provide written notice to that effect no less than 24 hours prior to originally-scheduled time.
- .6 If required working schedule and notice have both been issued and access is not provided, a stand-by charge may be issued to Owner, derived from tendered hourly rates for affected workers to a cumulative maximum of 4 hours per unit per occurrence.

1.5 Construction Progress Documentation

- .1 Schedules Required.
 - .1 Construction Progress Schedule.
 - .2 Schedule of Values of the Work
 - .3 Submittal Schedule for Shop Drawings and Samples.
- .2 Format
 - .1 Horizontal bar chart (Gantt chart), showing:
 - .1 Separate task bar for each trade or operation.
 - .2 Critical path with tasks in chronological order.
 - .3 Horizontal timescale identifying first work day of each week.
- .3 Submission
 - .1 Submit 1 copy of initial schedules to Consultant within 7 days after award of Contract.
 - .2 Consultant will review schedule and return reviewed copy within 5 days after receipt.
 - .3 Resubmit finalized schedule within 5 days after return of reviewed copy.
- .4 Working Schedules
 - .1 During progress of Work, revise and resubmit working schedules in accordance with GC 3.5.
 - .2 Submit revised working schedules on regular and ongoing basis in order to notify occupants of approximate date(s) when work may be undertaken within occupied suites or when exterior work may significantly affect interior of suite.
 - .3 Immediately notify Consultant and Owners' representative if scheduled or anticipated access dates are changed for any reason.

1.6 On-Site Documents

- .1 Maintain one copy each of the following at job site and make available for review upon request by Owner's representative or Consultant:
 - .1 Contract Documents, including Specifications and Drawings.
 - .2 Applicable building codes and building by-laws.
 - .3 Addenda, Change Orders, Change Directives, and other modifications to Contract.
 - .4 Field test reports and site visit reports.
 - .5 Copy of approved up-to-date work schedule.
 - .6 Manufacturers' installation and application instructions.

- .7 Material Safety Data Sheets (MSDS) for Products on site in accordance with "Workplace Hazardous Materials Information System" (WHMIS).
- .8 Approved Shop Drawings.
- .9 Up-to-date daily record of work performed.
- .10 Daily timesheets of Contractor's personnel.

1.7 Project Record Documents

- .1 After award of Contract, Consultant will provide set of Drawings and Specifications for purpose of maintaining project record documents ("as-builts"). Accurately and neatly record deviations from Contract Documents caused by site conditions and changes ordered by Consultant.
- .2 Maintain project record documents in as-new condition; keep clean, dry, and legible.
- .3 Provide files, racks, and secure storage for record documents and samples in field office and keep apart from documents used for construction.
- .4 Label record documents and file in accordance with Section number listings in Section 00 01 10 Table of Contents. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .5 Do not use record documents for construction purposes.
- .6 Keep record documents and samples available for inspection by Consultant.
- .7 Provide felt-tip marking pens for recording information; use separate colours for each major system.
- .8 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .9 Drawings and Shop Drawings: Legibly mark each item to record actual construction, including:
 - .1 Record locations of concealed components of mechanical and electrical services. Record all locations of rot and structural repairs.
 - .2 Keep permanent records of repairs to gas vents or vent terminations in area of Work. These records are to be noted at bottom of letter provided by Homeowner Protection Office (HPO). Forward records of these repairs to gas safety program, as well as to Owner and Consultant.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by Change Order.
 - .6 Details not on original Drawings.
 - .7 References to related Shop Drawings and modifications.
- .10 Specifications: Legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addendum and by Change Order.

- .11 Other Documents: Maintain manufacturer's certifications, inspection certifications, and field test records as required by individual Specifications sections.

1.8 Meetings

- .1 Construction Organization and Start-up:
 - .1 Within 15 days after award of Contract, request meeting of parties to Contract to discuss and resolve administrative procedures and responsibilities.
 - .2 Senior representatives of Owner, Owner's Representative, Consultant, Contractor, major subcontractors, field inspectors and supervisors must be in attendance.
 - .3 Establish time and location of meeting and notify parties concerned a minimum of 5 days before meeting.
 - .4 Incorporate mutually-agreed-upon variations to Contract Documents into Contract prior to signing.
 - .5 Agenda to include the following as required herein and as stated elsewhere in Specifications and Contract Documents:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work (progress scheduling).
 - .3 Schedule for submission of shop drawings, samples and colour chips.
 - .4 Requirements for temporary facilities, site signage, offices, storage sheds, utilities and fences.
 - .5 Delivery schedule of specified equipment, materials and products.
 - .6 Site security.
 - .7 Proposed changes, Change Orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements (GC).
 - .8 Owner-provided Products.
 - .9 Record drawings.
 - .10 Maintenance information.
 - .11 Take-over procedures, acceptance, and warranties.
 - .12 Progress claims, administrative procedures, photographs, and holdbacks (GC).
 - .13 Appointment of inspection and testing agencies or firms, if required.
 - .14 Insurances and transcript of policies (GC).
 - .6 Comply with Owner's and Consultant's allocation of mobilization areas of site; for field offices and sheds, access, traffic, and parking facilities.
 - .7 During construction, coordinate use of site and facilities through Consultant's procedures for intra-project communications: Submittals, reports and records, schedules, coordination of drawings, recommendations, and resolution of ambiguities and conflicts.
- .2 Project Meetings
 - .1 Hold and preside at bi-weekly project meetings during progress of Work.
 - .2 Record minutes, including significant proceedings and decisions and identifying action by parties.
 - .3 Agenda to include the following:

- .1 Review and approval of previous meeting minutes.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems that may impede construction schedule.
 - .5 Review of off-site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
- .4 Produce copies of minutes within 3 days after each meeting and distribute to meeting participants, affected parties not in attendance, Consultant and Owner's Representative.

1.9 Submittals

- .1 Provide submittals in accordance with requirements of GC 3.10 SHOP DRAWINGS.
- .2 Accompany submittals with filled-out Submittal Transmittal Form as included in Section 00 62 11.
- .3 Do not proceed with work affected by submittal until review is completed and Consultant's approval has been received in writing.
- .4 Shop Drawings: Submit 2 copies of Shop Drawings as required and as Consultant may reasonably request.
- .5 Samples
 - .1 Submit samples to Consultant for review as requested in respective specifications sections.
 - .2 Keep samples available at the project site office and make available for Consultant review.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Section Includes: Regulatory requirements, quality assurance, and quality control requirements for the Project.

1.2 General

- .1 Immediately notify Consultant if required Work is such as to make it impractical to produce required results.
- .2 Decisions as to quality or fitness of workmanship in cases of dispute rest solely with Consultant, whose decision is final.
- .3 Remove and make good defective work at own expense and be responsible for delays and expenses resulting from rejection of work.

1.3 Regulatory Requirements

- .1 Conduct Work in accordance with the most recent edition of applicable building codes / building by-laws, and with the requirements of authorities having jurisdiction (AHJs).
- .2 Comply with Workers' Compensation Board / WorkSafe BC requirements and applicable regulations.
- .3 Except where indicated otherwise, where reference is made to a specification, code or standard, comply with the latest edition of the specification, code, or standard (as amended) in effect as of the date of the Contract.

1.4 Quality Assurance

- .1 Labour and Supervision
 - .1 Maintain person responsible for coordination and supervision on site at all times during the Work.
 - .2 Only skilled tradespersons specialized in the work of the applicable section, officially employed by a contractor, and operating adequate and necessary equipment will be authorized to perform Work.
 - .3 Do not employ any unfit person or anyone unskilled in their required duties.
- .2 Products and Materials
 - .1 Provide only Products that are not damaged or defective, that comply with specified requirements, and that are suitable for the purpose(s) intended. If requested, furnish evidence as to type, source and quality of Products provided.
 - .2 Defective Products will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error.
 - .3 If dispute should arise as to quality or fitness of Products, decision rests strictly with Consultant, based upon requirements of Contract Documents.

- .4 Delivery, Storage and Handling of Products
 - .1 Handle and store products in accordance with manufacturer's instructions, taking care to prevent damage, deterioration, or soiling.
 - .2 Deliver, handle and store products in original wrappings and containers, with manufacturer's seals and labels intact.
 - .3 For products that have a defined shelf life, use prior to manufacturer's "use by" date, as marked on product packaging.
 - .4 Store products susceptible to weather damage in weatherproof enclosures.
 - .5 Avoid prolonged exposure of light- and heat-sensitive materials to sunlight.
 - .6 Store combustible materials away from heat and open flame.
 - .7 Consult manufacturer's material safety data sheets (MSDS) to determine special considerations applicable to appropriate and safe handling of each Product.
- .5 Manufacturer's Instructions
 - .1 Unless otherwise specified, install products in accordance with manufacturer's instructions.
 - .2 Do not rely on labels or enclosed literature provided with products. Obtain written instructions directly from manufacturer.
 - .3 Notify Consultant in writing of conflicts between Specifications and manufacturer's instructions so Consultant may determine appropriate course of action.
 - .4 Improper installation or erection of Products resulting from failure to comply with these requirements authorizes Consultant to require removal and reinstallation at no increase in Contract price.
- .3 Contractor's Equipment
 - .1 Equipment, tools and supplies brought on site and assigned to Work are to be thoroughly cleaned, free of defects, and suitable for purpose(s) for which they are intended.
- .4 Mock-Ups
 - .1 Mock-ups are used to judge workmanship and substrate preparation against standard of quality required. Completed mock-ups of sufficient workmanship may be included in finished Work.
 - .2 Provide mock-ups for all aspects of Work for review by Consultant prior to full installation of a Product or material.
 - .3 Undertake Work of each section in a small, representative area and call Consultant for review before proceeding with Work on a larger scale.
 - .4 Upon review, Consultant will promptly forward written confirmation accepting or rejecting reviewed Work, noting reasons for acceptance or rejection.
 - .5 Do not proceed with Work on a larger scale without approval in writing from Consultant.

1.5 Quality Control

- .1 Field Review and Inspection of Work:
 - .1 Defective Work shall be rejected, regardless of previous inspections. Inspection does not relieve Contractor of responsibility, but is precaution against oversight or error.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Section Includes:
 - .1 Temporary utilities.
 - .2 Construction facilities.
 - .3 Construction aids.
 - .4 Access and parking.
 - .5 Protection
 - .6 Security

1.2 Installation and Removal

- .1 Provide construction facilities and temporary controls required in order to execute the Work described in the Contract Documents.
- .2 Remove from site all such work after use and make good all areas.

1.3 Temporary Utilities

- .1 Temporary Power
 - .1 Provide for temporary power for temporary lighting and operating of power tools during construction to a maximum supply of 230 volts 30 amps.
 - .2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
 - .3 Owner will pay utility charge at prevailing rates.
- .2 Water Supply
 - .1 Owner will provide a continuous supply of potable water for construction use.
 - .2 If required, arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.

1.4 Construction Facilities

- .1 Sanitary Facilities
 - .1 Provide sufficient sanitary facilities for workers in accordance with requirements of local health authorities.
 - .2 Maintain sanitary facilities in clean condition.
 - .3 Locate portable toilets in suitable location away from suites to protect occupants from unpleasant odours. Obtain Owner approval before locating toilets.
- .2 Site Storage / Loading
 - .1 Confine Work and operations of employees to area(s) of Work indicated by Contract Documents. Do not unreasonably encumber premises with Products, materials, facilities or workers.

- .2 Do not load or permit to be loaded any part of the Work with weight or force that will endanger the Work.
- .3 Equipment / Tool / Materials Storage
 - .1 Provide secure, lockable weatherproof storage for tools, equipment and materials. Maintain in clean and orderly condition.
 - .2 Locate materials that do not require weatherproof storage in a manner that will cause least amount of interference with work activities.
 - .3 A portion of the parking garage will be made available for site storage as indicated on Drawings. Lay-down areas will be identified during pre-bid site meeting.
 - .4 Do not unnecessarily store materials tools or equipment on roof areas.

1.5 Construction Aids

- .1 Scaffolding
 - .1 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, temporary stairs, hoists and other related items required to access and execute Work. Refer to Section 01 54 23 Temporary Scaffolding and Platforms.
- .2 Electrical Equipment
 - .1 Electrical equipment used on this project must be protected with ground fault interrupters.

1.6 Access and Parking

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as required for access to Work.
- .2 Provide and maintain signal flag operators, traffic signals, barricades and flares, and lights or lanterns as required to perform Work and to protect public.
- .3 If authorized to use existing roads and parking areas for access to project site, maintain such areas for duration of Contract and make good damage resulting from such use.
- .4 Maintain access to property, including overhead clearances for use by emergency response vehicles.
- .5 Parking: Limited space is available for parking on site. Available parking will be identified during pre-bid site meeting.
- .6 Clean areas where used by Contractor's equipment.

1.7 Protection

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Protect adjacent work, materials and surfaces from splash, spray, spillage and water ingress. Provide protection for finished and partially finished building assemblies, finishes and equipment during performance of Work.
- .3 Ensure Work is adequately protected at the end of each working day and during any interruption of work.

