Requisition No:_____

SPECIFICATIONS for

FORMER TERRITORIAL COURTHOUSE
PHASE 2.3 – STRUCTURAL & ROOF UPGRADE
DAWSON YT

Project No. Pro 842

January 2021

APPROVED BY:

Regional Manager, AES	Date
Construction Safety Coordinator	Date

TENDER:

Project Manager	Date

Parks Canada

PART 1- SPECIFICATIONS

PART 2- DRAWINGS

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Structural Drawings:

END OF SECTION

ARCHITECTURE	STRUCTURAL
REGISTERED ARCHITECT HAAKEN JERRY SISE DEC 18 2020 BRITISH COLUMBIA	PROFESSIONAL YUKON PETR POLIVKA TERRITORY 144902460 ENGINEER December 18,2020 PERMIT TO PRACTICE STANTEC ARCHITECTURE LTD. Signature Date December 18, 2020 PERMIT NUMBER: PP315 Association of Professional Engineers of Yukon 144902460

END OF SECTION

PART 1 GENERAL

1.1 Definitions – Agreement, Participants and Continuity

.1 Work of this project will be executed under a "Fixed Price" Agreement between the Government of Canada, the Owner, hereinafter called the "Departmental Representative" and the Contractor.

.2 Architectural and Engineering Consultants will also be referred to as the "Departmental Representative".

1.2 Authorities and Permits

.1 Perform Work in accordance with the National Building Code of Canada (NBCC), 2015, and any other code of provincial or local application. In any case of conflict or discrepancy, the more stringent requirements shall apply.

.2 Obtain a building permit and other permits from the Government of Yukon Territory, or Any Other Authority Having Jurisdiction, as applicable. All Permit fees shall be borne by the Contractor.

1.3 Description of Work

Phase 2 work on Dawson Territorial Courthouse, 301 Front Street, Dawson, YT, Y0B 1G0.

.1 Background Information: The Former Territorial Courthouse, designated a 'Classified' Federal Heritage Building, managed by Parks Canada, is a landmark in the Klondike National Historic Site. It was originally constructed in 1901, and subsequently added to, and extensively renovated on the interior numerous times. The work under this contract is the second phase of the intended Rehabilitation of the building.

.2 The Work includes, but is not limited to, the following general scope:

.1 Demolition & Abatement work:

.1 Selective demolition of interior and exterior building elements, as noted in the drawings and supporting documents, including removal of temporary shoring and bracing executed in Phase 1;

.2 Removal of the existing metal roof, membranes, and appurtenances, and as shown in the architectural drawings;

.3 Abatement of loose asbestos-containing materials (ACMs) (Vermiculite) in the existing building roof concealed spaces and balcony soffits;

.4 Careful removal of roof wood soffit material to suit the installation of continuous perforated metal vent, as detailed;

.2 Temporary Removal & Re-installation work:

.1 Careful tempoary removal & re-installation of existing Portico wood soffit

material, to facilitate the abatement of asbestos-containing materials;

.2 Careful temporary removal and re-installation of the existing heritage style metal roof gutters;

.3 Optional temporary removal and re-installation of existing roof sheathing, to suit the structural upgrade work;

.4 Replace materials damaged in removal with matching materials, to the satisfaction of the Departmental Representative;

.5 Refer to Section 02 41 00 – Selective Demolition for detailed procedures.

.3 Architectural & Structural work:

.1 Structural upgrades to the entire building;

.2 Replacement of existing standing seam metal roofing, including all associated vents, flashing and trim; new roof access hatch;

.4 Installation of the Front Entry Doors (provided by others) including casings and trims;

.5 Rooftop safety Fall Restraint System- low-profile track type, per roof plan & details.

.4 Provide full-time Fire Watch when the Fire Alarm system is disabled, including for the adjacent Carriage Shed. Recommission. Verify the Fire Alarm system at the completion of Phase 2 work. Provide a Fire Alarm System Impairment Plan for approval by the Departmental Representative before commencing work. Refer to Section 28 31 01- Fire Alarm Systems.

.3 Refer to documentary records of existing building conditions on drawing sheets A2.112 to A2.116, and in Appendixes D, E & F.

.4 Include all temporary means and facilities required to advance the work in a timely manner, and to keep the Courthouse & property safe and secure during the performance of the work. Refer to Section 01 51 00 - Temporary Facilities.

.5 Heritage- Special Conditions

.1 The Heritage Value of the building is embodied in its Character-Defining Elements, as outlined in the Statement of Significance and Heritage Character Statement (ref. Appendixes D & E).

.2 The Contractor shall exercise caution when working in proximity to significant Heritage components and finishes (Character Defining Elements and other items as noted in drawings). Refer to Section 01 14 00 – Work Restrictions, parts 1.5 & 1.6, for the minimum standards of care to be provided, and for the repair of damaged elements or materials;

.3 The Contractor shall provide a Heritage Protection Plan before the start of work, for approval by the Departmental Representative, per Section 00 14 00 part 1.5, and Section 01 51 00 parts 1.1 & 1.2.

.4 The Contractor shall attend a Heritage Orientation Meeting at the start of construction, provided by the Departmental Representative, for verbal guidance regarding the standards of care expected in the course of the work.

.5 The scope and procedures for demolition (removal and retention or disposal) are outlined in Section 02 41 00 – Selective Demolition;

.6 Roof Structural Survey: allow for a Surveyor, retained by the owner, to access the attic spaces when interior demolition is complete, in order to gather elevation data for addition to Appendix F;

.7 Photographic Documentation

Provide photographic documentation per Section 01 32 33 for the Conservation Treatment work (under Section 06 03 20 – Conservation Treatment For Period Finish Carpentry) at 2 Dormers, fascia and soffits, and front entry door rehabilitation.

.8 Covid-19 Measures

.1 Contractor costs associated with compliance with occupational health and safety requirements related to the Coronavirus/COVID-19 pandemic must be included in the Contractor's initial bid price. These costs may include, but are not limited to, the provision of additional personal protective equipment (PPE), accommodating social distancing requirements on work sites, cleaning protocols, etc. as required to complete the project.

.2 The Contractor must review and incorporate into initial bid pricing their compliance with any Coronavirus/COVID-19 related health and safety guidance or mandatory requirements issued by the local Medical Officer of Health (applicable in the jurisdiction of the project), the Public Health Agency of Canada, Health Canada and/or the territorial Ministry of Health.

.3 Parks Canada will not reimburse the Contractor for costs associated with mandatory self-isolation requirements, supply chain delays, or other COVID-19 related requirements in place at the time of bid submission.

.4 Comply also with Sections 01 14 00 – Work Restrictions and Section 01 35 33 – Health & Safety Requirements.

1.4 Contract Documents

.1 The Contract documents, drawings and specifications are intended to complement each other.

.2 Drawings are, in general, diagrammatic and are intended to indicate the scope and general arrangement of the work.

1.5 Division of Specifications

.1 The specifications are subdivided in accordance with the current 6-digit National Master Specifications System.

.2 A division may consist of the work of more than one subcontractor. Responsibility for determining which subcontractor provides the labour, material, equipment and services required to complete the work rests solely with the Contractor.

.3 In the event of discrepancies or conflicts when interpreting the drawings and specifications, the specifications shall govern.

1.6 Time of Completion

.1 Refer to Contract.

1.7 Work Schedule

.1 Carry out work as follows:

.1 Provide a detailed "phasing bar gantt chart" and a schedule showing key milestones, anticipated progress stages and final completion of the work within the time period required by the Contract documents. Indicate the following:

.1 Submission of shop drawings, product data, MSDS sheets and samples;

.2 Commencement and completion of work of each section of the specifications or trades for each stage of the work;

.3 Dates of Mock-up or Sample Installation reviews;

.4 Final completion date within the time period required by the Contract documents.

.2 Do not change approved Schedule without notifying Departmental Representative.

.3 Interim reviews of work progress based on work schedule will be conducted as decided by Departmental Representative and schedule updated by Contractor in conjunction with and to approval of Departmental Representative.

.4 The Contractor's schedule of work to meet project milestones shall consider any and all expected delays due to supply chain interruptions and Federal/Territorial public health measures, such as mandatory self-isolation requirements upon entry into the Yukon Territory. Parks Canada Agency will not reimburse the Contractor for costs associated with delays as a result of COVID-19 restrictions or interruptions.

1.8 Schedule of Values

.1 Provide, min. 1 week prior to submitting the first contract Request for Progress Payment, a Schedule of Values for each of the following portions of the work, summarized as the Total Contract Value (not including GST):

1.	Div. 2	Demo & Hazmat work	$
2.	Divs. 3-6	Structural Levelling work	$
3.	Divs. 3-6	Structural Upgrade work *(except next item)*	$
4.	Section 06 03 20 – Conservation Treatment		$
5.	Divs. 7-9	Building Envelope work *(except next 2 items)*	$
6.	Section 07 41 00 - Metal Roof Cladding		$
7.	Section 07 72 26 – Fall Restraint System		$
8.	Section 28 31 01 – Fire Alarm Systems		$
9.	Div. 1	General Conditions	$
10.	Div. 0	Profit	$
11.	Total Contract Value		$

1.9 Hours of Work

.1 Refer to Section 01 14 00 – Work Restrictions.

1.10 Codes, Bylaws, Standards

.1 Perform work in accordance with:

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

.2 Other indicated Codes, Construction Standards and/or any other Code or Bylaw of local application.

.2 Comply with applicable local bylaws, rules and regulations enforced at the location concerned.

.3 Meet or exceed requirements of Contract documents, specified standards, codes and referenced documents.

.4 In any case of conflict or discrepancy, the most stringent requirements shall apply.

1.11 Documents Required

.1 Maintain one copy each of the following at the job site:

.1 Contract drawings.
.2 Contract specifications.
.3 Addenda to Contract documents.
.4 Copy of work schedule.
.5 Reviewed/approved shop drawings.
.6 Change Orders.
.7 Other modifications to Contract.
.8 Field test reports.
.9 Reviewed/approved samples.
.10 Manufacturer's installation and application instructions.
.11 Ongoing marked-up "red-line" record drawings and specifications for As-Built purposes.
.12 National Building Code of Canada 2015.

1.12 Contractor's Use of Site

.1 Use of site:

.1 Work on site will be under the control of the Contractor, subject to all Contract conditions;

.2 Assume responsibility for assigned premises for performance of the Work.

.2 Contractor Staging Area and Access to the Site: refer to Site Plan and Section 01 51 00

Temporary Facilities;

.3 Do not unreasonably encumber site with material or equipment.

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

.5 Maintain existing services to in-use facilities.

.6 Where security is reduced by work, provide temporary means to maintain security per Departmental Representative's direction and as specified.

.7 Closures: protect work temporarily until project is completed.

.8 Contractor is responsible to coordinate with the neighbour to the north (RCMP) for access to the site and use of their land for contractor parking and material delivery access, as needed for the performance of the work

1.13 Examination

.1 Examine site and be familiar and conversant with existing conditions likely to affect work. Refer also to Section 01 51 00.

1.14 Work Restrictions and Security

.1 Refer to Section 01 14 00.

1.15 Location of Equipment and Fixtures

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space, and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Departmental Representative of impending installation and obtain his approval for actual location.

.4 Submit field drawings or shop drawings to indicate the relative position of various services and equipment when required by the Departmental Representative and/or as specified.

1.16 Cutting and Patching

.1 Do not cut any element of the building without prior approval of the Departmental Representative, unless specifically noted in the contract documents.

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1.17 Acceptance of Substrates

.1 Each trade shall examine surfaces prepared by others and job conditions which may affect his work, and shall report defects to the Contractor. Commencement of work shall imply acceptance of prepared work or substrate surfaces

1.18 Quality of Work

.1 Ensure that quality workmanship is performed through use of skilled tradesmen, under supervision of qualified journeyman.

.2 The workmanship, erection methods and procedures to meet minimum standards set out in the National Building Code of Canada 2015.

1.19 Works Coordination

.1 Coordinate work of sub-trades:

.1 Designate one person to be responsible for review of contract documents and shop drawings and managing coordination of Work.

.2 Convene meetings between subcontractors whose work interfaces and ensure awareness of areas and extent of interface required.

.1 Provide each subcontractor with complete plans and specifications for project, to assist them in planning and carrying out their respective work.

.2 Develop coordination drawings when required, illustrating potential interference between work of various trades and distribute to affected parties. And provide a copy of the coordination drawings to Departmental Representative for record.

.1 Pay particularly close attention to overhead work above ceilings and within or near to building structural elements.

.2 Identify on coordination drawings, building elements, service lines, rough-in points and indicate location services entrance to site.

.3 Facilitate meeting and review coordination drawings.

.4 Record and Publish meeting minutes of each meeting within in 3 days after the meeting.

.5 Plan and coordinate work in such a way to minimize quantity of service line offsets.

.6 Submit copy of coordination drawings and meeting minutes Departmental Representative for information purposes.

.3 Submit shop drawings and order of prefabricated equipment or rebuilt components only after coordination meeting for such items has taken place.

.4 Work cooperation:

.1 Ensure cooperation between trades in order to facilitate general progress of Work and avoid situations of spatial interference.

.2 Ensure that each trade provides all other trades reasonable opportunity for completion of Work and in such a way as to prevent unnecessary delays, cutting, patching and removal or replacement of completed work.

.3 Ensure that disputes between subcontractors are resolved.

.5 Departmental Representative is not responsible for, nor accountable for extra costs incurred as a result of Contractor’s failure to coordinate Work.

.6 Maintain efficient and continuous supervision.

.7 Coordinate and cooperate with institution staff where new work interfaces with active institution equipment and operation.

1.120 Construction Coordination Meetings

.1 The Departmental Representative will arrange for Construction Coordination Meetings to be held at regular, mutually agreeable dates and times (typically minimum every 2 weeks, or as suits the progress of the Work) for the duration of the Contract. Meetings shall be either in person on site, or by teleconference call. The Contractor shall attend all such meetings.

.2 The Departmental Representative will record and distribute of Minutes of meetings.

1.21 Testing and Inspections

.1 Particular requirements for inspection and testing to be carried out, by testing service or laboratory approved by the Departmental Representative, are specified in individual Sections. Refer also to Section 01 45 00 – Quality Control.