- .4 At all times, protect interiors from weather and exterior elements. Have on site all necessary tarpaulins, polyethylene or other suitable waterproofing materials to provide required protection.
- .5 Provide appropriate protection to building and ground areas through or over which materials are being transported.
- .6 Provide necessary screens, covers, and hoardings.
- .7 Be responsible for damage incurred due to lack of or improper protection.
- .8 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.
- .9 Provide secure, rigid guardrails and barricades around open shafts, open stair wells, open edges of floors and roofs, and elsewhere as required to protect public and workers and as required by local regulations.
- .10 Hoarding and Weather Enclosures
 - .1 Erect hoarding to protect public, workers, and public or private property from injury or damage in accordance with Section 01 54 23 Temporary Scaffolding and Platforms.
 - .2 Erect weather enclosures to protect Work from weather in accordance with Section 01 54 23 Temporary Scaffolding and Platforms.

1.8 Security

- .1 Provide security fencing as required to reasonably ensure safety and security of occupants during working and non-working hours.
- .2 Provide exterior motion lighting for areas affected by Work. Position motion lighting in suitable number of locations to provide adequate security coverage of all areas.
- .3 Take reasonable precaution to prevent unauthorized access to work areas and interior of building at all times when on site and when off site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Section Includes:
 - .1 Design, supply, erection, and maintenance of scaffolding to facilitate restoration work, including bracing, tie-backs, outriggers, guardrails, toe boards, platforms, access stairs and ladders.
 - .2 Design, supply, erection and maintenance of hoarding to protect public, workers, and public and private property from injury or damage.
 - .3 Weather-tight enclosures for scaffolding, as required.
 - .4 Performance of daily scaffolding safety inspections throughout construction and maintaining safety of workers and pedestrians.

1.2 References

- .1 Applicable Building Codes / Building By-Laws, most recent edition.
- .2 CAN/CSA-S269.2 *Access Scaffolding for Construction Purposes*.
- .3 CAN/CSA-Z271 *Safety Code for Suspended Elevating Platforms*.
- .4 *Workers' Compensation Act* [RSBC 1996] and *Workers' Compensation Amendment Act* (2002).
- .5 *Occupational Health and Safety Regulation* of British Columbia.

1.3 Definitions

- .1 The term **scaffolding**, when used by itself, generically refers to both stationary and suspended (swing stage) scaffolding systems.

1.4 Design Requirements

- .1 Scaffolding to be designed in compliance with requirements of referenced standards and codes.
- .2 Structural Support:
 - .1 Verify bearing condition of soil and supporting structure.
 - .2 Where existing structure is to be used for structural support of scaffolding, verify that existing structure can safely support resultant imposed loads. Should existing structure require strengthening for support of scaffolding, provide details from professional engineer for shoring or strengthening requirements.
 - .3 When relying on structural integrity of existing exterior building walls for lateral support of scaffolding, establish whether existing wall components can adequately support additional lateral loads. Provide adequate anchorage of lateral supports for scaffolding and restore existing wall to original condition after removal of scaffolding anchorage.
- .3 Enclosure
 - .1 When required, equip scaffolding with enclosure capable of providing protection to pedestrians and adjacent property from dust, dirt, debris, water spray, falling tools and materials, and any other related workplace hazards.

- .2 Design and construct enclosed scaffolding and weather enclosures to withstand wind pressure / wind loads and snow loads.
- .4 Access to Stationary Scaffolding
 - .1 Provide stairs or fixed vertical ladders to access all working levels of stationary scaffolding.
 - .2 Equip stairs and landings with handrails/railings such that if a worker trips and falls while descending stairs, it will not be possible for worker to fall through railing system.
 - .3 Surround stair openings on planked working areas of stationary scaffolding by railings to prevent workers from walking into back or sides of open stair.
- .5 Working Platforms
 - .1 Ensure that levels of scaffolding designated for work are fully planked. Do not remove isolated areas of planking on fully-planked working platforms. Replace damaged planks immediately.
 - .2 If fully-planked working platforms are not required or a partially-planked platform is required to facilitate lowering or raising material, install guardrails to prevent workers from falling off partially-planked platform.
 - .3 With exception of front of stair openings, ensure all openings in working platforms are equipped with railings to prevent workers from accidentally walking into openings.
- .6 Suspended Scaffolding
 - .1 Suspended scaffolding cannot be moved up or down if scaffold work platforms are more than 10% out of level.
 - .2 Suspended platforms are to be operated with power units equipped with positive pressure controls (i.e., dead-man switch and positive drives for raising and lowering scaffold).
 - .3 Parapet clamps are not permitted. Support of suspended scaffolding is to be independent of building parapet.

1.5 Submittals

- .1 Prior to erecting scaffolding, prepare and submit erection drawing and connection details for review by Consultant. Drawings are to be stamped by professional engineer (with experience in the structural design of scaffolding) registered in the Province of British Columbia. Consultant's review does not relieve Contractor from any contractual requirement or responsibility.
- .2 Erection drawings are to include:
 - .1 Reference specifications, materials and sizes for structural members.
 - .2 Main dimensions of scaffolding.
 - .3 Locations of tiebacks and bracing.
 - .4 Guardrails.
 - .5 Planking.
 - .6 Stairs.
 - .7 Ladders.
 - .8 Where necessary, shoring or strengthening of existing structures.
 - .9 Connection details.

- .10 Support details for suspended scaffolding.
- .11 Tieback arrangement for suspended scaffolding.
- .12 Counterweight arrangement and outrigger design for suspended scaffolding.
- .3 Submit copies of WorkSafeBC inspection reports, orders to comply, or other instructions/correspondence to Consultant and professional engineer responsible for certifying scaffolding erection drawings and confirming that scaffolding is erected in accordance with reviewed erection drawings. Immediately follow any WorkSafeBC life safety instructions/work orders prior to continuing with Work.

1.6 Certifications

- .1 After scaffolding is erected, provide written certification from professional engineer that scaffolding is erected in accordance with reviewed erection drawings.
- .2 Report revisions to lateral and gravity support arrangements for suspended scaffolding to professional engineer who certified erection drawings. In addition, obtain certification from professional engineer that revisions have been reviewed and are acceptable.
- .3 For stationary scaffolding erected over underground parking garage structures, obtain written certification from professional engineer that parking garage structure can support imposed loads.

PART 2 - PRODUCTS

2.1 Scaffolding Components

- .1 Obtain metal scaffolding components from a single source (supplier) for metal scaffolding components.
- .2 Obtain test data and test information from supplier; submit to Consultant upon request.

2.2 Hoarding and Enclosures

- .1 Provide posts, rafters, planking and plywood sheathing as required.
- .2 Construct roof structure of hoarding with wood framing capable of withstanding impact load from falling debris, materials, or tools in order to provide overhead protection to persons accessing building during construction. Ensure roof of hoarding is waterproof.
- .3 Use white-coloured tarps where enclosures will block daylight to occupied units.

PART 3 - EXECUTION

3.1 Preparation

- .1 Prepare surfaces in accordance with manufacturer's directions.

3.2 Erection

- .1 Erect scaffolding in accordance with erection drawings and in compliance with requirements of referenced standards and codes.

- .2 Position scaffold tiebacks in line with through-wall flashing, if possible. Install self-adhesive membrane on top of sheathing paper at locations where there are scaffold tiebacks penetrating sheathing paper. Seal membrane penetrations with mastic at time of tieback removal.

3.3 Suspended Scaffolding

- .1 Operate suspended scaffolding in accordance with rules and regulations set out in referenced standards.
- .2 Erect and operate commercially-manufactured suspended scaffolds in accordance with written operating procedures developed by manufacturer and in accordance with professional engineer's design, including instructions on erection, use and design.
- .3 When not in use, lash suspended scaffolding to structure or lower suspended scaffolding to ground and secure. Secure suspension lines and safety ropes to prevent damage.
- .4 Persons entering or exiting suspended scaffolding and persons working on or from suspended scaffolding must use a fall arrest system, including lifeline and rope grip.
- .5 Barricade area below suspended scaffolding or provide means of overhead protection, such as personal net or debris net. Post highly-visible warning signs to notify public of potential hazard overhead.
- .6 Protect supporting components of suspended scaffolding, such as suspension lines, tie-backs, lifelines and any other component made of rope, from damage by corrosion, abrasion, foreign materials, heat, or work activities that might damage rope or internal hoist mechanism.

3.4 Hoarding

- .1 Make all effort to reduce impact of hoarding on occupants and to minimize duration of hoarding in any one location any longer than is necessary to complete work.
- .2 Provide hoarding in accordance with rules and regulations set forth in referenced standards.
- .3 Provide hoarding protection at areas identified as being in scope of work.
- .4 If necessary, provide sufficient lighting for evening building entry and exit throughout covered walkways to ensure public safety and security. No dark corners are allowed.
- .5 Maintain hoarding in good condition at all times.
- .6 Repair damaged hoarding to satisfaction of Consultant and other applicable authorities.
- .7 Maintain environmental conditions, including temperature, within hoarding to allow for continuous work.
- .8 Keep hoarding clean at all times.
- .9 Remove hoarding from site only when authorized by Consultant.

3.5 Inspection

- .1 Perform daily safety inspection of scaffolding throughout construction. Repair or replace components as necessary to ensure continued safety of workers and public.

3.6 Repair / Restoration

- .1 Make good all damage to existing building caused by erection and dismantling of scaffolding and by loads imposed by scaffolding.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Section Includes: Requirements for incidental cutting, fitting, and patching required to complete the Work or to make its many parts fit together properly.
- .2 Related Sections:
 - .1 01 00 00 General Requirements.
 - .2 01 10 00 Summary of Work.
 - .3 01 31 00 Project Management and Coordination

1.2 Submittals

- .1 Submit written request in advance of cutting or alteration that affects:
 - .1 Structural integrity of any element of Project.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of any operational element.
 - .4 Visual qualities of sight-exposed elements.
 - .5 Work of Owner or separate contractor.
- .2 Include in request:
 - .1 Identification of Project.
 - .2 Location and description of affected Work.
 - .3 Statement on necessity for cutting or alteration.
 - .4 Description of proposed Work and Products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Effect on Work of Owner or separate contractor.
 - .7 Written permission of affected separate contractor.
 - .8 Date and time work will be executed.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.1 Examination

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning cutting or patching means acceptance of existing conditions.

3.2 Preparation

- .1 Provide supports to ensure structural integrity of surroundings; provide devices and methods to protect other portions of Project from damage.
- .2 Provide protection from elements for areas that may be exposed by uncovering work; maintain excavations free of water.

3.3 Execution

- .1 Execute cutting, fitting, and patching to complete Work.
- .2 Fit several parts together to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
- .6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .7 Perform cutting and patching for weather-exposed and moisture-resistant elements and for sight-exposed surfaces.
- .8 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools are not allowed.
- .9 Restore Work with new Products in accordance with requirements of Contract Documents.
- .10 Fit Work air- and water-tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .11 At penetration of fire-rated wall, ceiling, or floor construction, completely seal voids with firestopping material(s) of thickness and composition appropriate to maintaining fire rating.
- .12 Refinish surfaces to match adjacent finishes: For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.
- .13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Section Includes:
 - .1 Administrative procedures preceding preliminary, substantial and final inspections of Work.
 - .2 Payment of holdback.
 - .3 Close-out submittals.
 - .4 Final cleaning.

1.2 Inspection

- .1 Contractor's Inspection
 - .1 Contractor and all Subcontractors shall conduct an inspection of Work, and prepare and submit a valued list of deficiencies and defects to the Consultant.
 - .2 Notify Consultant in writing of satisfactory completion of Contractor's Inspection and request Consultant's inspection to establish Substantial Performance of the Work.
- .2 Consultant's Inspection
 - .1 Consultant and Contractor will perform inspection of Work to identify obvious defects or deficiencies.
 - .2 When it appears requirements of Contract have been substantially performed, Consultant will establish date of Substantial Performance of Work.
 - .3 Warranty periods to commence as of date stated on submitted Certificate of Substantial Performance.
- .3 Completion: Submit written certificate confirming that:
 - .1 Work has been completed and inspected for compliance with Contract Documents.
 - .2 Defects have been corrected and deficiencies have been completed.
 - .3 Any Certificates required by authorities having jurisdiction have been submitted.
 - .4 Work is complete and ready for Final Inspection.
- .4 Final Inspection: When items noted above are completed, request final inspection of Work by Consultant. If work is deemed incomplete by Consultant, complete outstanding items and request reinspection.

1.3 Payment of Holdback

- .1 After issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount.

1.4 Close-out Submittals

- .1 On completion of Work and prior to final inspection, submit closeout submittals to Consultant as follows:
 - .1 Project Record Documents



- .1 Submit 3 final comb-bound copies as outlined in Section 01 31 00 Project Management and Coordination.
 - .2 Separate each record set with index tab sheets keyed to Table of Contents listing.
 - .3 Bind Drawings in with Specifications; fold larger drawings to size of specifications pages.
- .2 Operation, Maintenance and Warranty Information
 - .1 Submit 3 final comb-bound copies.
 - .2 Format:
 - .1 Include "Operation, Maintenance and Warranty Information" title page listing:
 - .1 Project Title and Address
 - .2 Contractor Name and Address
 - .3 Date of issue
 - .2 Include Table of Contents naming project and identifying all sections.
 - .3 Organize with tabbed pages dividing sections.
 - .3 Contents:
 - .1 Contact Information
 - .1 Date of submission; names, addresses, and telephone numbers of Consultant and Contractor with names of responsible parties;
 - .2 For each product or system, list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
 - .2 Products / Materials / Systems Information:
 - .1 Include inventory list of maintenance materials.
 - .2 Separate each product, material and system with index tab sheets keyed to Table of Contents listing.
 - .3 Manufacturer's printed data, including information on technical specifications, care, maintenance, and cleaning.
 - .4 Product Data: mark each sheet to clearly identify specific products and component parts and data applicable to installation. Delete inapplicable information.
 - .5 Add typewritten text as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
 - .6 Building Products, Materials, and Finishes: include product data with catalogue numbers, sizes, composition, and colour and texture designations. Provide re-ordering information for Products and materials.
 - .7 Cleaning Instructions: cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
 - .8 Additional Requirements: as specified in individual Specifications sections.
 - .3 Warranties and Bonds
 - .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 Warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers.
- .4 Except for items put into use with Owner's permission, leave warranty start date until Date of Substantial Performance is determined.
- .5 Verify that documents are in proper form, contain full information, and are notarized.
- .6 Co execute submittals when required.
- .7 Additional information and requirements outlined in Section 01 78 36 Warranties.

.3 Maintenance Materials

- .1 Provide maintenance and extra materials in quantities specified in individual Specifications sections.
- .2 Ensure maintenance materials provided are new, undamaged or defective, and of same quality and manufacture as Products provided as part of Work.
- .3 If requested, furnish evidence as to type, source and quality of Products provided.
- .4 Deliver to site; place and store.
- .5 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings with Maintenance Information.

1.5 Final Cleaning

- .1 Refer to GC 3.14.
- .2 Prior to final review, remove surplus Products, tools, construction machinery and equipment.
- .3 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site unless approved by Consultant.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Clean all glass in areas of Work.

1.6 Final Payment

- .1 When Owner or Consultant considers final deficiencies and defects to have been corrected and it appears that all requirements of Contract have been totally performed, make application for final payment.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Section Includes:
 - .1 Requirements and obligations with respect to provision of Warranties to Owner for Work covered under this Contract.

1.2 Roofing Systems Warranties

- .1 RCABC Warranty
 - .1 Warranty: Upon completion of the Contract, provide a RCABC 5-Year Labour and Material Warranty for the full value of the roofing contract stating that the roofing system will remain leak-proof for a 5-year period, starting from the date of Substantial Performance, and that all deficient waterproof membrane and components will be replaced at no cost to the Owner. Coordinate and pay for all inspection costs directly; include inspection costs in the base bid.
- .2 Roofing Manufacturer Warranty
 - .1 Manufacturer Warranty: Upon completion of the Contract and in addition to the RCABC Warranty, provide 20-Year Limited Material warranty furnished by the Manufacturer, stating that the roofing system is free of manufacturing defects and will remain leak-proof for a 20-year period, starting from the date of Substantial Performance, and that all deficient roofing system components will be replaced at no cost to the Owner. This warranty is subject to the conditions and limitations of the manufacturer's standard exclusions. Include any cost attached to placing the Warranty in the Contract Price. Submit a sample of Warranty to the Owner for the system proposed upon notification of award of Contract.
- .3 Roofing Contractor Warranty
 - .1 Materials and Labour Warranty
 - .1 Provide, for the benefit of the Owner, a Contractor warranty covering defects in materials and labour used in roofing systems.
 - .2 The limit on claims under the Contractor's materials and labour warranty shall not be less than 100% of the total cost of the replaced roof area covered by the warranty.
 - .3 Roofing materials and labour warranty coverage shall remain in effect for a period of 5 years after the date on which the building envelope renovation was substantially complete.
 - .4 Include all costs, including any re-inspection, fees associated with this warranty

1.3 Contractor Warranty

- .1 Materials and Labour Warranty
 - .1 Provide for benefit of Owner a Contractor warranty covering defects in materials and labour used on Project.
 - .2 Materials and labour warranty coverage to remain in effect for a period of 2 years after date of Substantial Performance of the Work.
 - .3 Provide materials and labour warranty coverage for Work performed under this Contract.

- .4 Pay costs associated with this warranty, including re-inspection fees.
- .5 Provide water penetration warranty coverage for Work performed under this Contract.
- .6 Pay costs associated with this warranty, including re-inspection fees.

1.4 Product and Subcontractor Warranties

- .1 Secure such warranties or guarantees as may be available from subcontractors, Product manufacturers and suppliers, and which may extend past termination of other specified warranty periods.
- .2 Warranties to be fully transferable and to benefit of Owner.
- .3 Deliver originals plus 2 copies of such warranties or guarantees to Consultant.
- .4 Submittals to accompany request for Substantial Performance of the Work.
- .5 Secure warranties as specified within Contract Documents and individual Specifications sections.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Section includes, but is not necessarily limited to removal of:
 - .1 Pitched and Low Slope Roof Assemblies.
 - .2 Other interior finishes and deteriorated building components.

1.2 References

- .1 CSA-S350 *Code of Practice for Safety in Demolition of Structures*.

1.3 Delivery, Storage and Handling

- .1 Carefully set aside and protect items to be reused.
- .2 Safety:
 - .1 Comply with safety requirements of applicable building code / building by-law, most recent edition.
 - .2 At end of each day's work, leave Work in safe condition so that no part is in danger of toppling or falling.
- .3 Waste Management and Disposal: Dispose of demolished materials in accordance with requirements of authorities having jurisdiction. Recycle waste wherever possible.

1.4 Existing Conditions

- .1 Take over structures to be demolished based on their condition at time construction Contract is signed.

1.5 Protection

- .1 Prevent movement, settlement, or other damage to adjacent structures, utilities, walks, paving, trees, landscaping adjacent grades, and parts of building to remain in place. Provide bracing and shoring as required.
- .2 Prevent blockage of surface drainage, elevators, and mechanical and electrical systems that must remain in operation.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

3.1 Examination

- .1 Examine area and report existing damage in writing to the Consultant prior to commencing demolition work. Commencement of demolition indicates acceptance of condition. Unreported damage is the responsibility of the Contractor to repair or make good.

3.2 Preparation

- .1 Do not disrupt active or energized utilities designated to remain undisturbed.
- .2 Prior to the removal of sheathing, ensure saw depth is set to avoid damaging framing members.
- .3 Prior to demolition, become familiar with the locations of wiring and plumbing hidden from view.
- .4 Remove existing equipment, services and obstacles as necessary to conduct the work, and reinstate as the work progresses.

3.3 Demolition

- .1 Demolish items as indicated on Drawings and in Section 00 10 00 Summary of Work.
- .2 Remove and demolish materials by saw cutting, except as noted. Pneumatic or impact tools are not to be used for demolition unless stated otherwise. Minimize hammering and pounding.
- .3 Examine interior cavities and affected surfaces for deterioration, damage, or rot. Notify Consultant of locations and extent of damage.
- .4 Remove and dispose of deteriorated building components, including wet insulation, sheathing, structural members, interior drywall, vapour barrier, and any other component as directed by the Consultant.
- .5 Demolish to minimize production of dust. Keep dusty materials wetted.
- .6 Replace scored sheathing that occurs as a result of removing existing cladding in areas where sheathing is not being removed and replaced.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 This section outlines procedures, facilities and materials associated with remediation of mould-contaminated materials, including, but not limited to:
 - .1 Removal and disposal of mould-contaminated materials marked for removal.
 - .2 Surface cleaning of mould-contaminated materials.
 - .3 Erection and maintenance of critical barrier where required.

1.2 Definitions

- .1 **Toxicogenic:** Substance or biological entity that has the property itself or can produce one or more compounds that have the property to harm humans or other animals.
- .2 **Pathogenic:** An organism (pathogen) is described as pathogenic when it is able to induce disease in another organism (host).
- .3 **High-Risk Individuals:** Infants (younger than 12 months old), persons having undergone recent surgery, immune suppressed people, and people with chronic inflammatory lung diseases (e.g., asthma, hypersensitivity pneumonitis, and severe allergies).

1.3 References

- .1 *WorkSafeBC Occupational Health and Safety (OHS) Regulation (B.C. 296/97)*, including regulations for construction projects and Part 4 Guidelines, as amended.
- .2 *WorkSafeBC Prevention Manual*
- .3 *ASHRAE.62 Ventilation for Acceptable Indoor Air Quality.*
- .4 British Columbia Ministry of Environment
 - .1 *Environmental Management Act*
 - .2 *Transportation of Dangerous Goods Regulation*
 - .3 *Hazardous Waste Regulation*
- .5 *Guidelines on Assessment and Remediation of Fungi in Indoor Environments* (New York City Department of Health, 2000). Refer to <http://www.nyc.gov/html/doh/html/epi/mouldrpt1.shtml> for the contents of the guideline.
- .6 *Mould Remediation in Schools and Commercial Buildings*, U.S. Environmental Protection Agency (EPA), EPA 402-K-01-001, March 2001.

1.4 Construction Safety and Security

- .1 Comply with requirements of applicable building code / building by-law, most recent edition, and with requirements of authorities having jurisdiction.
- .2 Supply of personal protective equipment is considered part of standard Contractor equipment requirements, and will not be considered an additional expense.

1.5 Environmental Requirements

- .1 Consultant has right to call for a cease to all work during inclement weather that may affect operation of containment area.
- .2 The Owner, at its own discretion and expense, may undertake:
 - .1 Smoke testing to confirm positive pressure difference across critical barrier.
 - .2 Interior air quality testing for airborne mould spores.

1.6 Health and Safety

- .1 Many mould species can cause allergic reactions in some individuals and a number of species are known to be *toxigenic* or *pathogenic*. *Stachybotrys chartarum* (SC) and other *toxigenic* moulds are likely to be present in this building.
- .2 Take all necessary precautions to prevent spread of contaminated materials and to protect all parties, including general public, from contaminant exposure during course of Work.
- .3 Post site safety requirements on site in conspicuous location; include usage and decontamination procedures.
- .4 Failure to comply with site health and safety requirements may result in removal of offending person(s) from site at Consultant's or Owner's request.
- .5 For remedial work, use only personnel trained in proper handling of hazardous materials, including clean-up procedures and personal protection, and who have full comprehension of potential health hazards.
- .6 Personnel involved in mould remediation are to wear appropriate respiratory protection, disposable coveralls, goggles, and gloves, as described in PART 2 PRODUCTS.
- .7 Each person working in contaminated areas must sign an acknowledgment letter stating that they have received and understand the medical warning and requirements for personal protection and decontamination. Where requested, provide copies of signed acknowledgement letters to Consultant.
- .8 Keep minimum of 1 multipurpose dry chemical fire extinguisher within the containment enclosure and accessible by workers throughout duration of remediation work.

1.7 Visitor Protection

- .1 Authorized Visitors: Consultant's representatives, persons representing authorities having jurisdiction or regulatory agencies, Owner, and Owner's Representatives.
- .2 Provide appropriate coveralls, goggles and gloves to authorized visitors. Authorized visitors are responsible for their own respiratory protection.
- .3 Allow authorized visitors unrestricted use of site facilities.
- .4 Authorized visitors are required to comply with protection procedures in accordance with requirements of this section.

PART 2 - PRODUCTS

2.1 Acceptable Materials and Equipment

- .1 Powered Air Purifying Respirator (PAPR): Full-face style, fitted with high-efficiency filters.
- .2 Full-Facepiece Respirator: Negative-pressure respirator with dual cartridge system of high-efficiency particulate filters. Recommended for use during mould removals and cleaning of mould-contaminated surfaces.
- .3 Half-Facepiece Respirator: Negative-pressure half-facepiece respirator fitted with N95 or high-efficiency particulate filters. This is the minimum protection required for mould removal and cleaning of mould-contaminated surfaces.
- .4 Disposable Coveralls: Dust-resistant full-body coveralls with attached hood. Elasticized at wrists and cuffs. Acceptable products:
 - .1 Tyvek coveralls
 - .2 Kappler Pro/Shield 2
- .5 Gloves: Latex or nitrile gloves under work gloves for dismantling, demolition and cleaning work.
- .6 Goggles: Use protective eyewear when using half-facepiece respirators.
- .7 HEPA Vacuum Cleaner: Vacuum cleaner fitted with high-efficiency particulate air filter, with appropriate tools and hoses.
- .8 Plastic Sheeting Materials:
 - .1 Use new materials only.
 - .2 Rip-Proof Polyethylene Sheeting: Fibre-reinforced, 8-mil fabric made from 5-mil weave and 2 layers 1.5-mil poly laminate. Use full sheets where possible to minimize on-site seams and overlaps.
 - .3 Polyethylene Sheeting: Minimum 6 mils thickness. Use full sheets where possible to minimize on-site seams and overlaps.
- .9 Waste Bags: Sealable bags, 6 mils thickness, suitably sized for containment of debris.
- .10 Sprayer: Hand-operated sprayer (garden type) equipped with wand capable of providing spray or stream of wetting or cleaning solution. Hand spray applicator may be used for small areas.
- .11 Negative Pressure Unit: Exhaust fans with HEPA filtration used to maintain negative pressure in work area relative to adjacent areas.
- .12 Disposal Bin: Metal, lockable, fully-enclosed container suitable for placement of waste generated during work and of sufficient size to minimize number of loads.
- .13 Tape: Reinforced duct tape suitable for sealing polyethylene under wet and dry conditions.
- .14 Wood: No. 2 Grade lumber northern softwood species, in accordance with *Standard Grading Rules for Canadian Lumber* issued by National Lumber Grading Authority (NLGA).
- .15 Gypsum Board: Fire-rated gypsum board, as approved by Underwriters' Laboratories of Canada (ULC); minimum 1/2 inch thickness unless otherwise specified,

- .16 Marker Paint: Provide can of spray paint on site for Consultant to mark locations for remediation.