.2 The Contractor will appoint and pay for the services of testing agency or testing laboratory as specified and where required for the following:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Testing, adjustment and balancing of mechanical and electrical equipment and systems.

.1 Mill tests and certificates of compliance.

.2 Tests specified to be carried out by Contractor under the Departmental Representative's supervision.

.3 Where tests or inspections by designated testing laboratory reveal work is not in accordance with the Contract requirements, Contractor shall pay costs for additional tests or inspections as the Departmental Representative may require to verify acceptability of corrected work.

.4 Contractor shall furnish labour and facilities to:

.1 Notify Departmental Representative in advance of planned testing.

.5 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.6 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Departmental Representative.

.7 The Departmental Representative may require, and pay for, additional inspection and testing services not included in Paragraph 1.20.2 above.

.8 Provide Departmental Representative with two copies of testing laboratory

reports as soon as they are available.

1.22 As-Built Documents

.1 Refer to Section 01 78 30 Closeout Submittals.

1.23 Cleaning

.1 Refer to Section 01 74 00 – Cleaning.

1.24 Dust & Debris Control

.1 Ensure daily that sawdust and debris from rehabilitation work is contained to the immediate work area, and collected (sweep or vacuum) & removed daily.

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

1.25 Environmental Protection

.1 Refer to Sections 01 35 43 and 01 74 21, and Division 2.

.2 Ensure that building envelope is weathertight and that building interior has been allowed to dry before installation of interior components.

1.26 Maintenance Materials, Special Tools and Spare Parts

.1 Specific requirements for maintenance materials, tools and spare parts are specified in individual technical sections of specifications. Refer to Section 01 78 30 – Closeout Submittals.

1.27 Special Consultants

.1 In addition to the Departmental Representative's Architectural and Engineering Consultants, the Contractor shall engage and pay for any other Consultants needed in the performance of the work.

.2 Various specifications sections require Yukon Territory Registered Professional Engineers ("Specialty Engineers") to prepare, sign and seal shop drawings, submit Letters of Assurance and perform Field Services as required. Payment of Specialty Engineer services shall be included in the cost of the appropriate work.

1.28 Additional Drawings

.1 The Departmental Representative may furnish additional drawings for clarification, to further site instruction. These additional drawings have the same meaning and intent as if they were included with drawings referenced in the Contract documents.

END OF SECTION

Part 1 GENERAL

1.1 CONTROL AND AUTHORITY OVER SITE

.1 Work on site will be under the control of the Contractor for the duration of the Contract.

.2 Comply with any Coronavirus/COVID-19 related health and safety guidance or mandatory requirements issued by the local Medical Officer of Health (applicable in the jurisdiction of the project), the Public Health Agency of Canada, Health Canada and/or the territorial Ministry of Health.

3. The Contractor shall follow, at minimum, the Canadian Construction Association "COVID-19 – Standardized Protocols for All Canadian Construction Sites".

1.2 ACCESS AND EGRESS

.1 All construction, staff and delivery vehicles accessing contractor's lay-down area and parking zones shall follow routes as designated on the Site Plan.

1.3 HOURS OF WORK

.1 The Contractor may set it's own schedule of work on site, to follow Municipal regulations. Submit proposed hours-of-work to Departmental Representative for review and approval along with schedule outlined in Section 01 11 55.

1.4 USE OF SITE AND FACILITIES

.1 Maintain existing services and abide by regulations for personnel and vehicle access.

.2 Where security is reduced by work, provide temporary means to maintain security as per Departmental Representative's direction and as specified. Protect work temporarily until project is completed.

.3 Areas under construction must be separated by temporary fencing or hoarding (refer to Section 01 51 00), and should not utilize any more space in the Contractor's lay-down area than what is absolutely necessary.

.4 All excavation will need to be planned in advance with Parks Canada. PC representative will need to be on site.

.5 Hot Work: no hot work to be inside of building.

1.5 HERITAGE CONSIDERATIONS

.1 Retain and protect the Heritage Value of the building as embodied in its Character-Defining Elements, as outlined in the Statement of Significance and Heritage Character Statement (ref. Appendix D), and as listed in Section 01 51 00 – Temporary Facilities, part 1.2.2.

.2 The Contractor shall undertake the Work with temporary provisions for the protection of Character-Defining Elements, as noted in the drawings, and per Section 01 51 00 – Temporary Facilities, parts 1.2.1, 1.2.2 & 1.2.3.

.3 Provide a Heritage Protection Plan per Section 01 51 00 part 1.1 & 1.2, for approval by the Departmental Representative, before starting the work.

.4 Do not remove, replace or substantially alter any Character-Defining Elements. Obtain Departmental Representative approval prior to any deviation from the work as specified.

1.6 REPAIR OF DAMAGED HERITAGE ELEMENTS

.1 If the performance of the Work creates debris on or damage to a Character Defining Element, it shall be cleaned and/or reinstated to its original condition under the direction of the Departmental Representative, and if damaged it shall be repaired or replaced to the satisfaction of the Departmental Representative by the Contractor, at no cost to the Departmental Representative.

.2 Damage to such elements by the Contractor, requiring repair or replacement, may be an involved process requiring input from specialists and possible repair work by the Departmental Representative's own forces. This process may involve additional input or approval from the appropriate authorities concerning methods & materials prior to any repair work. Damage to these elements may cause delays in construction and increases in cost that will be borne by the Contractor. Exercising due caution when working on the National Historic Site is recommended.

.3 In the event of damage occurring to heritage elements during course of work:

.1 The finder shall immediately stop all work in the area of the damage and contact the on-site Departmental Representative to inform them of the damage verbally, followed by a written communication;

.2 The Contractor shall immediately inform the Departmental Representative's Project Design and Heritage Consultants, together with any other appropriate project team members. This notification shall include a "Heritage Material Condition Report" including the following minimum information: date, reason for report, location (key plan and elevation as applicable), a brief description of damaged element, a brief outline about the damage (written and photo), a description of the contracted work that resulted in the damage;

.3 If work around the damaged heritage element is risking life safety or risking/causing damage to additional heritage element(s), this work shall stop immediately except for any work necessary to stabilize the work area for health and life safety reasons and to safeguard the damaged heritage element. All adjacent heritage elements shall be checked for damage and for characteristics that would make them susceptible to similar damage. The damaged heritage component shall be maintained in closest proximity to the damage site until input is provided by the Departmental Representative regarding next steps.

.4 The damaged heritage element shall be provided with temporary protection as required until it can be viewed by appropriate built heritage conservation personnel as identified by the Departmental Representative. Temporary

protection measures shall be put in place to ensure that further damage to the heritage element is minimized.

1.7 CHANCE FIND PROTOCOL

.1 Definitions

.1 Cultural Resource: a human work, an object or a place that is determined, on a basis of its heritage value, to be directly associated with an important aspect or aspects of human history or culture.

.2 Archaeological site: a location that contains physical remains of past human activity.

.3 Archaeological site: a location that contains physical remains of past human activity.

.4 Traditional Use site: Landforms, natural features, cultural features or other locations of spiritual, cultural or other significance to an Indigenous community.

.2 Regulatory Overview

.1 Comply with all applicable laws, regulations and requirements of Federal, Provincial, and other regional authorities, and acquire and comply with such permits, approvals and authorizations as may be required.

.2 Parks Canada ensures that archaeological resources are protected and managed appropriately in accordance with its mandate, Cultural Resource Management Policy, Guidelines for the Management of Archaeological Resources and management directives. Ensuring adequate management of archaeological resources consists mainly of preventing or reducing the impact of anything that can affect the historical value of archaeological sites and collections

.3 General

.1 Artifacts, features, relics, antiquities, and items of both prehistoric and historical value and any objects found on the work site that may be considered artifacts, regardless of condition, shall be reported to the Departmental Representative immediately. The contractor and workers shall wait for the instruction before proceeding with their work.

.2 All archaeological or historical objects found are protected under the Canada National Parks Act. The Contractor and workers shall stop work and protect any artifacts and / or features found and request direction from the Departmental Representative. No archaeological or historical objects shall be intentionally moved. It is illegal to remove archaeological or historical objects from the National Historic Site

.3 Due to the sensitivity of the cultural resources, information about all cultural materials, archaeological sites and locations is confidential. No photographs or information about cultural sites and/or resources will be made public by the contractor or sub-contractors.

1.8 NOISE GENERATION

.1 Follow local standards & limitations for noise generated by the work.

1.9 EXISTING SERVICES

.1 Contractor shall maintain building service connections.

1.10 BUILDING SMOKING ENVIRONMENT

.1 Smoking is NOT permitted within the existing buildings or within 6 meters of any entrance, open windows or air intakes.

1.11 SECURITY CONTROL

.1 The Contractor will have control of the buildings, and of the portion of the property secured by the Contractor, for the duration of the work.

END OF SECTION

Part 1 General

1.1 INTENT

.1 Provide digital photographs of buildings, grounds, and site features to record existing conditions prior to, during, and at completion of Conservation Treatment work, per Section 06 03 20.
.2 Use digital camera with capability of producing digital images at minimum 5.0 megapixels, uncompressed, saved in *.jpeg format.
.3 Name photos identifying building name and photo location.

1.2 GENERAL

.1 Keep one set of photographs on site.
.2 Submit photographs to Departmental Representative on CD-disc, USB memory stick, or email as a WinZip file.
.3 Format:
  .1 Colour digital photos, fine resolution of minimum 4 megapixels.
  .2 RAW format for pre-construction, and post-construction.
  .3 PDF and JPEG format for construction progress photographs.
.4 Photograph Quality:
  .1 Well-illuminated, proper exposure.
  .2 Clarity: Sufficiently clear to distinguish differences in the pre-construction and post-construction photographs, and allow future reinstallation of restored items in the original locations.
.5 Indicate project name and number, and date photograph was taken on each photograph.
.6 Provide key plan and elevation drawings identifying location of photographs.
.7 Viewpoints: interior and exterior viewpoints, including close ups of specific details in locations as determined by the Departmental Representative.
  .1 Clearly establish viewpoints and identify them by numbering them with the same first number for the same viewpoint followed by a second number for each stage of work.
  .2 Example: 1.0 - preconstruction, 1.1 - after removal work, 1.2 - during restoration, 1.3- reinstallation, 1.4 - completed work.

1.3 PRE-CONSTRUCTION PHOTOGRAPHS

.1 Submit a complete photographic record of the condition of the existing building fabric (all materials and components) before start of Work.
.2 Do not start work in the location until the photographic record has been reviewed by the Departmental Representative.
.3 Number of images per set: as required to document each building, site feature, and area of Work.
.4 Number of sets: One set per building, site feature, or area of Work.

1.4 CONSTRUCTION PROGRESS PHOTOGRAPHS

.1 Provide photographs to record progress of the Work.
.2 Number of images per set: as required to document each building, site feature, and area of Work.
.3 Number of sets: One set per building, site feature, or area of Work.
.4 Frequency: Monthly with progress statement or as directed by Departmental Representative.

1.5 FINAL PHOTOGRAPHS

.1 Provide photographs at completion of Work to record condition of site features, surrounding buildings, and new construction.

.2 Number of images per set: as required to document each building, site feature, and area of Work.

.3 Number of sets: one.

END OF SECTION

PART 1 GENERAL

1.1 Approvals

.1 Approval of shop drawings and samples: refer to Section 01 11 55.

1.2 General

.1 This Section specifies general requirements and procedures for the Contractor's submissions of shop drawings, product data, samples and other requested submittals to Departmental Representative for review. Additional specific requirements for submissions are specified in individual technical sections.

.2 Present shop drawings, product data and samples in Metric dimensions.

.3 Where items or information is not produced in Metric dimensions, converted values are acceptable.

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

.5 Notify Departmental Representative in writing at time of submission, identifying deviations from requirements of Contract documents and stating reasons for deviations.

.6 Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by Departmental Representative's review of submission unless Departmental Representative gives written acceptance of specific deviations.

.7 Make any changes in submissions which Departmental Representative may require consistent with Contract documents and resubmit as directed by Departmental Representative.

.8 Notify Departmental Representative in writing, when resubmitting, of any revisions other than those requested by Departmental Representative.

.9 **Do not proceed with work until relevant submissions are reviewed, commented upon and returned to the Contractor by the Departmental Representative.**

1.3 Submission Requirements

.1 Coordinate each submission with the requirements of the work and the Contract documents. Individual submissions will not be reviewed until all related information is available.

.2 Allow (10) ten working days for Departmental Representative's review of each submission, unless noted otherwise.

.3 Accompany submissions with transmittal letter, in duplicate, containing:

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

.4 Submissions shall include:

- .1 Date and revision dates.
- .2 Project title and number.

.3 Name and address of:

.1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

.4 Contractor's stamp, signed by Contractor's authorized representative, certifying approval of submissions, verification of field measurements and compliance with Contract documents.

.5 Seal of Professional Engineer, registered in YT, for all items so required in the various sections of the specifications.

.6 Details of appropriate portions of work as applicable:

.1 Fabrication.

.2 Layout, showing dimensions (including identified field dimensions) and clearances.

.3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

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

1.4 Shop Drawings

.1 Shop drawings: original drawings or modified standard drawings provided by Contractor to illustrate details of portions of work which are specific to project requirements.

.2 Maximum sheet size: 850 x 1050 mm. (for hard copy submission).

.3 Submit electronic versions of shop drawings for each requirement requested in the specification sections and/or as requested by the Departmental Representative.

.4 Cross-reference shop drawing information to applicable portions of the Contract documents.

1.5 Shop Drawings Review

.1 Review of shop drawings by the Departmental Representative is for the sole purpose of ascertaining conformance with the general concept.

.2 This review shall not mean that the Departmental Representative approves the detail design inherent in the shop drawings, responsibility for which shall remain with Contractor submitting same.

.3 This review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and Contract documents.

.4 Without restricting the generality of the foregoing, the Contractor is responsible for:

.1 Dimensions to be confirmed and correlated at the job site.

.2 Information that pertains solely to fabrication processes or to techniques of construction and installation.