PART 3 - EXECUTION

3.1 Preparation

- .1 Do not undertake remedial work unless site is secure and all required materials and equipment are on site and ready for use.
- .2 Clear areas to be remediated of furniture and other obstructions prior to beginning remediation work.
- .3 Request list from Consultant of units or areas occupied by high-risk individuals.
- .4 Remove existing cladding, sheathing membrane and sheathing. Leave existing framing members intact. Call for review by Consultant.
- .5 Consultant will examine framing members for mould and will identify with marker paint areas that require mould remediation.

3.2 General Remediation Requirements

- .1 Use dust suppression methods, such as misting (not soaking) surfaces prior to remediation, and use general work practices that minimize generation of dust.
- .2 Remove mould-infected absorbent materials to a minimum distance of 300 mm beyond area of visible mould growth.
- .3 Clean contaminated materials and surfaces that are not to be removed as follows:
 - .1 HEPA vacuum.
 - .2 Mist with water/detergent to minimize disturbance/generation of dust.
 - .3 Wash and scrub to remove as much of visible stain as possible.
 - .4 Dry rapidly and thoroughly.
 - .5 HEPA vacuum.
- .4 After removal of all contaminated absorbent materials and other finishes or components, HEPA vacuum and wash with detergent-and-water solution all surfaces and facilities within work area that show no visible signs of mould contamination.
- .5 Do not transport contaminated materials through uncontaminated areas without first establishing isolated route. Contaminated materials to be removed through interior spaces must be contained in sealed waste bags.
- .6 Remove used protective equipment, remove and bag coveralls, gloves, and goggles, and wash used respirators with detergent-and-water solution prior to entering uncontaminated areas. Store non-disposable coveralls and gloves in sealed plastic bags prior to removal from site.
- .7 Thoroughly HEPA vacuum and wet wipe equipment and other items to be removed from work area for use at another site.

3.3 Mould Removal from Exterior

- .1 Erect and maintain protective barrier at interior of units occupied by high-risk individuals as directed by Consultant. Locations to be determined following removal of cladding, sheathing membrane and sheathing to determine extent of mould growth.
- .2 Temporarily seal exterior openings (i.e. windows and doors) affected by mould remediation to prevent airborne contamination from entering interior.

3.4 Mould Removal from Interior

- .1 Small Areas: up to 10 square feet:
 - .1 Work area should be unoccupied. Vacating people from spaces adjacent to work area is not necessary, but is recommended for *high-risk individuals*.
- .2 Large Areas: over 10 and up to 100 square feet:
 - .1 Work area and areas directly adjacent should be unoccupied. Vacating people from spaces adjacent to work area is not necessary, but is recommended for *high-risk individuals*.
 - .2 Before remediation, cover Work area and areas directly adjacent with plastic sheeting and tape to contain dust/debris. Seal ventilation ducts/grills in work area and areas directly adjacent with plastic sheeting.
- .3 Extensive Areas: over 100 square feet:
 - .1 Full-face respirators, gloves, protective coveralls with hood, and shoe covers are mandatory.
 - .2 Work area must be unoccupied. Vacating people from spaces adjacent to work area is not necessary, but is recommended for *high-risk individuals*.
 - .3 Containment of affected area:
 - .1 Completely isolate work area from occupied spaces using plastic sheeting sealed with tape (including ventilation ducts/grills, fixtures, and other openings). Provide decontamination room.
 - .2 Use exhaust fan with HEPA filter to generate negative pressurization.
 - .4 Remove contaminated materials in waste bags. Damp wipe with detergent-and-water solution or HEPA vacuum outside surfaces of waste bags prior to removing from contaminated areas.
 - .5 Conduct air monitoring prior to occupancy to determine if area is fit to reoccupy.

3.5 Waste Handling and Disposal

- .1 Place waste and waste bags into disposal bin located centrally and close to work areas. Clean work areas, transfer waste to bin frequently. Lock bin when not in use.
- .2 Handle, transport and dispose of waste materials in accordance with requirements of authorities having jurisdiction.

END OF SECTION



PART 1 - GENERAL

1.1 Summary

- .1 Section Includes
 - .1 Treated lumber for framing and replacement of damaged materials.
 - .2 Site application of antiseptic treatments to wood surfaces that have been affected by or are adjacent to surfaces that have been affected by mould, mildew or other biological influences causing deterioration of wood.
 - .3 Treatment of all cut ends of all preservative treated wood products.
 - .4 Confirmation of borate treatment.
- .2 This work does not include areas where wood deterioration is advanced and replacement or repair is required.

1.2 References

- .1 Applicable Building Code / Building By-Law, most recent edition.
- .2 CAN/CSA 080 Series *Wood Preservation*.
- .3 AWPA C9-96 *Plywood Preservative Treatment by Pressure Process*

1.3 Delivery, Storage and Handling

- .1 Protect from freezing, moisture, water, UV exposure, and damage.
- .2 Guard against spillage. Store materials in spill-containment areas.

1.4 Waste Management and Disposal

- .1 Do not burn, bury or throw away toxic waste.
- .2 Dispose of waste in manner approved by local regulations. Comply with applicable hazardous waste disposal regulations.

PART 2 - PRODUCTS

2.1 Materials

- .1 Site-Applied Antiseptic Solutions: Borocal 20-2, as directed by Consultant.
- .2 Tools: Bristle brush or sponge brush.
- .3 Borate Test Kit: Verify! (borate testing kit) by CBR Products.

2.2 Wood Preservative

- .1 Use alkaline copper quaternary (ACQ) preservative for new lumber and plywood to be exposed to weather.

- .2 Use lumber, sheathing, blocking and strapping borate pressure-treated to CAN/CSA 080 Series *Wood Preservation*.
- .3 Leave deck and roof sheathing untreated to receive fully-adhered membranes.

PART 3 - EXECUTION

3.1 Examination

- .1 Carefully examine all wood surfaces exposed during Work of this and other sections.
- .2 Investigate structure for problems related to safe execution of Work and report unsatisfactory conditions to Consultant before beginning work.
- .3 Do not treat any piece affected by rot through more than 20 percent of its cross-sectional area. Notify Consultant and remove and replace as outlined in other Specifications sections.

3.2 Preparation

- .1 Protection
 - .1 Protect painted surfaces from contact with preservative during application and for 3 days afterward.
 - .2 Protect adjacent surfaces from intentional or accidental contact with preservative.
 - .3 Follow manufacturers' safety requirements.

3.3 Site Application

- .1 Remove fungal growth on wood surface with scraper prior to application.
- .2 Apply mixture by brush.
- .3 Apply 2 coats of antiseptic solution mixture to:
 - .1 Wood surfaces where minor rot has been cut away and removed.
 - .2 Wood surfaces adjacent to or in contact with locations where rotted wood has been removed. Treat adjacent lumber to a minimum of 1 stud space.
 - .3 Cut edges of pressure-treated lumber.

3.4 Factory Application

- .1 ACQ-treated lumber to be factory treated to CSA 080.2 *Preservative Treatment of Lumber, Timber, Bridge, Ties and Mine Ties by Pressure Process*, to obtain an average net retention of 4.0 kg/m³ ACQ for above-ground or 6.4 kg/m³ ACQ for ground contact by assay.
- .2 Borate-treated lumber to be factory treated to CSA 080.
- .3 Treated plywood sheathing to be vacuum pressure impregnated with preservative in accordance with requirements of AWPA C9-96 *Plywood Preservative Treatment by Pressure Process*.
- .4 Following water-borne preservative treatment, dry dimensional lumber and plywood sheathing to maximum moisture content of 19 percent.

3.5 Field Quality Control

- .1 Confirmation: At randomly selected locations or as directed by Consultant, use borate test kit to confirm application of borate.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Section Includes:
 - .1 New plywood sheathing and decking.
 - .2 Wood blocking and materials, and other rough carpentry work as may be required to execute the work as specified in other sections of these specifications as shown in the drawings.
 - .3 Rough carpentry repairs where required due to water damage and rot are specified herein but are not to be included in the base bid.
- .2 Related Sections
 - .1 Section 06 05 73 Wood Treatment

1.2 References

- .1 Applicable Building Code / Building By-Law, most recent edition.
- .2 CAN3-086.1-M94 *Engineering Design in Wood*.
- .3 CAN/CSA-080 Series *Wood Preservation*
- .4 CAN/CSA-0141-91 (R2001) *Softwood Lumber*.
- .5 CAN/CGSB-71.26 *Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems*.
- .6 B111-1974 (R1998) *Wire Nails, Spikes, and Staples*.
- .7 0121-M1978 (R2001) *Douglas Fir Plywood*.
- .8 ANSI/ASME B18.2.1-1996 *Square and Hex Bolts and Screws, Inch Series*.
- .9 ASME B18.6.4-1998 (R2005) *Thread Forming and Thread Cutting Tapping Screws And Metallic Drive Screws*
- .10 ASTM A 36/A 36M-00a *Carbon Structural Steel*.
- .11 ASTM A 307-00 *Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength*.

1.3 Delivery, Storage and Handling

- .1 Protect from freezing, moisture, water, UV exposure and damage. Maintain and store in dry, weatherproof area.

PART 2 - PRODUCTS

2.1 Materials - General

- .1 Moisture content of wood products and materials specified in this section to be 19 percent or less.



2.2 Lumber Material

- .1 Lumber: unless specified otherwise, D.Fir, S4S, #2 grade or better, in accordance with CSA 0141 *Softwood Lumber* and *NLGA Standard Grading Rules for Canadian Lumber*, latest edition.
- .2 Blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
 - .1 Board sizes: Standard or better grade.
 - .2 Dimension sizes: Standard light framing or better grade.
 - .3 Post and timber sizes: Standard or better grade.

2.3 Panel Materials

- .1 Douglas Fir plywood (DFP): to CSA 0121-M1978, standard construction.
- .2 Wall sheathing: borate-treated, 1/2 inch thickness for stud spacing less than 24 inches on centre.
- .3 Low-sloped roof sheathing: 5/8 inch thickness.
- .4 Pitched roof sheathing: borate-treated, 1/2 inch thickness for truss or rafter spacing up to 24 inches on centre with edge support.

2.4 Fasteners

- .1 Nails, spikes and staples to CSA B111.
- .2 Framing nailing to conform to requirements of applicable building code or building by-law.
- .3 Unless otherwise indicated, use stainless steel fasteners for or in ACQ-treated wood. Other fasteners to be hot-dip galvanized to CAN/CSA-G164 or irregularly-shaped articles with minimum zinc coating of 320g/m².
- .4 Use hot-dipped galvanized common nails for framing and sheathing to comply with wood-frame construction requirements of applicable codes. Use nails of sufficient length so that not less than half of their required length penetrates into second framing member.
- .5 Screws: to ASME B18.6.4-1998 (R2005) *Thread Forming and Thread Cutting Tapping Screws And Metallic Drive Screws*.
- .6 Bolts: 1/2 inch diameter hot-dip galvanized, unless indicated otherwise, complete with nuts and washers.
- .7 Proprietary Fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, as recommended for purpose by manufacturer.

2.5 Adhesive

- .1 Deck sheathing adhesive to CAN/CGSB-71.26 *Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems*.

2.6 Source Quality Control

- .1 Lumber Identification: by grade stamp of agency certified by Canadian Lumber Standards Accreditation Board.

- .2 Plywood Identification: by grade mark in accordance with applicable CSA standards.

PART 3 - EXECUTION

3.1 Examination

- .1 Carefully examine existing visible framing and surrounding sheathing; ensure all existing materials are in good condition and suitable to accept work of this section.
- .2 Before proceeding with the Work, notify Consultant of locations where there is evidence of water damage or rot.
- .3 Review wall framing for structural steel hardware, including hold-downs, straps, threaded rods and other hardware. Notify Consultant for review prior to covering up with new sheathing.
- .4 Review existing wall sheathing nail spacing. Notify Consultant if nail spacing is less than 6 inches on centre at panel ends and less than 12 inches along intermediate supports.
- .5 Where existing sheathing is removed, ensure framing has not been adversely affected by moisture before proceeding with work.
- .6 Mark areas of deterioration for removal and notify Consultant for review and approval before proceeding.
- .7 In areas where sheathing has been removed to expose insulation, note position of plumbing, gas and electrical lines to avoid damaging these items when nailing or attaching covering material.
 - .1 Be responsible for and rectify damage to hidden utilities as a result of nailing or attaching covering material or failure to properly document locations of these items when exposed.