.3 Coordination of the work of all sub-trades.

1.6 Product Data

.1 Product data: manufacturers' catalogue sheets, MSDS sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products or any other specified information.

.2 Delete information not applicable to project.

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

.4 Cross-reference product data information to applicable portions of Contract documents.

.5 Submit 6 copies of product data.

1.7 Samples & Mock-ups

.1 Samples: examples of materials, equipment, quality, finishes and workmanship.

.2 Mock-Ups: examples of critical typical connections or transitions between different materials and/or building assemblies and details, confirming the proper configuration and sequence of materials and trades, to meet the design intent.

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

.3 **Reviewed and accepted samples and/or mock-ups will become the standard of workmanship and material against which installed work will be verified.**

1.8 Progress Schedule

.1 Submit a construction schedule/timeline and Schedule of Values as required in Section 01 11 55 – General Instructions.

1.9 Test Results and Inspection Reports

.1 Submit in duplicate test results and inspection reports required by specification sections where noted.

END OF SECTION

PART 1 GENERAL

0.0 COVID-19 MEASURES

1. Comply with any Coronavirus/COVID-19 related health and safety guidance or mandatory requirements issued by the local Medical Officer of Health (applicable in the jurisdiction of the project), the Public Health Agency of Canada, Health Canada and/or the territorial Ministry of Health.

2. The Contractor shall follow, at minimum, the Canadian Construction Association "COVID-19 – Standardized Protocols for All Canadian Construction Sites".

1.0 References

.1 Government of Canada.

- .1 Canada Labour Code – Part II
- .2 Canada Occupational Health and Safety Regulations

.2 National Building Code of Canada (NBC):

- .1 Part 8, Safety Measures at Construction and Demolition Sites.

.3 The Canadian Electric Code (as amended)

.4 Canadian Standards Association (CSA) as amended:

- .1 CSA Z797-2009 Code of Practice for Access Scaffold
- .2 CSA S269.1-1975 (R2003) Falsework for Construction Purposes
- .3 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures
- .4 CSA Z1006-10 Management of Work in Confined Spaces.
- .5 CSA Z462- Workplace Electrical Safety Standard

.5 National Fire Code of Canada 2010 (as amended)

- .1 Part 5 – Hazardous Processes and Operations and Division B as applicable and required.

.6 American National Standards Institute (ANSI):

- .1 ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.

.7 Yukon Territories:

- .1 Workers Compensation Act.
- .2 Occupational Health and Safety Act

.8 Specification Appendix C: Preliminary Hazard Assessment Form

2.0 Related Sections

.1 Refer to the following current NMS sections as required:

.1	General Instructions:	Section 01 11 55
.2	Work Restrictions:	Section 01 14 00
.3	Submittal Procedures:	Section 01 33 00
.4	Temporary Facilities:	Section 01 51 00
.5	Waste Management and Disposal:	Section 01 74 21
.6	Demolition:	Section 02 41 00
.7	Asbestos Abatement-Intermediate Precautions:	Section 02 82 00.02

3.0 Workers' Compensation Board Coverage

.1 Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.

.2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

4.0 Compliance with Regulations

.1 The Departmental Representative may terminate the Contract without liability to the owner where the Contractor, in the opinion of the Departmental Representative, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Act.

.2 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Act.

5.0 Submittals

.1 Submit to Departmental Representative submittals listed for review

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

.3 Submit the following:

.1 Site Specific Health and Safety Plan.

.2 Copies of reports or directions issued by federal and provincial health and safety inspectors.

.3 Copies of incident and accident reports.

.4 Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.

.5 Emergency Procedures.

.4 The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 2 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative for review.

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

.6 Submission of a Site Specific Health and Safety Plan to the Departmental Representative is for information and reference purposes only. It shall not:

.1 Be construed to imply approval by the Departmental Representative.

.2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.

.3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

6.0 Responsibility

.1 The Contractor shall assume responsibility as the “Constructor” for work under this contract, as defined by the applicable Health & Safety regulations;

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

.3 The Contractor shall comply with and enforce compliance by employees with safety requirements of Contract documents, applicable Federal, Provincial, Territorial and local statutes, regulations, and ordinances, and with Site-Specific Health and Safety Plan.

7.0 Health and Safety Coordinator

.1 The Health and Safety Coordinator must:

.1 Be responsible for completing all health and safety training, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the site to perform work.

.2 Be responsible for implementing, daily enforcing, and monitoring the Site-Specific Health and Safety Plan.

.3 Be on site during execution of work.

8.0 General Conditions

.1 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

.2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.

.1 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

.2 Secure site at night, or provide security guard, as deemed necessary to protect site against entry.

9.0 Project/Site Conditions

.1 Work at site will involve contact with:

.1 Multi-employer work site.

.2 Federal employees and general public.

.3 "Preliminary Hazard Assessment Form" , Appendix C

10. Utility Clearances

.1 The Contractor is solely responsible for all utility detection and clearances prior to starting the work

.2 The Contractor will not rely solely upon the Reference Drawings or other information provided for utility locations.

11. Regulatory Requirements

.1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.

.2 In event of a conflict between any provision of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will advise on the course of action.

12.0 Work Permits

.1 Obtain specialty trade permits related to project before start of work.

13.0 Filing Notice

.1 The Contractor is to complete and submit a Notice of Project as required by territorial authorities.

.2 Provide copies of all notices to the Departmental Representative.

14.0 Health and Safety Plan

.1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.

.2 Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:

- .1 Primary requirements:
  - .1 Contractor's safety policy.
  - .2 Identification of applicable compliance obligations.
  - .3 Definition of responsibilities for project safety/organization chart for project.
  - .4 General safety rules for project.
  - .5 Job-specific safe work, procedures.
  - .6 Inspection policy and procedures.
  - .7 Incident reporting and investigation policy and procedures.
  - .8 Occupational Health and Safety Committee/Representative procedures.
  - .9 Occupational Health and Safety meetings.
  - .10 Occupational Health and Safety communications and record keeping procedures.
- .2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.
- .3 List hazardous materials to be brought on site as required by work.
- .4 Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.
- .5 Identify personal protective equipment (PPE) to be used by workers.
- .6 Identify personnel and alternates responsible for site safety and health.
- .7 Identify personnel training requirements and training plan, including site orientation for new workers.

.3 Develop the plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors are included in the hazard assessment and are reflected in the plan.

.4 Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative prior to commencement of work on site.

.5 Departmental Representative's review: the review of Site Specific Health and Safety Plan by Public Works and Government Services Canada (PWGSC) shall not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract documents.

15.0 Emergency Procedures

.1 List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e. names/telephone numbers) of:

- .1 Designated personnel from own company.
- .2 Regulatory agencies applicable to work and as per legislated regulations.
- .3 Local emergency resources.
- .4 Departmental Representative(s) and site staff.

.2 Include the following provisions in the emergency procedures:

- .1 Notify workers and the first-aid attendant, of the nature and location of the emergency.
- .2 Evacuate all workers safely.
- .3 Check and confirm the safe evacuation of all workers.
- .4 Notify the fire department or other emergency responders.
- .5 Notify adjacent workplaces or residences that may be affected if the risk extends beyond the workplace.
- .6 Notify Departmental Representative and site staff.

.3 Provide written rescue/evacuation procedures as required for, but not limited to:

- .1 Work at high angles.
- .2 Work in confined spaces or where there is risk of entrapment.
- .3 Work with hazardous substances.
- .4 Underground work.
- .5 Work on, over, under and adjacent to water.
- .6 Workplaces where there are persons who require physical assistance to be moved.

.4 Design and mark emergency exit routes to provide quick and unimpeded exit.

.5 Revise and update emergency procedures as required, and re-submit to the Departmental Representative.

16.0 Hazardous Products

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labeling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.

.2 Where use of hazardous and toxic products cannot be avoided:

.1 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as per Section 01 33 00.

.2 In conjunction with Departmental Representative, schedule to carry out work during "off hours" when tenants have left the building.

.3 Provide adequate means of ventilation.

.4 The contractor shall ensure that the product is applied as per manufacturers recommendations.

.5 The contractor shall ensure that only pre-approved products are brought onto the work site in an adequate quantity to complete the work.

17. Asbestos Hazard

.1 Carry out any activities involving asbestos in accordance with applicable Territorial / Federal Regulations.

.2 Removal and handling of asbestos will be in accordance with applicable Territorial / Federal Regulations.

18. PCB Removals

.1 Mercury-containing fluorescent tubes and ballasts which contain polychorinated biphenyls (PCBs) are classified as hazardous waste.

.2 Remove, handle, transport and dispose of as indicated in Section [028400].

19. Removal of Lead- Containing Paints

.1 All paints containing TCLP lead concentrations above 5 ppm are classified as hazardous.

.2 Carry out demolition and/or remediation activities involving lead-containing paints in accordance with applicable Territorial Regulations.

.3 Dry Scraping/Sanding of any materials containing lead is strictly prohibited.

.4 The use of Methylene Chloride based paint removal products is strictly prohibited.

20. Silica Hazard

.1 Carry out any activities involving silica in accordance with applicable Territorial / Federal Regulations.

21.0 Electrical Safety Requirements

.1 Comply with authorities and ensure that, when installing new facilities or modifying existing facilities, all electrical personnel are completely familiar with existing and new electrical circuits and equipment and their operation.

.1 Before undertaking any work, coordinate required energizing and de-energizing of new and existing circuits with Departmental Representative.

.2 Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

22.0 Electrical Lockout

.1 Develop, implement and enforce use of established procedures to provide electrical, mechanical, pneumatic, hydraulic, chemical, thermal, or potential energy isolation and lockout and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.

.2 Prepare the lockout procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request/ authorization form. Have procedures available for review upon request by the Departmental Representative.

.3 Keep the documents and lockout tags at the site and list in a log book for the full duration of the Contract. Upon request, make such data available for viewing by Departmental Representative or by any authorized safety representative.

23.0 Overloading

.1 Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.

24.0 Falsework

.1 Design and construct falsework in accordance with CSA S269.1-1975 (R2003).

25.0 Scaffolding

.1 Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CSA-Z797-2009 and YT Regulations.

26.0 Confined Spaces

.1 Carry out work in confined spaces in compliance with Territorial Regulations.

27.0 Powder-Actuated Devices

.1 Use powder-actuated devices in accordance with ANSI A10.3 only after receipt of written permission from the Departmental Representative.

28.0 Fire Safety and Hot Work

.1 Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.

.2 Hot work includes cutting/melting with use of torch, flame heating roofing kettles, or other open flame devices and grinding with equipment which produces sparks.

29.0 Fire Safety Requirements

.1 Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

.3 Portable gas and diesel fuel tanks are not permitted on most federal work sites. Approval from the DR is required prior to any gas or diesel tank being brought onto the work site.

30.0 Fire Protection and Alarm System

.1 Refer also to Section 28 31 01

.2 Fire protection and alarm systems shall not be obstructed, shut off or left inactive at the end of a working day or shift unless full-time Fire Watch is provided, according to the approved Fire Alarm System Impairment Plan.

.4 Be responsible/liable for costs incurred from the fire department, the building owner and the tenants, resulting from false alarms.

31.0 Unforeseen Hazards

.1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and advise the Departmental Representative verbally and in writing.

32.0 Posted Documents

.1 Post legible versions of the following documents on site:

.1 Health and Safety Plan.

.2 Sequence of work.

.3 Emergency procedures.

.4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.

.5 Notice of Project.

.6 Floor plans or site plans.

.7 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.

.8 Workplace Hazardous Materials Information System (WHMIS) documents.

.9 Material Safety Data Sheets (MSDS).

.10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.

.2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.

.3 Postings shall be protected from the weather and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as approved by the Departmental Representative.

33.0 Meetings

.1 Attend health and safety pre-construction meeting and all subsequent meetings called by the Departmental Representative.

34.0 Correction of Non-Compliance

.1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.

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

.3 The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time. The General Contractor/subcontractors will be responsible for any costs arising from such a "stop work order".

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1	Section 01 33 00	Submittal Procedures
.2	Section 01 35 33	Health and Safety Requirements
.3	Section 01 51 00	Temporary Facilities
.4	Section 01 74 21	Waste Management and Disposal

1.2 DEFINITIONS

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.3 SUBMITTALS

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

.2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.

.3 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.4 Environmental protection plan: include:

- .1 Name[s] of person[s] responsible for ensuring adherence to Environmental Protection Plan.
- .2 Name[s] and qualifications of person[s] responsible for manifesting hazardous waste to be removed from site.
- .3 Name[s] and qualifications of person[s] responsible for training site personnel.
- .4 Descriptions of environmental protection personnel training program.
- .5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting

requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.7 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.

.9 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

.12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

1.4 FIRES

.1 Fires and burning of rubbish on site not permitted.

1.5 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.6 DRAINAGE

.1 Provide erosion and sediment control plan that identifies type and location of erosion and sediment controls to be provided. Plan: include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

.2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sedimentations control plan.

.3 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.4 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

.5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.7 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties where indicated.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2m.

.3 Protect roots of designated trees to drip line during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation.

.5 Restrict tree removal to areas indicated or designated by Departmental Representative.

1.8 WORK ADJACENT TO WATERWAYS

.1 Do not operate construction equipment in waterways.

.2 Do not use waterway beds for borrow material without Departmental Representative's approval.

.3 Do not dump excavated fill, waste material or debris in waterways.

.4 Design and construct temporary crossings to minimize erosion to waterways.

.5 Do not skid logs or construction materials across waterways.

.6 Avoid indicated spawning beds when constructing temporary crossings of waterways.

.7 Do not blast under water or within 100m of indicated spawning beds.

1.9 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract.

.2 Control emissions from equipment and plant to local authorities' emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area, by providing temporary enclosures.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.5 Comply with the Federal halocarbon Regulation (FHR) when installing or Decommissioning Equipment.

1.10 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative(s) of proposed corrective action and take such action for approval by Departmental Representative(s).

.3 Departmental Representative(s) will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Inspection and testing, administrative and enforcement requirements.

.2 Quality control program.

.3 Tests and mix designs.

.4 Mock-ups.

.5 Mill tests.

.6 Equipment and system adjust and balance.

1.2 RELATED SECTIONS

.1	Section 01 33 00	Submittal Procedures
.2	Section 01 61 00	Product Requirements
.3	Section 01 78 00	Closeout Submittals

1.3 GENERAL

.1 At Project commencement, establish quality assurance benchmarks and quality expectations for all workers and Subcontractors to follow.

.2 The Specification identifies a minimum level of quality, exceed this minimum level.

.3 Identify a person in the employ of the Contractor to monitor Work quality and to report quality assurance steps being taken, identified or discovered disparities, and corrective action taken.

.4 Submit written reports monthly to the Departmental Representative, to accompany progress claims.

.5 Monitor quality control over Suppliers, manufacturer's, Products, services, site conditions, and workmanship, to produce Work of specified quality.

.6 Comply with manufacturer's instructions, including each step in sequence. Should manufacturer's instructions conflict with Contract Documents, request clarification from Departmental Representative before proceeding.

.7 Comply with specified standards as minimum quality for the work except where more stringent tolerance, codes, or specified requirements indicate higher standards or more precise workmanship.

.8 Perform work with persons qualified to produce required and specified quality.

.9 Ensure that building envelope is weathertight during the course of construction.

1.4 QUALITY CONTROL PROGRAM

.1 Develop a quality control program. Program requires approval of the Departmental Representative and prior to commencement of Work.

.2 Within fourteen (14) days of award of Contract, submit five (5) copies of the quality control program and list of independent inspection agencies for review.

.3 Prepare all test results in triplicate and provide copies of all tests concurrently to the Departmental Representative and Contractor.

.4 All test results shall specify at least the following data:

.1 Type of test.

.2 Dates of sampling, testing and reporting.

.3 Personnel involved.

.4 Location of test (with sketch if required).

.5 Specified requirements.

.6 Test results.

.7 Remarks regarding conformance with Contract Documents.

.5 Provide written test results to the Departmental Representative within 12 hours of tests. If the tests are completed on Site, provide the Departmental Representative with field memo summarizing results immediately following testing.

.6 Minimum testing requirements shall be in accordance with all applicable bylaws, regulations, standards, building codes and requirements of authorities having jurisdiction.

1.5 QUALITY CONTROL PLAN

.1 Include the following in the quality control plan:

.1 An organization chart for the project group including identification of the quality control group and the quality control manager.

.2 Resumes of the quality control manager and key quality control personnel.

.3 A statement from the Contractor's management that the quality control manager has authority to reject or require correction of work.

.4 A process for initiating, tracking and resolving rejected work.

.5 A procedure for the quality control of Subcontractors complying with the requirements of the Contract.

.6 An outline of the required communication with the Departmental Representative including:

.1 reporting procedures, both daily and summary reports;

.2 arrangements for pre-work reviews to be organized by the Contractor;

.3 arrangements for weekly quality control review meetings; and

.4 coordination of quality control activities with quality assurance.

.7 A list of test procedures, identification of protocols for sampling and designation of the frequency for each test.

.8 Procedures for pre-qualification of materials.

.9 Provide copies of proposed inspection and testing reporting forms.

.10 Identification of certifications held by the Contractor and relevant to the Work.

.11 A definition of Contractor's management procedure for auditing the quality control plan.

1.6 INSPECTION

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

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

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

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

1.7 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies shall be engaged by the Contractor for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Contractor. Said inspections, testing and quality assurance shall include, but not be limited to the following:

- .1 Concrete mix design and testing.
- .2 Structural and steel inspection.
- .3 Electrical systems inspection and testing.
- .4 Inspection and testing of all materials, components and systems as called for specifically in each specification section and as required.

.2 Submit for approval by Departmental Representative names of proposed Independent Inspection/Testing Agencies

.3 Provide equipment required for executing inspection and testing by appointed agencies.

.4 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.5 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re-inspection.

1.8 ACCESS TO WORK

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

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

1.9 PROCEDURES

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

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

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

1.10 REJECTED WORK

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

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

.3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Departmental Representative.

1.11 REPORTS

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

.2 Provide copies to Subcontractor of work being inspected or tested manufacturer or fabricator of material being inspected or tested.

1.12 TESTS AND MIX DESIGNS

.1 Contractor shall furnish test results and mix designs as may be requested.

.2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Departmental Representative and may be authorized as recoverable.

1.13 SAMPLE INSTALLATIONS / MOCK-UPS

.1 Prepare sample installations and/or mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.

.2 Construct in all locations acceptable to the Departmental Representative.

.3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 If requested, Departmental Representative will assist in preparing a schedule fixing dates for preparation.

.6 Remove mock-up at conclusion of Work or when acceptable to Departmental Representative.

.7 Except where otherwise specified, mock-ups may remain as part of Work.

.8 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

.9 Mockups shall be constructed of actual materials to be used in the work unless otherwise approved by the Departmental Representative.

1.14 MILL TESTS

.1 Submit mill test certificates as required of specification Sections.

1.15 EQUIPMENT AND SYSTEMS

.1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

END OF SECTION

1. GENERAL

1.1 TEMPORARY FACILITIES PLAN

.1 In concert with, and approval of the Departmental Representative and Parks Canada, the Contractor shall prepare a Temporary Facilities Plan (sufficient for the timely performance of the Work) indicating locations and extents of the following:

- .1 Project area, indicating extents of the Work during the Contract;
- .2 Temporary continuous emergency vehicle access routing.
- .3 Contractor's access, lay-down and marshalling areas;
- .4 Job trailers, toilets, first aid station, debris bins, storage sheds and site offices;
- .5 Contractor's parking;
- .6 Temporary hoarding and barriers;
- .7 Project construction & safety signage;
- .8 Special provisions for the protection of Heritage Value.

.2 No work on site shall proceed until the Temporary Facilities & Phasing Plan is approved by the Departmental Representative and Parks Canada.

1.2 TEMPORARY PROTECTION OF HERITAGE ELEMENTS

.1 The Contractor shall provide a Heritage Protection Plan, for approval by the Departmental Representative before starting the work, detailing provisions for the protection of Heritage Character-Defining Elements (ref. Appendix D and part 1.2.2 below.) The historic place's Character-Defining Elements include:

- .1 its formal, classically inspired design and detailing, including the recessed central entrance block flanked by projecting bays with monumental pediments
- .2 its hipped roof, capped by a large square cupola which reinforces the building's symmetry;
- .3 the north addition, which, while it creates an imbalance in the façade, is compatible and discrete;
- .4 the secondary elements and details, such as the columns with ionic capitals, mouldings, paired windows, and turned balustrades; which contribute to the overall formality and strength of the design;
- .5 the remaining original interior features, as noted below.

.2 Heritage Protection Plan

The Contractor shall develop a Heritage Protection Plan that considers the heritage character statement and character defining elements of the Courthouse, and guidance within the Contract documents, and which includes considerations, processes, and procedures for completing the work in accordance with Conservation Guidelines, including, but not limited to discussion of the following:

1. Demonstrating understanding of the original construction methodology of the existing building elements, including the properties and characteristics of the existing roof, which contributes to the heritage value of the historic building (form, proportion, massing),
2. Methods and materials for the protection and stabilization of existing elements and components designated to remain from damage by activities of the contract, and protection from exposure to weather and environmental conditions,
3. Methods and materials for the selective removal of materials and finishes intended to be retained for re-installation or salvage by others,
4. Procedures to minimize required removals and to limit risk of damage to existing elements designated to remain,
5. Methods and materials for evaluating existing conditions of elements and components identified to remain, and determine the appropriate intervention required to protect, and if necessary, stabilize and repair,
6. Utilizing non-destructive or minimally invasive investigation techniques,
7. Performing repairs utilizing recognized heritage conservation methods,
8. Procedures for communicating to the Departmental Representative any requirements to replace in-kind any extensively deteriorated or damaged elements that were designated to remain or for re-installation. New elements shall match the forms, materials, and detailing of sound versions of the original element and shall be compatible with the existing,
9. Procedures for identifying and recording existing conditions before undertaking an intervention, and in order to replace existing materials designated to remain in their original location and orientation.

.3 Protect the following elements from damage during the course of construction:

.1 Interior elements:

.1 South Courtroom- remaining wood ceiling finishes;

.2 Main Staircase- newels, balustrades rails, trims, treads and risers;

.3 Remaining wood windows, including intact glazing.

.2 Exterior elements:

.1 Remaining wood windows & doors, casings and trims;

.2 Wood columns, mouldings, balustrades, rails;

.3 Remaining wood cladding and trims;

.4 Decorative scrollwork and lettering on West facade pediments;

.5 Gutters and downspouts.

.2 Protection Measures

Determination of protection measures are the Contractor’s responsibility, subject to review and approval of the Heritage Protection Plan by the Departmental Representative.

.1 Removal of Protection to Undertake Work

The Contractor may be required to coordinate work with the removal or delayed installation of heritage material protection. In such cases, protection shall only be temporarily removed or its installation delayed in a manner which minimizes the

potential for harm to heritage components both immediately adjacent to the area of work and along any paths of construction operations. As such, it is recommended that all heritage protection be designed to allow for removal, to provide easier reinstallation and to minimize construction related waste generated during the project. It is further recommended that heritage protection be only removed within the immediate area required to carry out work.

.2 In Situ/ In-Place Protection
Ensure appropriate measures are put in place to protect Heritage Elements during the course of the project, as identified in the Contract Documents, including:

a. Unless specifically noted, no Heritage Material protection is to be anchored to or through any Heritage Material or component.

b. In the event that dust, dirt, and liquid barriers require attachment to Heritage Material, only non-permanent removable, non-residue adhesive tapes may be used on the Heritage Material.

c. All in situ Heritage Material protection is to be carefully and completely removed at the conclusion of the project in a manner that does not in any way damage the heritage components.

.3 Protection Accessories

.1 Use only low impact and low vibration fasteners, including:

.1 Bolts with nuts and washers.

.2 Wood screws

.3 Liquid adhesives.

.4 Removable, non-residue adhesive strips and tapes.

.4 Protective Barriers

.1 Provide adequate Protective Barriers and coverings as indicated by the Contract Documents to protect Heritage Elements from impact, abrasion, dust, dirt and liquids;

.2 Interface with Heritage Materials: to protect Heritage Elements from impact or abrasion, direct contact between rigid barrier materials and heritage fabric is prohibited. If direct contact is unavoidable, use a layer of soft padding material between the rigid protective material and the Heritage Material

.4 Vibration and Displacements

.1 Protect sensitive Heritage Elements from vibrations and sudden movements during demolition Work by combining bracing, rigid panelling and full-surface padding as required. Use demolition tools/processes that do not result tin the transfer of vibrations to sensitive materials such as, but not limited to, heritage glazing.

1.3 PREVENTION OF WATER DAMAGE

.1 Maintain complete rain- and snow-shedding capability at all times to ensure that precipitation does not enter the building;

.2 Damage to the Courthouse building as a result of a failure to comply with these requirements shall be repaired at the Contractor's expense, to the satisfaction of the Departmental Representative.

1.4 ACCESS AND DELIVERY

.1 Refer to Section 01 14 00 – Work Restrictions.

.2 Refer to the Site Plan.

.3 Make good damage to local roadways and paved areas used for construction access to work site

1.5 STORAGE AND LAY-DOWN AREA

.1 Confine activities to the immediate area of the site. Do not endanger or interfere with operations, existing facilities nor utilities on site. Refer also to Section 01 14 00.

.2 Contractors' storage and lay-down facilities shall be confined to that area indicated on the Site Plan, and confined by the following Contractor provided means:

.1 Separate lay-down area from vehicular traffic by means of a combination of temporary concrete roadway barriers and temporary construction type fencing secured to the pavement with screws or bolts.

.2 Non-traffic-exposed sides of the areas shall be contained by temporary construction type fencing screwed or bolted to the pavement.

.3 Provide access gates, of type as approved by Departmental Representative, where indicated on Temporary Facilities Plan.

.4 At completion of project, remove concrete barriers, fencing, gates and make good to pavement and other affected elements.

.3 Storage space is limited to lay-down area. Should more storage be required, Contractor shall provide off site.

.4 Do not load or permit to load any part of Work with weight or force that will endanger Work or existing structure or elements.

.5 Contractor(s) shall provide construction trailers for use as site office and storage located in lay-down area.

.6 Locate and maintain in clean, orderly and safe condition. Remove and make good site at Project completion. Provide first aid facilities in strict accordance with WCB requirements. Locate temporary facilities in compliance with Temporary Facilities Plan and as directed by Departmental Representative.

1.6 TEMPORARY CONSTRUCTION POWER

.1 The Contractor may connect a temporary sub-panel to the existing service panel in the Basement. Trailers and other temporary shelters may be connected to the service panel in the Carriage Shed, subject to available load limitations and Parks Canada approval.

.2 Do not use connected electrical power for heating.

1.7 WATER SUPPLY

.1 No municipal water supply is available on site. The contractor is make own arrangements for supply and disposal of construction water.

1.8 SANITARY FACILITIES

.1 Contractor shall provide temporary port able toilets for construction workers on site. Locate in lay-down area and maintain in a sanitary, safe and secure manner. Remove from site and make good at completion of Project.

1.9 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Maintain working temperatures and ventilation rates as required in writing by the manufacturers of the various materials, coatings and systems being employed on the Project.

.3 Construction heaters used inside any buildings must be vented to outside or be flameless type. Solid fuel salamanders are not permitted.

.4 Provide temporary heat and ventilation for construction as required to:

.1 Facilitate progress of Work.
.2 Protect Work and products against dampness and cold.
.3 Concrete curing.
.4 Prevent moisture condensation on surfaces.
.5 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
.6 Provide adequate ventilation to meet health regulations for safe working environment.
.7 No electric power to be used for heating.

1.10 CONTRACTOR'S PARKING

.1 Contractors’ and construction staff parking shall be limited to those areas indicated on the Site Plan.

.2 Coordinate with RCMP for access and parking.

1.11 DEWATERING

.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.12 TEMPORARY COMMUNICATIONS FACILITIES

.1 Provide and pay for temporary telephone and fax hook up, line[s] necessary for own use.