3.2 Installation - General

- .1 Nailing Precautions
 - .1 Prior to nailing through plywood substrates, take all necessary precautions to ensure that plumbing, gas, and electrical lines will not be damaged.
 - .2 Install a minimum #16 MSG steel plate on exterior face of studs to cover gas, plumbing or electrical lines that run through holes in studs or plates.
- .2 Surface-Applied Wood Preservative: Before installing, re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative as indicated in Section 06 05 73 Wood Treatment.

3.3 Framing Installation

- .1 Where directed by Consultant, replace existing damaged framing members with new borate-treated lumber to match or exceed size and grade of existing element.
- .2 Comply with wood framing requirements of applicable building code or building by-law.

3.4 Wall Sheathing Installation

- .1 Where required due to repairs, install new borate-treated wall sheathing over existing or repaired wall framing.

- .2 Locate and cut sheets for multiple sheet installation with end joints staggered.
- .3 Hook-cut sheets to fit around corners of doors, windows and other openings.
- .4 Fasten plywood sheets using specified fasteners at 6 inches on centre at panel edges and 12 inches on centre along intermediate supports.

3.5 Roof Sheathing Installation

- .1 Install new plywood sheathing over existing joists and tapered sleepers, perpendicular to joist direction and with ends at right angles. Stagger end joints.
- .2 Fasten plywood sheathing to joists or tapered sleepers with fasteners at 6 inches on centre along panel edges and 12 inches along intermediate supports.

3.6 Miscellaneous Installation

- .1 Install blocking as required to space out and support casework, facings, fascia, soffit, railings, cladding and other work as required.
- .2 Align and plumb faces of blocking to tolerance of 1:600.
- .3 Install rough bucks, nailers, and linings to rough openings as required to provide backing for frames and other work.
- .4 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure with galvanized fasteners.
- .5 Install sleepers as indicated.

3.7 Miscellaneous Fastening

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .2 Countersink bolts where necessary to provide clearance for other work.

3.8 Cutting and Patching

- .1 Cut and patch in accordance with Section 01 73 29 Cutting and Patching.
- .2 Do not cut or patch framing or sheathing unless directed by Consultant. Consultant will issue site direction on appropriate and specific course of action to be taken.
- .3 Ensure cuts are straight, true and square.
- .4 Make vertical cuts at centreline over framing members. Where possible, make horizontal cuts over framing members.
- .5 Ensure resulting surface left after cutting is in good condition, with no loose or broken edges, and suitable to receive patch without resulting gaps.
- .6 Cut patch piece to fit in area where deteriorated sheathing was removed and to fit snugly at all locations and along all edges.

- .7 Cut framing members affected by rot only at Consultant's direction, and not less than 24 inches from furthest point of deterioration.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Polyisocyanurate insulation on low-slope roof level.
- .2 Polyisocyanurate insulation on pitched metal roofs

1.2 References

- .1 Applicable Building Code / Building By-Law, most recent edition.
- .2 Roofing Contractors Association of BC (RCABC) *Roofing Manual*.
- .3 ASTM C 1289-11A *Standard Specification for Faced Rigid Cellular Polyisocyanurate Insulation Board*.
- .4 ASTM E 108 *Standard Test Methods for Fire Tests of Roof Coverings*.
- .5 ASTM E 119 *Standard Test methods for Fire Tests of Building Constructions and Materials*.
- .6 FM 4450 *Approval Standard – Class I Insulated Steel Roof Decks*.
- .7 FM 4470 *Approval Standard – Class I Roof Covers*.
- .8 CAN/ULC S770 *LTTR – Long-Term Thermal Resistance*, based on ASTM C1303

1.3 Submittals

- .1 Before commencement of the work provide to Consultant and Owner the following:
 - .1 Material Safety Data Sheets (MSDS) for review and posting on job site.
 - .2 Product literature, including specification sheets and installation instructions.
 - .3 Samples of relevant materials for selection.
 - .4 Written assurance from manufacturer that long-term resistance of insulation will not vary from manufacturer's published values.

1.4 Quality Assurance

- .1 Conform to latest guarantee standards of the Roofing Contractors Association of British Columbia (RCABC) as published in *RCABC Roofing Practices Manual* for 5-year guarantee, unless modified by the Contract documents to exceed those minimums.
- .2 Employ only skilled applicators approved by insulation manufacturer.
- .3 Maintain a full-time supervisor on site during execution of the Work. Supervisor to have roofing trade qualifications or equivalent and a minimum of 5 years of experience in roofing work of a similar nature and scope as specified herein.

1.5 Delivery, Storage and Handling

- .1 Store materials elevated from contact with ground and moisture and protected from weather.

- .2 Avoid prolonged exposure of light- and heat-sensitive materials to sunlight.
- .3 Store combustible materials away from heat and open flame.
- .4 Consult manufacturer's MSDS for information on materials safety and handling.
- .5 Waste Management and Disposal
 - .1 Dispose of waste insulation daily in accordance with local regulations and insulation manufacturer's instructions.
 - .2 Do not dispose of any materials through the interior of the building; dispose all materials externally via chutes, lifts, etc.

1.6 Project/Site Conditions

- .1 Weather conditions permissible for roofing are subject to the discretion of the roofing contractor and the Consultant, except that in no case shall roofing work be carried out under the following conditions:
 - .1 When temperature of substrate or air is lower than or forecast to drop below 2 degrees C during course of work.
 - .2 During wet weather, forecast imminent wet weather, or when site conditions have been adversely affected by recent wet weather.
- .2 Maintain roof in weather-tight condition when not performing roofing work.

PART 2 - PRODUCTS

2.1 Polyisocyanurate Insulation

- .1 Glass faced, closed-cell polyisocyanurate; achieve minimum LTTR (Long Term Thermal Resistance) R-value of 5.6 per inch at 24 degrees C, compressive strength of 20 pounds per square inch. Minimum thickness at drains to be 4 inches (two layers of 2 inch each).
- .2 Preapproved Products:
 - .1 AC Foam III as manufactured by Atlas Roofing Corp.
 - .2 Colgrip as manufactured by Soprema Inc.
 - .3 HP-H as manufactured by Carlisle Syntec
 - .4 H-Shield CG as manufactured by Hunter Panels LLC
 - .5 Paratherm as Manufactured by Siplast Canada Inc.

2.2 Sloped Polyisocyanurate Insulation

- .1 Glass faced closed-cell polyisocyanurate to CAN/CGSB-51.20-M87; achieve minimum LTTR (Long Term Thermal Resistance) R-value of 5.6/inch at 24 degrees C, compressive strength of 20 pounds per square inch. Minimum thickness at drains to be 4 inches. Information with regards to the manner in which sloping is to provided is included in points below:
 - 1. Contractor to utilize crickets with 4% slope.

PART 3 - EXECUTION

3.1 Examination

- .1 Carefully examine substrates to receive work of this section. Report observed deficiencies that may not be corrected after the work or that may adversely affect performance or appearance of work of this section.

3.2 Preparation

- .1 Ensure surfaces to receive insulation are clean, dry and free of frost, dirt, and loose or foreign matter.
- .2 Protection
 - .1 Have on site necessary tarpaulins, polyethylene, or other suitable materials to provide required protection in the event of rain.
 - .2 Protect adjacent work, materials and surfaces from splash, spray, or spillage. Provide appropriate protection to building and ground areas where materials are being transported to roof.

3.3 Application

- .1 Polyisocyanurate
 - .1 Install insulation after building substrate materials are dry.
 - .2 Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
 - .3 Loose-lay polyisocyanurate insulation over substrate. Ensure half a sheet staggers insulation joints.
 - .4 Install insulation to maintain continuity of thermal protection to building elements and spaces.
 - .5 Fit insulation closely around electrical boxes, plumbing, heating pipes, ducts, and other protrusions.
 - .6 Cut and trim insulation neatly to fit spaces. Trim insulation to profile where insulation abuts a sloping surface.
 - .7 Butt joints tightly; offset vertical joints.
 - .8 Offset both vertical and horizontal joints in multiple layer applications a minimum of 12 inches.
 - .9 Do not enclose insulation until it has been inspected and approved by Consultant.

3.4 Cleaning and Protection

- .1 Protect installed insulation from damage during the course of Work.
- .2 Immediately clean up spilled and excess primers and mastic sealants that will not be completely covered by subsequent work. Make good the appearance of any exposed areas.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Single layer spun bonded poly-olefin air barrier membrane behind new cladding assemblies and where required by the Work.
- .2 Air barrier materials to provide continuous seal between components of building envelope and building penetrations

1.2 References

- .1 Applicable Building Code / Building By-Law, most recent edition.
- .2 Association of Wall and Ceiling Contractors of BC (AWCC) *Specifications Standards Manual*.
- .3 ASTM E-96-90 *Standard Test Methods for Water Transmission of Materials*.
- .4 ASTM E-1677-95 *Standard Specification for an Air Retarder (AR) Material*.

1.3 Delivery, Storage and Handling

- .1 Protect from moisture, water, UV exposure and damage. Provide and maintain dry, off-ground weatherproof storage. Store rolls in upright position.

1.4 Sequencing

- .1 Sequence Work to permit installation of materials in conjunction with related materials and seals.

PART 2 - PRODUCTS

2.1 Breathable Air Barrier Membrane

- .1 Spun-bonded poly-olefin breathable air barrier membrane.
- .2 Product: Tyvek Commercial Wrap as manufactured by DuPont Company.
- .3 Size: Manufacturer's standard sizes to minimize seams and joints in installed assemblies.

2.2 Accessories

- .1 Sealing Tape: Tuck Tape by Canadian Technical Tape Ltd.

PART 3 - EXECUTION

3.1 Examination

- .1 Carefully examine substrates to receive Work of this section. Report or correct observed deficiencies that may not be corrected after Work is finished or that may adversely affect performance or appearance of Work of this section.

3.2 Air Barrier Membrane Installation

- .1 Follow requirements of applicable Building Code / Building By-Law, most recent edition and *AWCC Specifications Standards Manual*.
- .2 Minimize use of staples. Use staples only as required to secure air barrier membrane until wood furring is installed. Where practical, install staples at locations that are to be covered by wood furring.
- .3 Install air barrier membrane horizontally, beginning 2 inches below lowest point of framed wall assembly.
- .4 Install successive strips, proceeding upwards, with each succeeding sheet overlapping sheet below.
- .5 Cut air barrier membrane into suitable widths to allow for proper integration and lapping of successive courses.
- .6 Lap horizontally by 4 inches minimum, arranged to shed exterior moisture away from building at all locations.
- .7 Lap vertically by minimum 6 inches minimum.
- .8 Fully form all inside corners to prevent tenting.
- .9 Repair small damaged areas as follows:
 - .1 Apply self-adhered bituminous membrane primer to affected area, followed by an oversized piece of self-adhered bituminous membrane that is acceptable to the manufacturer.
 - .2 Apply water-resistant sealing tape where approved by Consultant.
- .10 Follow lapping rules in all locations, including around intersections of building elements and at penetrations and openings.

3.3 Air Barrier Continuity

- .1 Ensure air barrier continuity at:
 - .1 Windows, doors, and miscellaneous glazing.
 - .2 Electrical components, mechanical services and vents.
 - .3 Balcony joist spaces and intersecting walls.
 - .4 Interfaces with roof membranes and foundation elements.
- .2 Extend air barrier membrane into joist spaces, behind intersecting walls and other locations as required to ensure air barrier continuity.
- .3 Ensure air barrier membranes and adjacent building elements are clean and free of any deleterious matter that may adversely affect the bond to associated tapes and self-adhered bituminous membranes.
- .4 Tape all horizontal and vertical laps. Apply tape to achieve continuous, positive, permanent adhesion, with no wrinkles or "fish mouths".

- .5 Tie air barrier membrane into adjacent building elements, penetrations, and openings with self-adhered bituminous membrane per Section 07 13 26 Self-Adhering Bituminous Membrane and as shown on project Drawings, except as noted.

3.4 Cleaning and Protection

- .1 Immediately clean up spilled and excess primers and mastic sealants that will not be completely covered by subsequent work. Make good the appearance of any exposed areas.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Self-adhered fabric-reinforced thermoplastic polyolefin (TPO) membrane roofing system applied to low-sloped roof between pitched metal roofs at Building 27 – Granville Island.
- .2 Alternates: Membrane manufacturers and suppliers are invited to submit applications and test data for approval of alternate systems for use on this project. To be accepted, proposed alternates must meet membrane requirements as specified herein. Submit applications to Consultant in a form that facilitates comparison to specified systems.

1.2 References

- .1 Applicable Building Code / Building By-Law, most recent edition.
- .2 Roofing Contractors Association of British Columbia (RCABC) *Roofing Practices Manual*.
- .3 Membrane manufacturer's technical and installation manuals.
- .4 ASTM D6878 – 08E1 – *Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing*
- .5 CAN/ULC-S704-2001 – *Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Fixed*.