1.13 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

1.14 SCAFFOLDING

.1 Construct and maintain scaffolding in rigid, secure and safe manner in accordance with WCB regulations.

.2 Erect scaffolding independent of walls. Remove promptly when no longer required.

1.15 HOISTING

.1 Provide, operate and maintain hoists required for moving of workers, materials and equipment. Make financial arrangements with Sub-contractors for their use of hoists.

.2 Hoists shall be operated by qualified operator.

1.16 PROTECTION, TEMPORARY BARRIERS AND ENCLOSURES

.1 Enclosure of Work Area(s):

.1 Provide temporary fenced secure protection for sequential work areas until that portion of the work is accepted as complete. Design enclosures to withstand wind pressure. Secure all contractor & construction areas with encloses to secure materials and work.

.2 Provide temporary dust screens where dust generating work occurs.

.2 Guardrails and Excavations:

.1 Provide secure, rigid guard rails and barricades around deep excavations, open edges of floors and roofs in accordance with WCB requirements.

.3 Access to Site:

.1 Maintain existing access roads and designated parking area in broom clean condition. Refer also to Section 01 14 00.

.4 Protection of Building Finishes:

.1 Provide protection for completed and partially completed building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Departmental Representative locations and installation schedule three (3) days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

.5 Mold Control and Materials Protection

.1 Protect all building materials from mold growth and propagation during transit, storage and assembly in accordance with CCA82-2004 – Mold Guidelines for the Canadian Construction Industry.

1.17 SITE SIGNS AND NOTICES

.1 Only Project identification signboards and notices for safety or instructions are permitted on site.

.2 Format, location and quantity of site signs and notices shall be approved by Departmental Representative.

.3 Signs and notices for safety or instructions shall be in English language, or commonly understood graphic symbols.

.4 Maintain signboards, signs and notices for duration of project. Remove and dispose of signs off site on completion of project.

.5 No other signs will be permitted on site unless approved by the Departmental Representative.

1.18 CONTRACTOR'S SITE OFFICE

.1 Provide office (trailer) of size to accommodate site meetings and Contractor’s operations

.2 Provide a clearly marked and fully stocked first-aid facility in a readily available location. Adhere to WCB directions for first aid facilities.

.3 Locate trailer in lay-down area where indicated on Site Plan and as directed by Departmental Representative.

1.19 EQUIPMENT, TOOLS, AND STORAGE

.1 All construction personnel must remain accountable for their tools and equipment at all times. At no time should tools and equipment be left unattended when within reach of the travelling public.

.2 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.3 Locate materials not required to be stored in weatherproof sheds on site in a safe and secure manner to cause least interference with work activities and facility operations and security.

1.20 REMOVAL OF TEMPORARY FACILITIES

.1 Remove temporary facilities from site when directed by the Departmental Representative.

1.21 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily. (Refer to Section 01 74 00 and 01 74 21).

.2 Clean dirt and mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable. (Refer to Section 01 74 21)

.4 At completion of Project: Remove and dispose of all debris, thoroughly clean and restore site to condition found at commencement of Work. Repair and make good to all damage caused by construction activities.

END OF SECTION

PART 1 GENERAL

1.1 Related Sections

.1 Section 01 45 00 - Quality Control

1.2 Reference Standards

.1 All design and construction work shall be executed in conformance with the latest editions of the following Codes, Laws, regulations and trade/manufacturing quality standards associations:

.1 National Building Code of Canada (NBCC).

.2 Model National Energy Code of Canada for Buildings.

.3 National Fire Code, Latest Edition.

.4 NFPA – National Fire Protection Association.

.5 Canada Labour Code – Part 2.

.6 Local Bylaws/Authorities having Jurisdiction.

.7 WorkSafe BC – Workers Compensation Board of BC/YT.

.8 CSA – Canadian Standards Association.

.9 CGSB – Canadian General Standards Board.

.10 ULC – Underwriters Laboratories of Canada.

.11 ASTM – American Society for Testing Materials.

.12 ANSI – American National Standards Institute.

.13 AASHTO – American Association of State Highways & Transportation Officials.

.14 ASHRAE – American Society of Heating, Refrigeration and Air Conditioning Engineers.

.15 AWMAC – Architectural Woodwork Manufacturers Association of Canada.

.16 CSDFMA – Canadian Steel Door and Frame Manufacturer's Association.

.17 CRCA – Canadian Roofing Contractors Association.

.18 RCABC – Roofing Contractors Association of BC.

.19 AWCCBC – Association of Wall and Ceiling Contractors of BC.

.20 CISC – Canadian Institute of Steel Construction.

.21 CSSBI – Canadian Sheet Steel Building Institute.

.22 CUFCA – Canadian Urethane Foam Contractor's Association.

.23 MPI – the Master Painters Institute.

.24 NAAMM – National Association of Architectural Metal Manufacturers.

.25 SMACNA – Sheetmetal and Air Conditioning Contractor's National Association, Inc.

.26 NHLA – National Hardwood Lumber Association.

.27 NLGA – National Lumber Grades Authority.

.28 NFCA – National Floor Covering Association

1.3 Products/Material and Equipment

.1 Use NEW products/material and equipment unless otherwise specified. The term "products" is referred to throughout the specifications.

.2 Use products of one manufacturer for material and equipment of the same type or classification unless otherwise specified.

.3 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.4 Notify Departmental Representative in writing of any conflict between these specifications and manufacturer's instructions. Departmental Representative will designate which document is to be followed.

.5 Provide metal fastenings and accessories in the same texture, colour and finish as base metal in which they occur.

.1 Prevent electrolytic action between dissimilar metals.

.2 Use non-corrosive fasteners, anchors and spacers for securing exterior work.

.6 Fastenings which cause spalling or cracking are not acceptable.

.7 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.8 Use heavy hexagon heads, semi-finished unless otherwise specified.

.9 Bolts may not project more than 1 diameter beyond nuts.

.10 Types of washers as follows:

.1 Plain type washers: use on equipment and sheet metal.

.2 Soft gasket lock type washers: use where vibrations occur.

.3 Resilient washers: use with stainless steel.

.11 Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.

.12 Prevent damage, moisture absorption, contact with organic matter, adulteration and soiling of products during delivery, handling and storage. Immediately remove rejected products from site.

.13 Store products in accordance with suppliers' instructions.

.14 Touch up damaged factory finished surfaces to Departmental Representative's satisfaction.

.1 Use primer or enamel to match original.

.2 Do not paint over nameplates.

1.4 Quality of Products

.1 Products, materials and equipment (referred to as products) incorporated into work shall be new, not damaged or defective, and of the best quality (compatible with the specifications) for the purpose intended. If requested, furnish evidence as to type, source and quality of the products provided.

.2 Defective products will be rejected regardless of previous inspections.

.1 Inspection does not relieve responsibility, but is precaution against oversight or error.

.2 Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Retain purchase orders, invoices and other documents to prove that all products utilized in this Contract meet the requirements of the specifications. Produce documents when requested by the Departmental Representative.

.4 Should any dispute arise as to quality or fitness of products, the decision rests strictly with the Departmental Representative based upon the requirements of the Contract documents.

.5 Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any particular or like item throughout the building.

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.5 Availability of Products

.1 Immediately upon project commencement, review product delivery requirements and anticipate foreseeable supply delays for any items.

.2 If delays in supply of products are foreseeable, notify Departmental Representative of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of the work.

.3 In event of failure to notify Departmental Representative at the start of work and should it subsequently appear that the work may be delayed for such reason, the Departmental Representative reserves the right to substitute more readily available products of similar character, at no increase in either the Contract price or the Contract time.

1.6 Manufacturer’s Instructions

.1 Unless otherwise indicated in the specifications, install or erect products in accordance with the manufacturer's instructions.

.1 Do not rely on labels or enclosures provided with products.

.2 Obtain written instructions directly from the manufacturer.

.2 Notify Departmental Representative in writing of conflicts between the specifications and the manufacturer's instructions so that the Departmental Representative may establish the course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes the Departmental Representative to require removal and re-installation at no increase in either the Contract price or the Contract time.

1.7 Contractor's Options for Selection of Products for Tendering

.1 Products are specified by "Prescriptive" specifications: select any product meeting or exceeding specifications.

.2 Products specified under "Acceptable Products": select any one of the indicated manufacturers, or any other manufacturer meeting or exceeding the Prescriptive specifications and indicated Products.

.3 Products specified by performance and referenced standard: select any product meeting or exceeding the referenced standard.

.4 Products specified to meet particular design requirements or to match existing materials: use only material specified Approved Product. Alternative products may be considered provided full technical data is received in writing by Departmental Representative in accordance with "Special Instructions to Tenderers".

.5 When products are specified by a referenced standard or by or Performance specifications, upon request of Departmental Representative obtain from manufacturer an independent laboratory report showing that the product meets or exceeds the specified requirements.

1.8 Substitution After Contract Award

.1 No substitutions are permitted without prior written approval of the Departmental Representative.

.2 Proposals for substitution may only be submitted after Contract award. Such request must include statements of respective costs of items originally specified and the proposed substitution.

.3 Proposals will be considered by the Departmental Representative if:

.1 products selected by tenderer from those specified are not available;

.2 delivery date of products selected from those specified would unduly delay completion of Contract, or

.3 alternative product to that specified, which is brought to the attention of and considered by Departmental Representative as equivalent to the product specified, and will result in a credit to the Contract amount.

.4 Should the proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on the project. Pay for design or drawing changes required as result of substitution.

.5 Amounts of all credits arising from approval of the substitutions will be determined by the Departmental Representative, and the Contract price will be reduced accordingly.

END OF SECTION

Part 1 General

1.1 RELATED SECTION

.1 Section 01 74 21 — Waste Management and Disposal

.2 Section 01 78 30 — Closeout Submittals

1.2 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris

.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.3 Clear snow and ice from access to building, bank/pile snow in designated areas only.

.4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.5 Provide on-site containers for collection of waste materials and debris.

.6 Provide and use clearly marked separate bins for recycling. Refer to Section 01 74 21 - Waste Management and Disposal.

.7 Remove waste material and debris from site and deposit in waste container at end of each working day.

.8 Dispose of waste materials and debris off site.

.9 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.

.10 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.11 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose. Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer. Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.3 DEMOLISHED MATERIALS AND CONSTRUCTION WASTE

.1 The Contractor is responsible for ensuring that all materials are properly disposed of and that under no circumstances are demolished materials, construction waste, screws,

fasteners, connectors and other similar items to be left in walls, ceilings, cavities, pockets, and voids.

1.4 FINAL CLEANING

.1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review, remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris including that caused by other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.

.6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.

.9 Clean lighting reflectors, lenses, and other lighting surfaces.

.10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.11 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

.12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.14 Remove dirt and other disfiguration from exterior surfaces.

.15 Clean and sweep roofs, gutters, areaways, and sunken wells.

.16 Sweep and wash clean paved areas.

.17 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.

.18 Clean roofs, downspouts, and drainage systems.

.19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.20 Remove snow and ice from access to building.

END OF SECTION

PART 1 GENERAL

1.1 General

.1 The work in this Section includes but is not limited to:

.1 Management and disposal of construction and demolition waste.

1.2 Quality Assurance

.1 Waste Management at Project Meetings:

.1 Waste Management Coordinator shall provide an update on the status of waste diversion and management activities at each Construction Coordination meeting. A written monthly summary report of this status shall also be provided by the WMC.

1.3 Waste Management Goals

.1 Provide a Waste Reduction Workplan, in coordination with the municipality, for approval by the Departmental Representative. Obtain required municipal disposal permits.

.2 No salvaging of materials from site. All materials are to be sent to the land fill site, from where they can be salvaged.

.3 Work only in precepts of waste reduction work plan.

1.4 Related Sections

.1 Section 02 41 00 – Demolition

1.5 Definitions

.1 Approved/Authorized recycling facility: Waste recycler approved by application provincial authority or other users of material for recycling approved by the Departmental Representative.

.2 Construction, Renovation and/or Demolition (CRD) Waste: Solid, non-hazardous waste material generated during construction, demolition, and/or renovation projects.

.3 Recyclable: Ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse by others.

.4 Recycle: Process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.5 Recycling: Process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using in altered form. Does not include burning, incinerating, or thermally destroying.

.6 Reuse: Repeated use of product in same form but not necessarily for same purpose. Reuse includes:

.1 Salvaging reusable materials from re-modeling projects, before demolition stage, for resale, reuse on current project, or storage for use on future projects.

.2 Returning reusable items including pallets or unused products to vendors.

.7 Salvage: Removal of structural and non-structural materials from

deconstruction/disassembly projects for purpose of reuse or recycling.

.8 Source Separation: Acts of keeping different types of waste materials separate from the point at which they are deconstructed, disassembled or demolished.

.9 Waste Audit: Detailed inventory of the estimated quantities of waste materials into categories of reuse, recycling or landfill. Requires quantifying by weight the estimated amounts of material and waste to be generated during construction, demolition, deconstruction, or renovation.

.10 Waste Diversion Report: Detailed report of final results, quantifying cumulative weights and percentages of waste materials reused, recycled and land-filled over the course of the Project. Measures success against WRW goals and identifies lessons learned.

.11 Waste Management Coordinator: Contractor representative responsible for supervising on-site waste management activities as well as coordinating required submittals and reports.

.12 Waste Reduction Workplan: Report which outlines the strategy to optimize opportunities for reduction, reuse, and recycling of waste materials generated by the Project. Specifies diversion goals, implementation and reporting procedures, anticipated results and responsibilities.

.13 Waste Source Separation Program: The implementation and coordination of ongoing activities to ensure designated waste materials will be sorted in pre-defined categories sent for recycling and reuse, maximizing diversion and the potential to reduce disposal costs.

1.6 Documents

.1 Maintain and post in a visible, accessible area at job site, one copy of following documents:

- .1 Waste Reduction Workplan.
- .2 Waste Source Separation Program.

1.7 Submittals

.1 Submittals in accordance with Section 01 33 00.

.2 Prepare and submit following prior to Project start-up:

- .1 Waste Reduction Workplan.
- .2 Waste Source Separation Program.

.3 Prepare and submit the following weekly throughout the Project or at intervals agreed to by the Department Representative:

- .1 Receipts, scale tickets, waybills, and/or waste disposal receipts that show quantities and types of materials reused, recycled, or disposed of.
- .2 Waste Material Tracking Form, regularly updated.
- .3 A written **monthly** summary report detailing the cumulative amounts of waste materials reused, recycled and landfilled, and a brief status of the ongoing waste management activities. Refer to attached Diversion Report form to track waste amounts.

.4 Submit the following documentation prior to final payment:

- .1 The Final Waste Diversion Report – indicating the final quantities by material

types (in tonnes) salvaged for reuse, recycling or disposal in landfill and the recycling centres, re-use depots, landfills and other waste processors that received these waste materials.

.2 Provide all remaining receipts, scale tickets, waybills, waste disposal receipts that confirm the quantities and types of materials reused, recycled, or disposed of and their destination.

1.8 Waste Reduction Workplan

.1 Prior to the Project start-up and not less than 10 days before the kick-off meeting, prepare and submit a written Waste Reduction Workplan report, for review and acceptance by the Departmental Representative before the start of work.

.2 Structure Waste Reduction Workplan to prioritize actions and follow 3Rs hierarchy:

1. Reduction, 2. Reuse, 3. Recycle.

.3 The Waste Reduction Workplan report should include but is not limited to:

.1 Realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome thse barriers.

.2 Destination of materials listed.

.3 Deconstruction/disassembly techniques and sequencing.

.4 Recycler or reclaimer requirements.

.5 Schedule for deconstruction/disassembly.

.6 Location.

.7 Security.

.8 Protection.

.9 Materials handling and removal procedures.

.10 Clear labeling of storage areas.

.11 Details on materials handling and removal procedures.

.12 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill. Detailed and Summary Waste Reduction Workplan forms are attached to this section.

.4 Post Waste Reduction Workplan or summary where workers at site are able to review content.

.5 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.

1.9 Material Source Preparation

.1 As a part of the Waste Reduction Workplan, prepare and submit for review a Waste Source Separation Program prior to project start-up.

.2 The Waste Source Separation Program shall detail the Contractor’s methodology and planned on-site activities for separation of reusable and recyclable waste material from the other waste intended for landfill.

.3 Provide all on-site facilities and containers for separation and storage of materials.

.4 Provide training for employees/trades in the handling and separation of materials for reuse and/or recycling.

.5 Clearly and securely label all containers to identify types/conditions of materials accepted and assist employees/trades in separating materials accordingly.

.6 On-site sale of salvaged materials is not permitted unless authorized in writing by the Departmental Representative and provided that all site safety regulations and security requirements are adhered to.

1.10 Use of Site and Facilities

.1 Execute waste management work with least possible interference or disturbance to normal use of premises.

.

1.11 Scheduling

.1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of waste management activities.

1.12 Waste Diversion Resources

.1 The Contractor is responsible for researching and locating waste diversion resources and service providers.

PART 2 PRODUCTS

2.1 Not used.

PART 3 EXECUTION

3.1 Processing of Waste Materials

.1 Implement the Waste Reduction Workplan and Waste Source Separation Program generated for the project in compliance with approved methods and as reviewed by the Departmental Representative.

.2 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.

.3 Locate containers in designed locations or areas approved by the Departmental Representative.

.4 Keep separation areas clean and neatly organized. Separation activities shall not interfere with the daily operations of the building or areas of use.

.5 Collect, handle, and store separated materials using methods which minimize material damage.

.6 Store materials to be reused or recycled on-site in locations indicated or as directed by Departmental Representative.

.7 Transport Salvaged materials off-site to approved and/or authorized recycling facility or to users of material for recycling.

.8 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.9 Protect, stockpile, store and catalogue salvaged items.

3.2 Weighing Materials

.1 Unless otherwise agreed to by the Departmental Representative, all materials are to be weighed, whether designated for reuse, recycling, other diversion, or landfill.

.2 Where agreed by the Departmental Representative, weights of material not weighed directly, will be obtained using measure values and unit weights.

3.3 Scheduling

.1 Coordinate work with other activities at the site to ensure the timely and orderly progress of the work.

3.4 Protection

.1 Protect salvaged materials intended for reuse on the site from damage. Catalogue and/or inventory all materials salvaged intended only for reuse on-site.

.2 Protect structural components not for removal or demolition from movement or damage.

.3 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.

.4 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.

.5 Avoid co-mingling of materials intended for reuse or recycling. If required, remove co-mingled materials to off-site processing facility for separation.

3.5 Disposal of Wastes

.1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

.2 Do not bury rubbish or waste materials, and do not dispose of waste into waterways, storm, or sanitary sewers.

3.6 Documentation and Records

.1 Keep accurate records of all construction waste generated and sent off-site during the Project using the sample Waste Material Tracking Form attached fo this section. The information tracked should include:

.1 Number and size bins.

.2 Waste type (s) of each bin.

.3 Total tonnage generated of specific material.

.4 Tonnage reused or recycled of specific material.

.5 Reused or recycled waste destination.

.2 Obtain receipts, scale tickets, and/or waybills for all waste materials removed from site. Where the receiver cannot provide the noted proof of delivery, provide copy of Waste Material Tracking Form signed by the receiver.

.3 Prepare monthly Summary Waste Diversion Reports summarizing waste removal activities and quantities from site.

.4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

.5 At the completion of the project, prepare a written Final Waste Diversion Report and summary indicating all final quantities of materials reused, recycled or disposed of as well as the following:

.1 Identify final diversion results and measure success against goals from the WRW.

.2 Compare final quantities/percentages diverted with initial projections in Waste Reduction Workplan, explaining variances.

.3 Supporting documentation (eg waybills and tracking forms).

.4 Description of issues, resolutions and lessons learned.

END OF SECTION

PART 1 GENERAL

1.1 Submission

.1 Prepare instructions and data by personnel experienced in maintenance and operation of described products.

.2 Revise content of documents as required before final submittal.

.3 Phasing of submission:

.1 2 weeks before substantial performance of the work, submit to Departmental Representative 4 final copies of operation and maintenance manuals.

.4 Ensure spare parts, maintenance materials and special tools provided are new, neither damaged nor defective, and of same quality and manufacture as products provided in work.

.5 If requested, furnish evidence as to type, source and quality of products provided.

.6 Defective products will be rejected, regardless of previous inspections. Replace products at own expense

1.2 Format

.1 All as-built drawings and operation and maintenance (O&M) manuals listed under the Scope of Work shall be converted, where necessary, into Portable Data File (PDF) format permit for viewing using the Acrobat Reader software free from the internet.

.2 Documentation storage and retrieval system shall be structured based on a database framework with direct links to the appropriate PDF files. Documents retrieval and viewing shall be executed through a menu driven approach.

.3 The Program shall provide multi-level of password entry for access to add new or edit stored data by authorized users.

.4 Program shall be capable of storing separately and independently data of multiple buildings and shall be expandable for addition of new buildings and systems.

.5 Data of each building shall be accessible by the input of either the building name or building number as defined by the program user.

1.3 Contents, Each Volume

.1 Table of Contents – provide the following:

.1 Title of project.

Date of submission.

.2 Names, addresses, and telephone numbers of Departmental Representative and Contractor with name of responsible parties.

.3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system, list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Building data shall be collected and stored in a database format as an integral part of the Program. Building data shall include the following:

.1 Building Name

.2 Building Address

.3 Facility Manager

.4 Building Photos

1.4 Operation and Maintenance Manual

.1 Record drawings:

.1 As work progresses, maintain accurate records to show all deviations from the Contract Drawings. Note on as-built drawings as changes occur. At completion supply:

.1 Two (2) set of CD's in AutoCad file format (version 2018) with all as-built information on the diskettes.

.2 Four (4) sets of printed as-built drawings.

.3 Submit one copy of check plots to Departmental Representative prior to final printing of as-built drawings.

.4 Retain original logo and title block area a small company logo, the text "AS-BUILT" and the date.

.2 Final Drawings:

.1 Drawings shall be converted from the original electronic files, such as CAD, into PDF format. If only the hard copies of the 'as-built' drawings are available, they shall be scanned and saved in PDF format. PDF files of the 'As-built' drawings shall be enhanced with the following bookmarks to zoom into legible views on the computer screen as a minimum:

.1 Drawing Number and Title

.2 Drawing Notes

.3 Major Equipment Locations

.4 Cross-links to other related drawings

.5 Revisions

.3 Cost for transferring as-built information from marked up working set of drawings to electronic format using ACAD and plotting services shall be included in the Contract.

.2 Maintenance Manual:

.1 Upon completion of project submit to Departmental Representative three (3) CD R/disk copies and one paper (in 3" D ring, loose leaf binder with spine and face pockets, to match Facility's existing) of Operations and Maintenance Manual, made up as follows:

.1 All as-built drawings and operation and maintenance (O&M) manuals listed under the Scope of Work shall be converted, where necessary, into Portable Data File (PDF) format for viewing using the Adobe Acrobat Reader.

.2 Documentation storage and retrieval system shall be structured based on a database framework with direct links to the appropriate PDF files. Documents retrieval and viewing shall be executed through a menu driven approach.

.3 Organize files into CSI Masterformat numbering system or other approved descriptive titles. O&M data and as-built drawings shall be classified by their corresponding disciplines, including:

.1 Architectural

.2 Structural

.3 Mechanical

.4 Electrical

.5 Data & Communication

.6 Civil

.4 Program shall be capable of storing separately and independently data of multiple buildings and shall be expandable for addition of new buildings and systems.

.5 The manual shall, according to the type of services or disciplines, include the full contents of each hard copy of the O&M Manuals with the addition of Miscellaneous Maintenance Reports and Records, or as defined by the user. In general the following shall be included unless specifically excluded by the user:

.1 Introduction

.2 Departmental Representative/Contractor/Suppliers List

.3 System Description

.4 Maintenance and Lubrication Schedules

.5 Testing and Commissioning (T&C) Reports

.6 Misc. Reports

.7 Specifications

.8 Equipment and/or point schedules as identified in the hard copy documents.

.9 Others as stipulated by the user

All Basic Documents PDF files shall be enhanced with appropriate bookmarks to facilitate searching of information within the document or linked to other relevant documents for references.

.6 Building systems data shall be identified by their services, disciplines, function, nature and specific scope. System data shall be classified into the following categories:

.1 System Description

.2 Schematic (where applicable)

.3 Equipment List

Provide hot key buttons, where applicable, for direct access to drawings/data referenced on schematics. The same shall be applied to listed equipment for direct links to the corresponding equipment data.

.7 Equipment data shall be classified into the following categories:

.1 Equipment submittals

.2 T&C Report

.3 Maintenance Data

.4 Maintenance Records

.5 Photo

Provide a summary screen to list all equipment classified under a specific system. On the summary screen, provide direct links to the corresponding equipment data under each category with addition links to the relevant 'As-Built' drawings.

.8 Program shall be executed by Professional Engineers with a minimum of 10 years post qualification experience in the field of Building Services Engineering.

.9 The Contractor shall provide a minimum of 3 past job references as proven record of similar undertakings commissioned by internationally renowned institutions or government agencies.

.10 The Contractor shall provide a minimum of 3 past job references as proven record of similar undertakings commissioned by internationally renowned institutions or government agencies.

.11 Refer to Mechanical and Electrical Divisions for specific details for Mechanical and Electrical data.

.12 An example of the service provider is "Company: D-Elements Designing Services Inc. Contact Name: Ken Mak. Phone No: (604) 786-8892, Email: Kenneth.kc.mak@gmail.com

.2 Changes made by addenda and change orders.

1.5 Equipment and Systems

.1 Operating procedures – include the following:

.1 Start-up, break-in, and routine normal operating instructions and sequences.

.2 Regulation, control, stopping, shutdown, and emergency instructions.

.3 Summer, winter, and any special operating instructions.

.2 Maintenance requirements: list routine procedures for

.1 Each item of equipment and each system.

.3 Provide servicing and lubrication schedule, and list of lubricants required.

.4 Include manufacturer's printed operation and maintenance instructions.

.5 Include sequence of operation by controls manufacturer.

.6 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.7 Provide installed control diagrams by controls manufacturer.

.8 Provide Contractor's coordination drawings with installed colour coded piping diagrams.

.9 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.10 Provide list of original manufacturer's spare parts, current prices, and recommended

quantities to be maintained in storage.

.11 Additional requirements: as specified in individual specification Sections.

1.6 Manufacturer's Documentation Reports

.1 When specified in individual Sections, require manufacturer to provide authorized representative to demonstrate operation of equipment and system, instruct Departmental Representative's indicated facility's personnel, and provide detailed written report that demonstration and instructions have been completed.

.2 Departmental Representative will provide list of personnel to receive instructions, and will coordinate their attendance at agreed-upon times.

1.7 Spare Parts

.1 Provide spare parts in quantities specified in individual specification Sections.

.2 Provide items of same manufacture and quality as items in work.

.3 Deliver to on-site location as directed; place and store.

.4 Receive and catalogue all items. Submit inventory listing to the Departmental Representative. Include approved listings in maintenance manual.

.5 Obtain receipt for delivered products and submit to Departmental Representative.

1.8 Maintenance Materials

.1 Provide maintenance and extra materials in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in work.

.3 Deliver to on-site location as directed; place and store.

.4 Receive and catalogue all items. Submit inventory listing to the Departmental Representative. Include approved listings in maintenance manual.

.5 Obtain receipt for delivered products and submit to Departmental Representative.

1.9 Special Tools

.1 Provide special tools in quantities specified in individual specification Sections.

.2 Provide items with tags identifying their associated function and equipment.

.3 Deliver to location as directed; place and store.

.4 Receive and catalogue all items.

.1 Submit inventory listing to the Departmental Representative.

.2 Include approved listings in maintenance manual.

1.10 Warranties, Bonds, Test Reports, Inspection Reports

.1 Separate each Document with index tab sheets keyed to Table of Contents listing.

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

.3 Obtain Warranties, Bonds, Test Results, Inspection Reports executed in duplicate by subcontractors, suppliers, manufacturers, and inspection agencies within 10 days after completion of the applicable item of work.