1.3 System Description

- .1 Performance Requirements:
 - .1 Design and installation of new roof assembly to meet minimum performance levels of CSA A123.21-10.
 - .2 Design pressures and zone sizes are as provided below:

| Zone Size | Design Pressure (including safety factor of 1.5) [psf] |
|-----------|--|
| All roof | 93 psf |

1.4 Submittals

- .1 Before commencing Work, provide Consultant and Owner with the following:
 - .1 Test report showing that manufacturer's products meet required design pressures. Test report must be from approved CSA A123.21 testing laboratory.
 - .2 Material Safety Data Sheets (MSDS) for review and posting on job site.
 - .3 Product literature, including specification sheets and installation instructions.
 - .4 Samples of relevant materials for colour selection.
- .2 At project completion, provide Owner with warranty certificates and guarantee information, as well as Maintenance Guide for completed roofing system.

1.5 Quality Assurance

- .1 Use only components supplied or accepted by a single membrane manufacturer.

- .2 Conform to latest Guarantee Standards of the Roofing Contractors Association of British Columbia (RCABC) as published in RCABC's *Roofing Practices Manual*.
- .3 Do not use curable or perishable materials past their printed expiry dates.
- .4 Contractor Qualification
 - .1 Roofing Contractor and subcontractors, throughout bidding and installation, must hold current business licenses and be officially approved contractors by the waterproofing product manufacturer.
 - .2 Only skilled trade persons officially employed by a roofing Contractor and operating adequate and necessary equipment will be authorized to perform roofing work.
 - .3 Membrane application is to be conducted by tradesman with the following qualifications in the following crew ratios: 1 journeyman with a valid Provincial Trade Qualification certificate to 2 indentured apprentices to 2 labourers.
- .5 Maintain a full-time supervisor on site during the execution of the work. Supervisor to have roofing trade qualification or equivalent and have minimum 5 years' experience with waterproofing work of similar nature and scope.
- .6 Manufacturer Representative
 - .1 Enable and facilitate access to the work site by product manufacturer's designated representative.
 - .2 Manufacturer's representative must be present for the pre-installation meeting.
 - .3 Proof of Technical Competence: Prior to commencing project, submit to JRS proof that manufacturer's representative is certified by a relevant third-party association.
- .7 Pre-Installation Conference
 - .1 Hold a pre-installation meeting prior to start of waterproofing work with waterproofing contractor's representative, JRS Engineering and Owner in attendance. Purpose of this meeting is to review installation conditions particular to each project. Produce and distribute meeting minutes/report to attendees and other stakeholders as identified by JRS Engineering and Owner.

1.6 Product Delivery, Storage, and Handling

- .1 Consult manufacturers' MSDS for materials handling procedures.
- .2 Deliver and store materials in original containers with manufacturer's labels and seals intact.
- .3 Store materials elevated from contact with ground and moisture and protected from weather.
- .4 Where climatic conditions and installation procedures warrant, store membrane rolls in heated enclosures prior to use, as recommended by manufacturer. Bring only enough rolls to working area as can be used immediately.
- .5 Avoid prolonged exposure of light- and heat-sensitive materials to sunlight.
- .6 Store combustible materials away from heat and open flame.
- .7 Protect insulation and underlayment from elements and keep dry. Store off ground and cover completely with breathable material, such as tarp or canvas. Keep weighted as necessary to prevent wind damage.

- .8 Store curable materials (i.e. adhesives, sealants) within manufacturer-recommended temperature range, with lids tightly sealed. Liquid adhesives and sealants to be a minimum of 16 degrees C before use.

1.7 Project/Site Conditions

- .1 Do not perform installation work during periods of rain or inclement weather or on frosty or wet surfaces. Installation work may only be performed when outside air temperature is minimum 10 degrees C and rising.

1.8 Warranty

- .1 Refer to Section 01 78 36 Warranties.

PART 2 - PRODUCTS

2.1 Membrane System

- .1 Standards: conform to RCABC Guarantee Standards and appropriate CSA, CGSB, and ASTM standards for materials used in specified roofing system; use materials listed in RCABC Accepted Materials List of RCABC's *Roofing Practices Manual*.

- .2 Self Adhesive TPO Membrane: Meet performance criteria outlined in table below:

| Product Characteristics | Field | Flashing |
|--|---|---|
| Average Total Thickness (mil) | 80 | 80 |
| Thickness over Scrim (mm) | 0.610 | 0.610 |
| Ultimate Elongation @ 23°C | 25% | 25% |
| Dimensional Stability | 0.5% | 0.5% |
| Puncture Resistance (kN) | 1.6 | 1.6 |
| Ozone Resistance (ASTM D1149) | No Cracks | No Cracks |
| Resistance to Weathering (ASTM G155 (0.70 W/m ² 80°C B.P.T.)) | No loss of breaking or tearing strength | No loss of breaking or tearing strength |
| Field Seam Strength (kN/m) | 4.4min 10.5 Average | 4.4min 10.5 Average |
| Colour | Grey | Grey |

- .3 Field: TPO membrane (Maximum sheet width to be used to minimize seams)
 - .1 Approved Product: 80mil Sure-Weld by Carlisle Syntec
- .4 Flashing: TPO membrane (Maximum sheet width to be used to minimize seams)
 - .1 Approved Product: 80mil Sure-Weld by Carlisle Syntec
- .5 Overlay Board
 - .1 Minimum 3/8-inch [9.5 mm] thick gypsum based overlay board.
 - .1 Approved Product: Securock by CGC.
- .6 Mechanical Fasteners – Self-Adhesive Base Ply Flashing
 - .1 Screws: Corrosion-resistant #14 roofing fasteners, #03 Phillips head drive, 13 threads per inch, self-drilling points. Of sufficient length to provide minimum 3/4-inch projection through roof deck.

- .2 Plates for Insulation and Overlay Board: 3 inch square-shaped with rounded corners Round-shaped insulation and overlay board plate
- .3 Plates for Russ Strip: 2 inch round seam plates
- .4 Approved Products:
 - .1 For securing of insulation and overlay board: HP Fasteners and 3 inch square plates by Carlisle Syntec.
 - .2 For securing of Russ Strip: HP-X Fasteners with 2-inch seam plates by Carlisle Syntec.
- .7 Adhesives: Two-part low-rise urethane adhesive suitable for attachment of insulation and overlay boards to the underlying substrate.
 - .1 Approved Product: Fast Dual Cartridge Adhesive by Carlisle Syntec.
- .8 Primers: Single-component adhesive enhancing primers to enhance adhesion of waterproofing membranes. Product as approved by membrane manufacturer for specific application.
- .9 Air/Vapour Barrier (SA Membrane): 40mil SBS modified bituminous self adhesive air/vapour barrier membrane.
 - .1 Approved Product: 725TR by Carlisle Syntec.

2.2 Accessories

- .1 Fasteners, flashings, adhesives, sealants and other accessories as recommended and approved by manufacturer.
- .2 Drains: Spun copper heat-weldable clamp-tite re-roof drains sized to match existing
 - .1 Approved Product: Spun Copper Clamp-Tite Drain, TPO Weldable, as manufactured by Menzies Metal
- .3 Walkway Pads: 80mil heat-weldable TPO walkway roll (minimum 34 inches width).
 - .1 Approved Product: Sure-Weld Walkway Roll as manufactured by Carlisle SynTec.

PART 3 - EXECUTION

3.1 Preparation

- .1 Ensure substrate is even, without noticeable high spots or depressions and free of accumulated water, ice or snow.
- .2 Clear substrate of debris and foreign material. Immediately report defects in substrate surface to Consultant. Do not proceed with installation until defects are corrected and corrections approved by Consultant.

3.2 Insulation Attachment

- .1 Refer to Section 07 21 13 Rigid Insulation.
- .2 Do not install more insulation or underlayment than can be covered by membrane in the same day.

3.3 Membrane Installation and Hot Air Welding

- .1 Apply membrane in accordance with manufacturer's installation instructions and RCABC standards manual. Use manufacturer-approved hot air welding equipment only.
- .2 Clean membranes exposed to elements for 7 days or longer prior to hot welding in accordance with manufacturer's recommendations. Ensure cleaner residue is fully removed prior to proceeding with hot welding.
- .3 Overlap adjoining membrane sheets lengthwise by minimum of 2 inches along selvage edge to provide for minimum 1-1/2 inch hot air weld. Shingle splices to avoid bucking of water.
- .4 Butt membrane sheet ends together and overlay with 6-inch wide reinforced membrane hot air welded along all edges. Seal membrane edges with sealant as recommended by membrane manufacturer.
- .5 Flashings: Flash walls, curbs and penetrations in accordance with manufacturer's installation instructions. Terminate flashings appropriately in accordance with manufacturer's recommendations.
- .6 Walkways: Install roof walkways leading from roof access points to all mechanical equipment and equipment rooms in accordance with membrane manufacturer's recommendations.

3.4 Cleaning and Protection

- .1 Prevent damage from construction activities until permanent protection is installed.
- .2 Upon completion of roofing system, clean entire surface of membrane roof by scrubbing with non-abrasive soapy water and rinsing completely with clean water.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Metal flashings, profiles as required for assembly of:
 - .1 Sheet flashings (general)
 - .1 Parapet cap flashings
 - .2 Hood vents
 - .3 Miscellaneous flashings and trim as required
 - .2 Chimney cap flashing.
 - .3 Gutters and downpipes.
- .2 Other miscellaneous metalwork as may be required for construction of exterior wall assembly.

1.2 References

- .1 Applicable Building Code / Building By-Law, most recent edition.
- .2 Roofing Contractors Association of British Columbia (RCABC) *Roofing Practices Manual*.
- .3 Canada Mortgage and Housing Corporation (CMHC) *Best Practice Guide: Flashings*.
- .4 Sheet Metal and Air Conditioning Contractors National Association (SMACNA) *Sheet Metal Work Architectural Manual* and *Architectural Specification for Sheet Metal Work*.
- .5 ASTM A755 / A755M-11, *Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products*.
- .6 ASTM A792 / A792M-05, *Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process*.
- .7 ASTM B117-11, *Standard Practice for Operating Salt Spray (Fog) Apparatus*.
- .8 ASTM D523-08, *Standard Test Method for Specular Gloss*.
- .9 ASTM D2244, *Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates*.
- .10 ASTM D2247-11, *Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity*.
- .11 ASTM D3363-05(2011)e2, *Standard Test Method for Film Hardness by Pencil Test*.
- .12 ASTM D3964-10, *Standard Practice for Selection of Coating Specimens for Appearance Measurements*
- .13 ASTM D4138-07a, *Standard Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means*.
- .14 ASTM D4145-10, *Standard Test Method for Coating Flexibility of Prepainted Sheet*.

- .15 ASTM D4214-07, *Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.*
- .16 ASTM D5402-06(2011), *Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs.*

1.3 System Description

- .1 Fabricate and install flashings to provide waterproof and weather-resistant performance by directing water away from other building elements susceptible to deterioration when exposed to excessive wetting. Use flashings for intended purpose only.

1.4 Submittals

- .1 Submit 12-inch-long sample of each type and profile of sheet metal part, gauge and paint finish as specified.

1.5 Delivery, Storage and Handling

- .1 Deliver and store materials in protective wrappings and containers.

PART 2 - PRODUCTS

2.1 Materials

- .1 Galvalume Sheet: Thickness as noted below to ASTM A792 / A792M, 55 percent AL-ZN, Grade: CS, Type A, SS 33, AZ50 / AZM 150 nominal coating weight of 0.5 oz per square foot (total both sides), except as noted below. Finish: To meet the performance Criteria as noted in the following Table:

| Property | Test Method | PVDF: 70% Fluoropolymer Polyvinylidene Fluoride (PVDF) Resin |
|---------------------|--|--|
| Dry Film Thickness | ASTM D 4138 | 25µm ± 5µm |
| Specular Gloss | ASTM D523 | Typical 3 – 45 @ 60°C |
| Humidity Resistance | ASTM D 2247 | 1000 Hours; 100% Relative Humidity @ 38°C A few blisters no larger than #8 |
| Salt Spray | ASTM B 117 | 1000 Hours; 5% Salt Spray @ 95°C Less than 3mm creep from scribe line. No Blisters |
| Chalk Resistance | ASTM D 4214 | Method A; 40 Years Exposure Vertical: Rating no less than 8 Non Vertical: Rating no less than 6 |
| Colour Retention | ASTM D 2244 (Clean Surfaces per ASTM D3964) | 40 Years Exposure Able to withstand 100 Double MEK Rubs Vertical: Less than 5 Δ Hunter Units Non |
| Pencil Hardness | ASTM 3363 | Minimum F |
| T Bend | ASTM D 4145 | No loss of adhesion when subjected to 1T 180° Bend and Tape pull test |
| Cure Test | ASTM D 5402 | Able to withstand 100 Double MEK Rubs |

- .1 Sheet metal to be minimum 26 gauge (0.217) thickness unless otherwise noted
 - .1 Cap Flashings: 24 gauge (0.0276 inch).
 - .2 Fascia Flashings and Chimney Cap Flashings: 22 gauge (0.0336 inch).

- .2 Gutters and Downpipes
 - .1 Roll-formed pre-finished aluminium 0.032 inches thick. Colour from manufacturer's standard range, to be selected by Owner.
 - .1 Funnel Outlet: K-Style Funnel Outlet, as manufactured by Precision Gutters Ltd.
 - .2 Clean Out: Leaf Catcher, as manufactured by Precision Gutters Ltd.
- .3 Fireplace Vents
 - .1 Pre-finished, 20 gauge (0.0359 inch) stainless steel with full flange, supplied by licensed gas fitter and conforming to Gas Safety Code.