.4 Except for items put into use with the Departmental Representative's permission, leave date of beginning of time of warranty until the 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 Retain warranties and bonds until time specified for submittal.

1.11 Completion

.1 Submit a written certificate that the following have been performed:

.1 Work has been completed and inspected for compliance with the Contract documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, adjusted and balanced, and are fully operational.

.4 Operation of systems has been demonstrated to the personnel indicated by the Departmental Representative.

.5 Work is complete and ready for final inspection.

END OF SECTION

PART 1 GENERAL

1.1 Related Work

.1	Section 01 14 00	Work Restrictions
.2	Section 01 35 33	Health and Safety Requirements
.3	Section 01 35 43	Environmental Procedures
.4	Section 01 51 00	Temporary Facilities
.5	Section 01 74 21	Waste Management and Disposal

1.2 Submittals

.1 All submittals shall be in accordance with Section 01 33 00 – Submittal Procedures.

1.3 Precautions

.1 Archaeological Chance Find Protocol: should any cultural items or materials be uncovered in the course of demolition or excavation work, refer to Section 01 14 00, Part 1.7 for mandatory procedures.

.2 Should material resembling spray or trowel applied asbestos or any other designated substance be encountered in the course of demolition, stop work, take preventative measures and notify the Departmental Representative immediately. Do not proceed until written instructions have been received.

1.4 Protection

.1 Prevent movement, settlement or damage to adjacent structures and paving. Provide bracing and shoring as required. Make good damage and be liable for injury caused by demolition.

.2 Take precautions during demolition to support parts of structures not being demolished, and if safety of existing booth appears to be endangered, cease operations and notify Departmental Representative.

.3 Prevent debris from blocking drainage which must remain in operation.

.4 Take precaution during demolition to protect all adjacent finished surfaces. Refer to Sections 01 14 00 Work Restrictions and 01 51 00 Temporary Facilities.

.5 Fires burning and selling of waste of materials is not permitted on site.

.6 Do not bury waste or materials on site.

.7 Do not dispose of waste or volatile materials such as: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout project.

1.5 Health and Safety

.1 Do construction occupational health and safety in accordance with Section 01 35 33 – Health and Safety Requirements and the Workers' Compensation Board of YT latest regulations.

1.6 Waste Management and Disposal

.1 Separate waste management materials for reuse and recycling in accordance with Section 01 74 21 – Waste Management and Disposal and the Waste Reduction Workplan, and the Waste Management Plan to the maximum extent economically possible.

PART 2 LOCATIONS

2.1 Selective Demolition Scope

.1 Refer to Demolition Plans. Demolition and removal work includes, but is not limited to the demolition and proper disposal of interior and exterior building elements, materials and systems as noted, including designated shoring and temporary supports.

1. Attic ceiling finishes and remaining insulation;
2. Demolition required for structural upgrade work, including removal of temporary metal shoring/bracing installed in Phase 1;
3. Existing standing seam metal roofing, flashing and appurtenances

.2 Dormers: carefully remove whole (in 1 piece each) 2 roof dormers on the East elevation. Protect and brace the dormer assemblies & finishes, detach whole from the roof structure, and lower to the ground for upgrading & finishing per drawing A2.621.

.3 Existing Roof Sheathing: retain existing 25mm wood roof sheathing in place, or (optionally) temporarily remove areas of the roof sheathing to facilitate structural work. Provide a Roof Sheathing Work Plan as part of the Heritage Protection Plan, recording areas of roof sheathing to be temporarily removed, or planks requiring cutting, for approval of the Departmental Representative. Re-install the full extent of existing roof sheathing, including in interior attic spaces. Replace any damaged sheathing planks with matching material to the satisfaction of the Departmental Representative. Refer to part 3.2.4 below.

.4 Roof Rain Gutters: carefully temporarily remove in sections the existing heritage metal roof gutter and horizontal diverter pipe sections. Cut the attaching nails and ferules if needed. Mark & notate the gutter sections in sequential order. Retain & protect metal downpipes in place. Temporarily store & protect the removed gutter sections, and re-install in original order per Section 07 41 00 part 3.4.

PART 3 EXECUTION

3.1 Work

.1 Dispose of demolished materials off site except where noted otherwise. Refer to Section 01 74 21.

.2 Carefully remove all noted material in areas of renovation. Qualified tradesmen shall be used for the removal of all material scheduled for re-use. Contractor shall be responsible for making good, to the satisfaction of the Departmental Representative, all damage to materials and equipment to be reinstalled.

.3 Site-examine and record locations, conditions, etc., of all elements which must be removed then re-installed and made good after re-installation work.

.4 Where existing piping, conduits, wall assemblies, wiring, applied items and other elements are removed, patch and make good affected surfaces which are to remain. Patching and remedial materials shall match adjacent existing unless otherwise noted.

.5 Protect all existing elements and finishes not scheduled for replacement and store where directed as required. Make good where damaged.

.6 Layout and execute all cutting and demolition such as to cause the least amount of disruption to remaining existing finishes, materials, elements and equipment.

.7 Unless otherwise noted, all existing items noted as: "Remove and Dispose of" shall be considered as Contractor's salvage.

3.2 Material Handling During Removal

.1 REMOVE AND DISPOSE:

.1 Item for removal and disposal by the Contractor not identified for retention;

.2 Where there is uncertainly on if an item is to be removed and disposed of, confirm with Departmental Representative.

.2 PROTECT IN SITU (OR IN PLACE):

.1 All items that have not been specifically identified for removal or disposal in the Contract Documents are to remain in situ. Required protection for items as identified in the Contract Documents.

.3 REMOVE AND RETAIN FOR FUTURE REINSTALLATION BY OTHERS:

Items identified reinstallation in existing location are identified in the drawings.

.1 All heritage components are required to be removed by qualified personnel with skill and experience in removing and handling the affected type of material.

.2 Heritage components identified under this category shall be removed by the Contractor as soon as practical, in a manner that minimizes the potential risk to the heritage component and the building as a whole.

.3 No damage should be incurred to the heritage building and its historic finishes and elements when these items are being removed.

.4 Protection, in this case is meant for the affected heritage component to minimize risk of harm during post-removal operations.

.5 Any components that remain in storage at the completion of the project are to be turned over to the Departmental Representative at a local facility identified by the Departmental Representative.

.4 REMOVE AND RETAIN FOR GENERAL REINSTALLATION:

Items identified as "Remove and retain" are identified on the drawings.

.1 All heritage components are required to be removed by qualified personnel with skill and experience in removing and handling the affected type of material.

.2 Heritage components identified under this category shall be removed by the Contractor as soon as practical, in a manner that minimizes the potential risk to the heritage component and the building as a whole.

.3 No damage should be incurred to the heritage building and its historic finishes and elements when these items are being removed.

.4 Protection, in this case, is meant for the affected heritage component to minimize risk of harm during post-removal operations.

.5 Storage for heritage components under this category is to be approved by Departmental Representative.

.6 Any components that remain in storage at the completion of the project are to be turned over to Departmental Representative at a location identified by the Departmental Representative.

.5 General Note re Potential Re-Use/Surplus:

Where a greater quantity of materials has been specified for salvage than are reinstalled in the finished project, Departmental Representative may direct the Contractor at the completion of the project on storage of a limited quantity of these materials for future use in building operations.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Loose Asbestos containing materials (ACMs) have been identified as remaining in the Former Territorial Courthouse in concealed locations including roof soffits and balconies.

.2 This project scope of work includes the opening of concealed spaces, abatement of any discovered ACMs, and replacement in kind of building finish materials that are removed for abatement work, as detailed.

.3 Abatement shall be conducted to handle, alter, remove and/or dispose of ACMs as identified, and in accordance with applicable regulations, guidelines, standards and/or best practices for such work, where such identified ACMs will be impacted (handled, altered, damaged, removed) by the Work. This will involve the following, at a minimum:

.1 Loose trace ACMs in roof and portico soffits;

.2 Loose trace ACMs in attic-level concealed spaces.

.4 Contractor is responsible for reviewing plans, specifications and reports such that they understand the locations and amounts of ACMs that will be impacted by the Work of this contract, and such that appropriate plans and budgets can be included in their overall bids

.5 Unless otherwise determined through risk assessment conducted by the Contractor's competent person (certified in asbestos control procedures, per the requirements of the YT OHS Reg.), at a minimum, the Contractor is to comply with requirements of this Section when performing work that will involve disturbance, alteration, damage, removal and/or disposal of the identified ACMs.

.6 Deviation from the procedures outlined in this specification must be approved by the Departmental Representative prior to implementation.

.1 Deviation that involves less stringent procedures must first be approved in writing by a Yukon Government Occupational Health and Safety Officer.

.2 The Contractor may choose to combine tasks outlined in this specification section with other tasks being completed under more stringent procedures, provided that these procedures in totality will prevail for all "combined" work.

1.2 SECTION INCLUDES

.1 Requirements, applicable procedures and personal protective equipment to be utilized during asbestos abatement activities as outlined herein.

1.3 REFERENCES

.1 Canadian Environmental Protection Act,1999 (CEPA 1999)

.1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).

.2 Department of Justice Canada (Jus)

.1 Transportation of Dangerous Goods Act, 1992 (TDG Act) [1992], (c. 34).

.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).

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

.1 Material Safety Data Sheets (MSDS).

.4 National Research Council Canada Institute for Research in Construction (NRC-IRC).

.1 National Fire Code of Canada-(2010).

.2 National Building Code of Canada (2015)

.5 Yukon Government

.1 Yukon Territory Occupational Health and Safety Act and Regulations (YT OHS Reg.), including amendments to the date of the work

.2 Solid Waste Regulations, including amendments to the date of the work

.3 Special Waste Regulations, including amendments to the date of the work

.4 Contaminated Sites Regulation, including amendments to the date of the work

.6 Government of Canada

.1 The Canada Labour Code, Part II, Canada Occupational Health and Safety Regulations (COHSR)

.2 The Federal Halocarbon Regulation (FHR).

1.4 DEFINITIONS

.1 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.

.2 Asbestos Containing Materials (ACMs): materials that contain any asbestos and are identified under existing conditions including fallen materials and settled dust.

.3 Asbestos Work Area: area where work takes place which will, or may disturb ACMs.

.4 Authorized Visitors: Departmental Representative, and representatives of regulatory agencies.

.5 Competent worker: in relation to specific work, means a worker who:

.1 Is qualified because of knowledge, training and experience to perform the work.

.2 Is familiar with the territorial and federal laws and with the provisions of the regulations that apply to the work.

.3 Has knowledge of all potential or actual danger to health or safety in the work.

.6 Friable Materials: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.

.7 Glove Bag: prefabricated glove bag as follows:

.1 Minimum thickness 0.25 mm (10 mil) polyvinyl-chloride bag.

.2 Integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elastic ports.

.3 Equipped with reversible double pull double throw zipper on top and at approximately mid-section of the bag.

.4 Straps for sealing ends around pipe.

.8 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any dimension at 99.97% efficiency.

.9 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.10 Occupied Area: any area of building or work site that is outside Asbestos Work Area.

.11 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

.12 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for scope of work.

1.5 SUBMITTALS

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

.2 Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of asbestos containing waste in accordance with requirements of authority having jurisdiction.

.3 Submit Territorial and/or local requirements for Notice of Project Form.

.4 Submit proof of Contractor's Asbestos Liability Insurance.

.5 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos containing waste and proof that asbestos containing waste has been received and properly disposed.

.6 Submit proof that all asbestos workers and/or supervisor have received appropriate training from a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing. Instruction and training related to respirators includes, at minimum:

.1 Fitting of equipment.

.2 Inspection and maintenance of equipment.

.3 Disinfecting of equipment.

.4 Limitations of equipment.

.7 Submit proof that supervisory personnel have attended asbestos abatement course, of not less than two days duration.

.8 Submit Worker's Compensation Board status and transcription of insurance.

.9 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:

.1 Encapsulants.

.2 Amended water.

.3 Slow drying sealer.

.10 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested with respirator that is personally issued.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Territorial and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at the time work is performed.

.2 Health and Safety:

.1 Do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

.2 Safety Requirements: worker and visitor protection.

.1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

.1 Full-facepiece powered, air purifying respirator with P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Territorial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

.2 Disposable type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing to consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing. It includes suitable footwear, and it to be repaired or replaced if torn.

.3 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.4 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.

.5 Ensure workers wash hands and face when leaving Asbestos Work Area.

.6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

.7 Visitor Protection:

.1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.

.2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 02 81 01 - Hazardous Materials.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling.

.4 Separate for reuse and recycling and place in designated containers steel, metal, and/or plastic waste.

.5 Place materials defined as hazardous or toxic in designated containers.

.6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.7 Fold up metal banding, flatten and place in designated area for recycling.

.8 Disposal of asbestos waste generated by removal activities must comply with Federal, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 mil bags or leak proof drums. Label containers with appropriate warning labels.

.9 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

1.8 EXISTING CONDITIONS

.1 Reports and information pertaining to ACMs to be removed and disposed, as noted above, are based on partial visual observation only. The exact extent of ACMs remaining in the building is unknown. Assume removal of trace amounts loose ACMs in all soffits and attic concealed spaces.

.2 Notify Departmental Representative of other suspected ACM discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from the Departmental Representative.

1.9 SCHEDULING

.1 Hours of Work: perform work during normal working hours as indicated in Contract Documents.

Part 2 Products

2.1 MATERIALS

.1 Drop and Enclosure Sheets:

.1 Polyethylene: 0.15 mm thick.

.2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.

.2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in concentration to provide thorough wetting of asbestos containing material.

.3 Waste Containers: contain waste in two separate containers.

.1 Inner container: 0.15 mm thick sealable polyethylene bag or where glove bag method is used, glove bag itself.

.2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.

.3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site.

.4 Glove bag:

.1 Acceptable materials: safe-T-Strip products in configuration suitable for Work, or Alternative material approved by addendum during tendering period in accordance with Instructions to Tenderers.

.2 The glove bag to be equipped with:

.1 Sleeves and gloves that are permanently sealed to the body of the bag to allow the worker to access and deal with the insulation and maintain a sealed enclosure throughout the work period.