2.2 Accessories

- .1 Touch-up paint as recommended by factory applying prefinished paint to sheet metal.
- .2 Solder to ASTM B32. Flux shall be rosin, cut hydrochloric acid, or commercial preparation suitable for materials to be soldered.
- .3 Clips to be shop formed from minimum 22 gauge (0.0336 inch) galvalume or one gauge heavier than base material.
- .4 Isolation Coating: alkali resistant bituminous paint.
- .5 Fasteners: 300 Series stainless steel.

2.3 Fabrication

- .1 Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA Standards Manual, RCABC Roofing Practices Manual and other recognized industry best practices.
- .2 Provide end dams in accordance with applicable Building Code / Building By-Law.
- .3 Fabricate metal flashing and other sheet metal work in accordance with applicable RCABC guarantee standards.
- .4 Form pieces in 10-foot maximum lengths. Make allowance for expansion at joints. Fabricate flashing in continuous consistent length pieces (under 10 feet) to avoid unnecessary joints.
- .5 Hem exposed edges on underside 1/2 inch. Mitre and seal corners with sealant.
- .6 Form sections square, true and accurate to size, free from distortion, crude edges and other defects detrimental to appearance or performance.
- .7 Sheet metal greater than 12 inches in depth to be fabricated from minimum 24 gauge (0.0276 inch) cross-broken sheets.
- .8 Form exposed sheet metal work free from buckling, tool marks and any other distortion or marks affecting performance or appearance.
- .9 Form inside corners by folding or continuous soldering.
- .10 Cap flashings shall be formed to slope to the interior, through-wall and sill pan flashings shall be formed to slope to the exterior.

- .11 Soldered joints are required at end flange terminations, including: saddle points, flashing terminations, hood vent flanges, and other custom flashing. Solder in accordance with good practice.
- .12 Fabricate flashings covering roof membranes, pitched roofing, deck membranes, slab waterproofing, and others as a two-piece design that permits easy removal of lower flashing to provide full access to membrane terminations protected by flashing.

PART 3 - EXECUTION

3.1 Examination

- .1 Take all necessary precautions to ensure that all plumbing, gas, and electrical lines will not be damaged prior to nailing through plywood substrates.
- .2 In areas where sheathing has been removed to expose the insulation, note position of plumbing, gas and electrical lines so as not to create damage when nailing or attaching covering material.
- .3 Assume responsibility for damage to said items as a result of nailing or attaching covering material, or failure to properly document location of these items when exposed.

3.2 Installation

.1 General

- .1 Prevent contact between dissimilar metals to avoid galvanic corrosion.
- .2 Erect work straight, sharp, plumb, and level in true plain, free of bulges and waves, and in a consistent fashion. Verify all dimensions on site.
- .3 Use concealed fastener system for cap flashings; exposed fasteners are not acceptable. Install sill pan flashings using gasketed fasteners in locations to be fully covered by subsequent work.
- .4 Install continuous concealed on interior and exterior of vertical drip sections of cap flashing, fascia and other types of flashing.
- .5 Fabricate joints with “standing” or “S-lock” seams. Lap seams are not acceptable.
- .6 Provide minimum 5/8-inch high watertight end dams, formed using bread-pan method, at openings as required to prevent water from flowing into adjacent assemblies. Extend flashings beyond jamb openings.
- .7 Where soldering on pre-finished metal flashings:
 - .1 Remove factory enamel finish to expose raw metal in affected areas with neutralizing chemical. Wash surface with water and dry.
 - .2 Prime and finish affected area in accordance with Section 09 91 00 Painting
- .8 Where window head flashings require two separate pieces, locate flashing segment joints at the mid-point of the window.
- .9 Locate seams and joints to provide uniform and consistent appearance.
- .10 Fabricate and install pieces for cap flashings and through-wall flashings in maximum 10-foot lengths. Allow for expansion and contraction at joints.
- .11 Install sill pan flashings to fit snugly into existing or reconstructed openings. Ensure vertical returns are tight to building wall and pan drains to exterior.

- .12 Apply sealant to corners and joints to ensure permanent waterproof connections and assembly.
- .13 Apply isolation coating to metal surfaces to be embedded or in direct contact with concrete, mortar or cementitious materials.
- .2 Gutters
 - .1 Apply caulking and polyester reinforcing mesh to interior joints and penetrations. Clean and dry joints and penetrations prior to caulking application.
 - .2 Install gutters at deck drip locations with sufficient slope to downspouts.
 - .3 Install gutters to wooden fascias so that fascia-mounted aluminium railings can be fastened above.
- .3 Downpipes
 - .1 Install downpipes at existing active drain locations and extend to ground level or existing storm drain location.
 - .2 Minimize number of separate downpipes. Tie-in drains to single vertical line in any one location.
 - .3 Positively lap individual lengths by minimum of 3 inches.
 - .4 Secure downpipes to building at through-system flashing and drains using specified fasteners. Do not secure through cladding assembly.
 - .5 Provide concrete splash-pans at discharge locations where downpipes do not tie in to existing storm drains.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Supply and installation of new concealed-fastener metal roof panel assembly to the surface of Building 27 – Granville Island.

1.2 References

- .1 Applicable Building Code / Building By-Law, most recent edition.
- .2 Roofing Contractors Association of British Columbia (RCABC) *Roofing Practices Manual*.
- .3 Canada Mortgage and Housing Corporation (CMHC) *Best Practice Guide: Flashings*.
- .4 ASTM A755 / A755M-11, Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Preprimed by the Coil-Coating Process for Exterior Exposed Building Products.
- .5 ASTM A792 / A792M-05, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- .6 ASTM B117-11, Standard Practice for Operating Salt Spray (Fog) Apparatus.
- .7 ASTM D523-08, Standard Test Method for Specular Gloss.
- .8 ASTM D2244, Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
- .9 ASTM D2247-11, Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
- .10 ASTM D3363-05(2011)e2, Standard Test Method for Film Hardness by Pencil Test.
- .11 ASTM D3964-10, Standard Practice for Selection of Coating Specimens for Appearance Measurements
- .12 ASTM D4138-07a, Standard Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means.
- .13 ASTM D4145-10, Standard Test Method for Coating Flexibility of Preprimed Sheet.
- .14 ASTM D4214-07, Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
- .15 ASTM D5402-06(2011), Standard Practice for Assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs.
- .16 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA):
 - .1 *Sheet Metal Work Architectural Manual*
 - .2 *Architectural Specification for Sheet Metal Work*
- .17 ASTM A653/A653M-09a *Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Physical (Structural) Quality*.

1.3 Submittals

- .1 Prior to fabrication, submit product documentation and materials samples to Consultant, including panel sections, fasteners and hardware.
- .2 Provide Mill Certification showing that the metal used meets the minimum requirements of this specification.
- .3 It should be noted that JRS's drawings can be considered shop drawings if no modifications, additions, or deletions will be made to the drawings. As the structural performance has already been completed by JRS hand drawn drawings or mark-ups of JRS's drawings are acceptable for minor flashing profile changes.
- .4 Should significant additions and modifications, or alternate systems be utilized, new Engineered Shop Drawings completed with Engineer's Schedules must be submitted. Shop drawings to indicate the following:
 - .1 Roof plans,
 - .2 Details to allow for expansion and contraction, and are to include the following:
 - .1 Metal roof panels, fastening, including layout of fasteners and joints in panels
 - .2 Edge conditions, seams, joints, corners, panel profiles, assembly, anchoring techniques, and flashings
 - .3 Copings, closures, sealants, thickness of materials, and details of penetrations
 - .3 Description of proposed details that deviate from what is shown on plans.
 - .4 Drainage paths, and
 - .5 Method of structural attachment to building, including provisions for thermal movement and building movement. Identify structural fasteners.
- .5 Upon completion of the Work:
 - .1 Submit data for maintenance and cleaning
 - .2 Submit warranties

1.4 Quality Assurance

- .1 Installer/tradesmen involved in the work of this section must have a minimum of 4 years' documented experience of having regularly undertaken the type of work as outlined herein.
- .2 Mock-ups:
 - .1 Perform roof installation mock-up at Consultant-selected location.
 - .2 Schedule and undertake sequenced mock-up in presence of Consultant, complete with accessories, including membranes, flashings, trim, sealants, and cladding. Do not proceed with Work on a larger scale without approval in writing from Consultant.

1.5 Delivery, Storage and Handling

- .1 Refer to Section 01 40 00 Quality Requirements

1.6 Warranty

- .1 Provide the following warranties to the benefit of the Owner:
 - .1 Standard manufacturers coating performance warranty to the Owner
 - .2 Provide to the owner, a contractors warranty stating that the roof will stay watertight and weatherproof for a period of two (2) years from the date of substantial completion. The warranty is to cover panels, flashings, sealants, and accessories against defective materials and / or workmanship.

PART 2 - PRODUCTS

2.1 Materials

- .1 Galvalume Sheet: Thickness as noted below to ASTM A792 / A792M, 55 percent AL-ZN, Grade: CS, Type A, SS 33, AZ50 / AZM 150 nominal coating weight of 0.5 oz per square foot (total both sides), except as noted below. Finish: To meet the performance Criteria as noted in the following Table:

| Property | Test Method | PVDF: 70% Fluoropolymer Polyvinylidene Fluoride (PVDF) Resin |
|---------------------|--|--|
| Dry Film Thickness | ASTM D 4138 | 25µm ± 5µm |
| Specular Gloss | ASTM D523 | Typical 3 – 45 @ 60°C |
| Humidity Resistance | ASTM D 2247 | 1000 Hours; 100% Relative Humidity @ 38°C A few blisters no larger than #8 |
| Salt Spray | ASTM B 117 | 1000 Hours; 5% Salt Spray @ 95°C Less than 3mm creep from scribe line. No Blisters |
| Chalk Resistance | ASTM D 4214 | Method A; 40 Years Exposure Vertical: Rating no less than 8 Non Vertical: Rating no less than 6 |
| Colour Retention | ASTM D 2244 (Clean Surfaces per ASTM D3964) | 40 Years Exposure Able to withstand 100 Double MEK Rubs Vertical: Less than 5 Δ Hunter Units Non |
| Pencil Hardness | ASTM 3363 | Minimum F |
| T Bend | ASTM D 4145 | No loss of adhesion when subjected to 1T 180° Bend and Tape pull test |
| Cure Test | ASTM D 5402 | Able to withstand 100 Double MEK Rubs |

Sheet metal used for sheet metal roofing and all accessory metal to be minimum 24ga. unless noted.

2.2 Roll Formed Metal Roof Profile

- .1 Provide a snap-lock standing seam 24-gauge metal roof system, 1-3/4 inch snap-lock profile (min 1 5/8" male throat) and 18" inches width.
- .2 Panel must be roll formed using a roll form panel machine with no less than 14 rolling stations on either side.
- .3 Stiffening ribs to be included within the panel, Owner to choose from standard stiffening rib options.
- .4 Tolerances:
 - .1 1/32" for Dimensions



.2 ½ Degree on Angles

- .5 Finish: Colour of metal to be chosen by the Owner from standard colour range.
- .6 Pre-approved Products:
 - .1 Snap Lock II 675 Panel Profile by New Tech Machinery.
 - .2 UC-14 by Firestone Metal Products
 - .3 R-Mer Loc by Garland Industries.

2.3 Deck Level self adhesive membrane

- .1 Pre-approved Products
 - .1 Clad-Gard SA manufactured by Firestone BP
 - .2 Titanium PSU manufactured by Interwrap Inc.

2.4 Underlay/Slip Sheet

- .1 High-performance synthetic roofing underlay:
- .2 Pre-approved Products:
 - .1 Clad-Gard MA manufactured by Firestone BP
 - .2 Titanium UDL-50 manufactured by Interwrap Inc.

2.5 Accessories

- .1 Fasteners for snow drag load: #12 screws passing completely through ½-inch plywood. Frequency per table:
 - .1 High pitch roof:

| Number of fasteners | Panel length (feet) |
|---------------------|---------------------|
| 10 | 61 |
| 8 | 50 |
| 7 | 40 |
| 5 | 30 |
| 4 | 20 |
| 2 | ≤10 |

- .2 Low pitch roof:

| Number of fasteners | Panel length |
|---------------------|--------------|
| 2 | 25 |

- .2 Panel Clips: 18-gauge Zinalume steel, 3-1/2 inches wide, 1-7/8 inch high, spacing at 2 feet. #10 screws passing completely through plywood.
 - .3 Touch-up Paint: as recommended by factory applying pre-finished paint to roofing panels.
 - .4 Closures: Z-Flashings; gauge and finish equal to or better than that of roofing panels.

- .5 Sealant: Single-component urethane caulking.
- .6 Flashing: Gauge and finish to match roofing panels.

2.6 Fabrication

- .1 Unless otherwise shown on the drawings or specified herein, fabricate panels in continuous one-piece lengths and fabricate flashings and accessories in longest practical lengths, avoid lengths of flashings under 2' unless consultant states otherwise.

PART 3 - EXECUTION

3.1 Preparation

- .1 Field-verify all dimensions.
- .2 Install new field underlay/slip sheet to surface of substrate. Lap up/over penetrations and curbs to provide fully-sealed roof system.

3.2 Examination

- .1 Report improperly aligned, levelled or plumbed supports to the Consultant before proceeding with the Work, so that necessary corrections can be made.

3.3 Installation

- .1 Turn roof panel upper ends at least 1-1/2 inches up without cutting (bread panned) under flashing.
- .2 Install panel seams vertically, lapping panels away from prevailing wind direction.
- .3 Fully engage interlocking seams without causing warping or deflection.
- .4 Adjust metal roofing systems to final position before fastening permanently to structural supports.
- .5 Use concealed fastener and clip system in accordance with manufacturer's instructions; do not use exposed fasteners where entire roofs are to be replaced.
- .6 Lap ends by minimum 4 inches; locate end laps over supports.
- .7 Extend roof panels to overlap gutter openings by 1 ½" inches, without restricting accessibility for cleaning.
- .8 Exercise care when cutting or drilling pre-finished materials to ensure that cuttings do not remain to rust on exposed pre-finished surfaces. Where practical, cut and drill so that cuttings do not strike or accumulate on exposed cladding surfaces. Hand trim edges cut with an abrasive blade.
- .9 Maximum alignment variation: 1/4 inch in 40 feet.

END OF SECTION



PART 1 - GENERAL

1.1 Summary

- .1 Section Includes: Materials, preparation and installation of sealant.

1.2 References

- .1 Applicable Building Codes / Building By-laws, most recent edition.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C834 Standard Specification for Latex Sealants
 - .2 ASTM C919 Standard Practice for Use of Sealants in Acoustical Applications.
 - .3 ASTM C920 Standard Specification for Elastomeric Joint Sealants.
 - .4 ASTM C1184 Standard Specification for Structural Silicone Sealants
 - .5 ASTM C1193-05a Standard Guide for Use of Joint Sealants

1.3 Submittals

- .1 Samples: submit samples of each type of sealant material and colour.
- .2 Submit manufacturer's product data for all sealants and accessories, including:
 - .1 Materials compatibility information.
 - .2 Product Material Safety Data Sheets (MSDS).
 - .3 Manufacturer's installation instructions, surface preparation and product limitations.

1.4 Quality Assurance

- .1 Ensure sealant is properly adhered to substrate, whether primer is used or is not used.
- .2 Mock-Ups:
 - .1 Prepare mock-ups in accordance with Section 01 40 00, Quality Requirements.
 - .2 Show location, size, shape and depth of joint(s), complete with backup material and primer, if used. Mock-ups may be included as part of the finished work.
 - .3 Repair sealant where Consultant has performed pull testing to confirm adhesion.

1.5 Environmental and Safety Requirements

- .1 Comply with Workplace Hazardous Materials Information System (WHMIS) requirements for use, handling, storage and disposal of hazardous materials, and with labelling and provision of material safety data sheets in accordance with Canada Labour Code requirements.
- .2 Arrange for ventilation system to be operated on maximum outdoor air and exhaust during installation of caulking and sealants.

1.6 Project/Site Conditions

- .1 Do not proceed with the installation of joint sealants under the following conditions:
 - .1 When ambient and substrate temperature conditions are outside limits permitted by the joint sealant manufacturer or are below 4.4 degrees C.
 - .2 When joint substrates are wet or frost-laden.

PART 2 - PRODUCTS

2.1 Materials

- .1 Only sealants listed on CGSB Qualified Products List issued by CGSB Qualification Board for Joint Sealants are acceptable for use on this project. Where sealants are qualified with primers, use only these primers.
- .2 Compatibility of materials is essential. Ensure compatibility of sealant with adjacent materials and components prior to application.
- .3 Sealant colour to closely match adjacent finishes unless otherwise specified.
- .4 Sealants:
 - .1 Sealant Type 1: Polyurethanes, single-component, non-sag. Acceptable materials:
 - .1 Tremco Dymonic FC
 - .2 Sikaflex 1a
 - .2 Sealant Type 2: Polyurethanes, multi-component, non-sag. Acceptable materials:
 - .1 Tremco Dymeric 240
 - .2 Sikaflex 2c NS
 - .3 Sealant Type 3: Silicone, single-component, non-sag. Acceptable materials:
 - .1 Tremco Spectrem 1
 - .2 Tremco Spectrem 2
 - .3 Tremco Tremsil 600
 - .4 Dow Corning 790
 - .5 Dow Corning 795
 - .6 Dow Corning Contractors Weatherproofing Sealant
 - .4 Sealant Type 4: Silicone, single-component, neutral cure for high-temperature application. Acceptable material:
 - .1 Dow Corning Hi-Temp
 - .2 TVM High Temperature Silicone
 - .3 NuFlex 302
 - .5 Sealant Type 5: Thermoplastic synthetic rubber, single-component. Acceptable materials:
 - .1 Sealant Type 5a:
 - .1 Guertin GS1010

- .2 Tremco 830
- .2 Sealant Type 5b:
 - .1 OSI Pro-Series QUAD
- .6 Sealant Type 6: Flexible synthetic rubber, single-component, non-skinning, non-hardening. Acceptable materials:
 - .1 Tremco Acoustical Sealant
- .7 Sealant Type 7: Paintable latex sealant. Acceptable materials:
 - .1 DAP DYNAFLEX 230
 - .2 Tremco Tremflex 834

2.2 Components

- .1 Exterior Sealant Joints:
 - .1 Widths less than 1/2": Sealant Type 1 or Type 3.
 - .2 Widths greater than 1/2": Sealant Type 2 or Type 3.
- .2 Window and door frame exterior perimeters: Sealant Type 1 or Type 3.
- .3 Sealant locations where high-temperature sealants are required: Sealant Type 4.
- .4 Window and door frame interior perimeters: Sealant Type 5a.
- .5 Exterior SA membrane to breathable air barrier membrane interfaces: Sealant Type 5a.
- .6 Exterior air barrier membrane to air barrier membrane interfaces: Sealant Type 5b.
- .7 Interior polyethylene air/vapour barrier sealant: Sealant Type 6.
- .8 Acoustical sealing of drywall partitions, corridors and party walls: Sealant Type 6.
- .9 Interior finish sealant: Sealant Type 7.

2.3 Accessories

- .1 Primer: As recommended by sealant manufacturer and as required to achieve adhesion.
- .2 Backup Material: Foam backer rod as recommended by sealant manufacturer, compatible with sealant and sized to achieve correct joint depth and shape with approximately 30 percent compression.
- .3 Bond Breaker Tape: Polyethylene bond breaker tape to which sealant will not bond.
- .4 Joint Cleaner: Non-corrosive and non-staining type compatible with joint forming materials and sealant, as recommended by sealant manufacturer.

PART 3 - EXECUTION

3.1 Protection

- .1 Protect installed work and adjacent surfaces from staining or contamination by the work of this section.

3.2 Examination

- .1 Examine joint surfaces to ensure that they are sound, clean, dry, and free from old sealant, dirt, dust, rust, oil, grease and other contaminants that may impair adhesion.
- .2 Examine joint sizes and conditions to establish correct depth-to-width ratio for installation of backup materials and sealants.

3.3 Preparation

- .1 Prepare surfaces in accordance with sealant manufacturer's instructions.
- .2 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .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.

3.4 Priming

- .1 Prime joint surfaces in accordance with sealant manufacturer's instructions immediately prior to applying sealant.

3.5 Backup Material

- .1 Apply bond breaker tape where required in accordance with manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30 percent compression.

3.6 Sealant

- .1 Mixing: Mix materials in strict accordance with sealant manufacturer's instructions.
- .2 Application:
 - .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 as recommended by sealant manufacturer, using gun with proper-size nozzle.
 - .5 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets and embedded impurities.

- .6 Tool exposed surfaces in accordance with sealant manufacturer's instructions, with sufficient pressure to fill voids and joints solid, before skinning begins to give slightly concave shape.
- .7 Promptly remove excess sealant as work progresses and upon completion.
- .3 Curing:
 - .1 Cure sealants in accordance with manufacturer's instructions.
 - .2 Do not cover up sealant before it is fully cured.

3.7 Cleaning

- .1 Clean adjacent surfaces immediately and leave work neat and clean.
- .2 Remove excess and droppings, using manufacturer-recommended cleaners as work progresses.
- .3 Remove masking tape after initial set of sealant.

END OF SECTION

PART 1 - GENERAL

1.1 Summary

- .1 Supply and installation of fibre-reinforced gypsum board to low-sloped roof between pitched metal roofs at Building 27, Granville Island.

1.2 References

- .1 Applicable Building Code / Building By-Law, most recent edition.
- .2 Roofing Contractors Association of British Columbia (RCABC) *Roofing Practices Manual*.
- .3 ASTM E84-09c *Standard Test Method for Surface Burning Characteristics of Building Materials*.

1.3 Submittals

- .1 Before commencing the Work, provide to the Consultant and Owner the following:
 - .1 Written declaration that roofing materials and components are compatible and provided by same manufacturer
 - .2 Submit document issued by CSA certifying that roofing system offered meets requirements of CAN/ULC-S107-03 *Standard Methods of Fire Tests of Roof Coverings Class C*.
 - .3 Material Safety Data Sheets (MSDS) for review and posting on job site.
 - .4 Product literature, including product information sheets, installation instructions, restrictions, limitations, and other manufacturer recommendations.
 - .5 Warranty certificates, copies of insurances, business licence, and proof of confirmed applicator status.

1.4 Quality Assurance

- .1 Employ skilled applicators approved by membrane manufacturer.
- .2 Conform to latest RCABC Guarantee Standards for 5-year guarantee.
- .3 Use only materials listed in RCABC Accepted Materials List in RCABC *Roofing Practices Manual*.
- .4 Roofing supervisor to be present on site at all times during execution of roofing work. Roofing supervisor to have roofing trade qualification or equivalent, plus minimum 5 years' experience in roofing work of similar nature and scope as specified herein.

1.5 Delivery, Storage and Handling

- .1 Store materials elevated from contact with ground and moisture and protected from weather.
- .2 Where climatic conditions warrant, store overlay boards in heated enclosures prior to use, as recommended by manufacturer; bring only enough boards for immediate use to work area.
- .3 Install only dry overlay boards, and ensure overlay boards are kept dry before, during, and after application.

1.6 Project/Site Conditions

- .1 Weather conditions permissible for roofing are subject to the discretion of the roofing contractor and the Consultant, except that in no case shall roofing work be carried out under the following conditions:
 - .1 When temperature of substrate or air is lower than or is forecast to drop below 2 degrees C during course of the Work.
 - .2 During wet weather, forecasted imminent wet weather, or when site conditions have been adversely affected by recent wet weather.
- .2 Work in easily manageable sections and as quickly as possible to minimize exposure of roof deck.
- .3 Maintain roof in weather-tight condition when not performing roofing work.

1.7 Warranty

- .1 Refer to Section 01 78 36 Warranties.

PART 2 - PRODUCTS

2.1 Fibre-reinforced Gypsum Overlay Boards

- .1 Use only components supplied or accepted by overlay and membrane manufacturer.
- .2 4-foot by 8-foot fibre-reinforced gypsum roofing overlay board, composed of water-resistant treated gypsum core formed between two fibreglass mat liners.
- .3 Approved Product: SecuRock manufactured by CGC.
- .4 Thicknesses:
 - .1 Over rigid insulation: 3/8 inch.

2.2 Fasteners

- .1 Screws: corrosion-resistant #14 roofing fasteners, 13 threads per inch, self-drilling points. #03 Phillips-head drive, with sufficient length to provide a minimum 3/4-inch projection through roof deck.
 - .1 Approved product: DEKFAST #14 with Sentri Coating by Construction Fasteners Inc.
- .2 Insulation Plate: Hex-shaped insulation corrosion-resistant steel plates; minimum outside diameter of 2-7/8 inches and Nominal 0.020 inches in thickness.
 - .1 Approved Product: DEKFAST Galvalume Steel Hex Insulation Plates M7550 by Construction Fasteners Inc.

PART 3 - EXECUTION

3.1 Examination

- .1 Carefully examine substrates. Report any and all observed deficiencies that cannot be corrected after the Work is completed or that may adversely affect the performance or appearance of the Work.

- .2 Ensure substrate is clean, smooth, free of sharp objects, and suitable to receive the overlay board.

3.2 General

- .1 Conform to manufacturer's printed recommendations and installation instructions, in particular those pertaining to fire safety precautions.
- .2 Apply sheets straight and uniform.
- .3 Cut and measure all overlay board to provide clean, straight, and uniform edges.

3.3 Overlay Board over Rigid Foam Insulation

- .1 Use maximum lengths possible to minimize joints
- .2 Install overlay board to surface of rigid foam insulation in moderate contact (without forcing); stagger end joints. Butt ends and edges.
- .3 Install overlay board perpendicular to rigid insulation below, with joints offset from joints of insulation below.
- .4 Mechanically attach overlay board with the specified screws and plates at a rate of 16 per 4-foot by 8-foot board.

3.4 Cleaning and Protection

- .1 Routinely clear roof areas of rubbish and other materials that may hinder installation or performance, or present a fire or safety hazard.

END OF SECTION