.2 Valves or openings to allow insertion of a vacuum hose and the nozzle of a water sprayer while maintaining the seal to the pipe, duct or similar structure.

.3 A tool pouch with a drain.

.4 A seamless bottom and a means of sealing off the lower portion of the bag.

.5 A high strength double throw zipper and removable straps, if the bag is to be moved during the removal operation.

.5 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.

.6 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.

.1 Sealer: flame spread and smoke developed rating less than 50.

.7 Encapsulant: penetrating type conforming to CAN/CGSB-1.205.

Part 3 Execution

3.1 PREPARATION

.1 Do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.

.2 Work Areas:

.1 Shut off and isolate air handling and ventilation systems to prevent fibre dispersal to other building areas during work phase. Conduct smoke tests to ensure that duct work is airtight. Seal and caulk joints and seams of active return air ducts within Asbestos Work Area.

.2 Clean proposed work areas using, where practicable, HEPA vacuum cleaning equipment. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum equipment.

.3 The spread of dust from the work area to be prevented by:

.1 Using enclosures of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure material is opaque, one or more transparent window areas to allow observation of the entire

work area from outside the enclosure), if the work area is not enclosed by walls.

.2 Using curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted on each side of each entrance or exit from the work area.

.4 Put negative pressure system in operation and operate continuously from time first polyethylene is installed to seal openings until final completion of work including final cleanup. The system to maintain a negative air pressure, relative to the area outside the enclosed area. The system to be inspected and maintained by a competent person prior each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it to be replaced before the ventilation system is used.

.1 Negative air units are to be dioctyl phthalate (DOP) tested on-site, prior to installation/use, with test results provided to Departmental Representative for review.

.5 Seal off openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.

.6 Cover floor and wall surfaces with polyethylene sheeting sealed with tape. Cover floors first so that polyethylene extends at least 300 mm up walls then cover walls to overlap floor sheeting.

.7 Build airlocks at entrances to and exits from work areas so that work areas are always closed off by one curtained doorway when workers enter or exit.

.8 At each access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used: "CAUTION ASBESTOS HAZARD AREA (25 mm) NO UNAUTHORIZED ENTRY (19 mm) WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)".

.9 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Fire Commissioner of Canada and Territorial Fire Marshall Authority having jurisdiction.

.10 Where application of water is required for wetting asbestos containing materials, shut off electrical power, provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.

.11 After preparation of work areas and Decontamination Enclosure Systems, for the removal of all other asbestos containing materials, remove within work area and dispose of as contaminated waste in specified containers. Spray asbestos debris and immediate work area with amended water to reduce dust, as work progresses.

.3 Construction of Decontamination Enclosures:

.1 Build suitable framing for enclosures or use existing rooms where convenient, and line with polyethylene sheeting sealed with tape.

.2 Build curtained doorways between enclosures so that when people move through or when waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.

.4 Maintenance of Enclosures:

.1 Maintain enclosures in tidy condition.

.2 Ensure that barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.

.3 Visually inspect enclosures at beginning of each working period.

.4 Use smoke methods to test effectiveness of barriers when directed by Departmental Representative.

.5 Do not begin Asbestos Abatement work until:

.1 Arrangements have been made for disposal of waste.

.2 For wet stripping techniques, arrangements have been made for containing, filtering, and disposal of waste water.

.3 Work area[s] and decontamination enclosures are effectively segregated.

.4 Tools, equipment, and materials waste containers are on hand.

.5 Arrangements have been made for building security.

.6 Warning signs are displayed where access to contaminated areas is possible.

.7 Notifications have been completed and other preparatory steps have been taken.

3.2 SUPERVISION

.1 Minimum of one Supervisor for every ten workers is required.

.2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos-containing materials.

3.3 PROCEDURES

.1 Before removing asbestos:

.1 Prepare site.

.2 Spray asbestos material with water containing specified wetting agent, using airless spray equipment capable of providing "mist" application to prevent release of fibres. Saturate asbestos material sufficiently to wet it to substrate without causing excess dripping. Spray asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.

.2 Remove saturated asbestos material in small amounts. Do not allow saturated asbestos to dry out. As it is being removed pack material in sealable plastic bags 0.15 mm minimum thick and place in labelled containers for transport.

.3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination area, and store in a holding area pending removal to

Unloading Room and outside. Ensure that containers are removed from holding area by workers who have entered from uncontaminated areas dressed in clean coveralls.

.4 After completion of removal work, wire brush, HEPA vacuum and/or wet-sponge surfaces from which asbestos has been removed to remove visible material.

.5 Where Departmental Representative decides complete removal of asbestos containing material is impossible due to obstructions such as structural members or major service elements, and provides written direction, encapsulate material as follows:

.1 Apply penetrating type sealer to penetrate existing sprayed asbestos surfaces uniformly to substrate.

.6 After removal of visible asbestos, and after encapsulating asbestos containing material impossible to remove, wet clean entire work area including Equipment and Access Room, and equipment used in process. After 24 hour period to allow for dust settling, wet clean these areas and objects again. During this settling period no entry, activity, or ventilation will be permitted. After second 24 hour period under same conditions, clean these areas and objects again using HEPA vacuum followed by wet cleaning. After inspection by Departmental Representative apply continuous coat of slow drying sealer to surfaces of work area. Allow at least 16 hours with no entry, activity, ventilation, or disturbance other than operation of negative pressure units during this period.

.7 Work is subject to visual inspection and air monitoring. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.

.8 Cleanup:

.1 Frequently during Work and immediately after completion of work, clean up dust and asbestos containing waste using HEPA vacuum or by damp mopping.

.2 Place dust and asbestos containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.

.3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.

.4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Territorial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.

.5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.4 AIR MONITORING

.1 From beginning of Work until completion of cleaning operations, Departmental Representative will take air samples inside and outside of Asbestos Work Area in

accordance with the requirements of the more stringent of the COHSR and the YT OHS Reg.

.1 Air samples will be collected and analyzed in accordance with NIOSH method 7400.

.2 Air sample results will be provided to the Contractor within 24-hours of sample collection.

.3 Analysis will be conducted by qualified persons or laboratories that take part in a documented QA/QC program for such analysis.

.2 Contractor to stop Work when airborne fibre measurements exceed 0.05 fiber/cubic centimetre (f/cc), when PPE and protection factors are considered, and to correct procedures.

.3 Additional monitoring will be conducted, where possible, to verify procedural corrections were effective.

.4 If air monitoring shows that areas outside Asbestos Work Area are contaminated as determined by the Departmental Representative, Contractor will be notified to maintain and clean these areas in same manner as that applicable to Asbestos Work Area, at no additional cost to the Contract.

.5 When asbestos leakage from Asbestos Work Area has occurred, or is likely to occur Departmental Representative may order Work shutdown and correction of deficiencies.

.1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

.6 If clearance testing is required by a Yukon Government Occupational Health and Safety Officer, Contractor is to coordinate and schedule this testing directly with the Yukon Government, and is to provide schedule notification to the Departmental Representative.

.1 No additional costs will be allowed by Contractor for additional labour or materials required arising from:

.1 Delays associated with Yukon Government’s required testing.

.2 Addressing deficiencies arising from or identified by the Yukon Government Occupational Health and Safety Officer.

.3 Scheduling or completing repeated testing events by the Departmental Representative or the Yukon Government Occupational Health and Safety Officer.

3.5 INSPECTION

.1 Perform inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviations from these requirements that have not been approved in writing by Departmental Representative may result in Work stoppage, at no cost to Owner.

.2 Departmental Representative may inspect Work for:

.1 Adherence to specific procedures and materials.

.2 Final cleanliness and completion.

.3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 American Concrete Institute (ACI), the latest edition of:

.1 SP-66, ACI Detailing Manual.

.2 ASTM International, the latest edition of:

.1 ASTM A82/A82M, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

.2 ASTM A143/A143M, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

.3 ASTM A185/A185M, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.

.4 ASTM A775/A775M, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.

.3 CSA International, the latest edition of:

.1 CSA-A23.1 /A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A23.3, Design of Concrete Structures.

.3 CSA-G30.18, Carbon Steel Bars for Concrete Reinforcement.

.4 CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.5 CAN/CSA-G164 Hot Dip Galvanizing of Irregularly Shaped Articles.

.6 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction.

.4 Reinforcing Steel Institute of Canada (RSIC), the latest edition of:

.1 RSIC, Reinforcing Steel Manual of Standard Practice.

1.2 QUALITY ASSURANCE

Submit in accordance with Section 01 45 00- Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.

.1 Mill Test Report: upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.

.2 Upon request submit in writing to Departmental Representative proposed source of reinforcement material to be supplied.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 10- Product Requirements.

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

.3 Storage and Handling Requirements:

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

.2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Substitute different size bars only if permitted in writing by Departmental Representative.

.2 Reinforcing steel: billet steel, grade 400W, deformed bars to CSA-G30.18, unless indicated otherwise.

.3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18.

.4 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.

.5 Deformed steel wire for concrete reinforcement: to ASTM A82/A82M.

.6 Welded steel wire fabric: to ASTM A185/A185M.

.1 Provide in flat sheets only.

.7 Welded deformed steel wire fabric: to ASTM A82/A82M.

.1 Provide in flat sheets only.

.8 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

.9 Mechanical splices: subject to approval of Departmental Representative.

.10 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

.1 SP-66 unless indicated otherwise.

.2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

.1 Ship epoxy coated bars in accordance with ASTM A775A/A775M.

Part 3 Execution

3.1 PREPARATION

.1 Galvanizing to include chromate treatment.

.1 Duration of treatment to be 1 hour per 25 mm of bar diameter.

.2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A143/A143M.

3.2 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.3 Replace bars, which develop cracks or splits.

3.3 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on placing drawings in accordance with CSA-A23.1/A23.2.

.2 Notify Departmental Representative's 5 business days prior to placing concrete to obtain approval of reinforcing material and placement.

.3 Ensure cover to reinforcement is maintained during concrete pour.

.4 Protect paint coated portions of bars with covering during transportation and handling.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 ASTM International, (latest edition)

- .1 ASTM C260/C260M, Standard Specification for Air-Entraining Admixtures for Concrete.
- .2 ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- .3 ASTM C494/C494M, Standard Specification for Chemical Admixtures for Concrete.
- .4 ASTM C1017/C1017M, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
- .5 ASTM D412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
- .6 ASTM D62, Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
- .7 ASTM D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
- .8 ASTM D1752, Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

.2 Canadian General Standards Board (CGSB), (latest edition)

- .1 CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Damp-proofing and Waterproofing and for Roof Coatings.
- .2 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.3 CSA International, (latest edition)

- .1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA A283, Qualification Code for Concrete Testing Laboratories.
- .3 CSA A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.2 ABBREVIATIONS AND ACRONYMS

.1 Limestone Cement: hydraulic cement, blended hydraulic cement (XXb - b denotes blended) and Portland-limestone cement.

- .1 Type GU, GUb and GUL - General use cement.
- .2 Type MS and MSb - Moderate sulphate-resistant cement.
- .3 Type MH, MHb and MHL - Moderate heat of hydration cement.

.4 Type HE, HEb and HEL - High early-strength cement.

.5 Type LH, LHb and LHL - Low heat of hydration cement.

.6 Type HS and HSb - High sulphate-resistant cement.

.2 Fly ash:

.1 Type F - with CaO content less than 8%.

.2 Type CI - with CaO content ranging from 8 to 20%.

.3 Type CH - with CaO greater than 20%.

.3 GGBFS - Ground, granulated blast-furnace slag.

.4 SF - Silica fume with high silicon dioxide (SiO2) content

.5 N - Natural pozzolans

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Upon request, pre-installation Meetings: in accordance with Section 01 45 00 Quality Control, convene pre-installation meeting one week prior to beginning concrete works.

.1 Ensure speciality contractor - finishing, forming attend.

.1 Verify project requirements.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Provide concrete mix design shop drawings. The shop drawings shall be stamped by a professional engineer registered in the Yukon.

.3 Provide shop drawings showing min. embedment length and adhesive anchoring system for holdowns and dowels to existing and/or new concrete structure. The shop drawings shall be stamped by a professional engineer registered in the Yukon.

.4 Provide testing results reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.

.5 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.

.6 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

.7 Provide two copies of WHMIS MSDS in accordance with Section 01 35 29.06- Health and Safety Requirements.

1.5 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00- Quality Control.

.2 Provide Departmental Representative, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

.1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.

.3 Quality Control Plan: provide written report to Departmental Representative verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

.1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.

.2 Deviations to be submitted for review by Departmental Representative.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

.2 Packaging Waste Management: remove for reuse and return of packaging materials in accordance with Section 01 74 19- Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 DESIGN CRITERIA

.1 Prescription: to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

2.2 MATERIALS

.1 Portland Cement: to CSA A3001, Type GU.

.1 Reduction in cement from Base Mix to Actual Supplementary Cementing Materials (SCMs) Mix, as percentage.

.2 Blended hydraulic cement: Type HSb to CSA A3001.

.3 Portland-limestone cement: Type GUL to CSA A3001.

.4 Supplementary cementing materials: with minimum 20 % GGBFS, by mass of total cementitious materials to CSA A3001.

.5 Water: to CSA A23.1.

.6 Aggregates: to CSA A23.1/A23.2

.7 Admixtures:

.1 Air entraining admixture: to ASTM C260.

.2 Chemical admixture: to ASTM C494. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.

.3 Corrosion-inhibiting admixture: to C 494 Type S.

.4 Lithium-based admixture: to C 494 Type.

.5 Shrinkage-reducing admixture (SRA): to C 494 Type S.

.6 Viscosity-modifying agent (VMA): to C 494 Type S.

.8 Shrinkage compensating grout: premixed compound consisting of metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA A23.1/A23.2.

.1 Compressive strength50MPa at 28 days.

.9 Non-premixed dry pack grout: composition of non-metallic aggregate Portland cement with sufficient water for mixture to retain its shape when made into ball by hand and capable of developing compressive strength of50MPa at28days.

.10 Pre-moulded joint fillers:

.1 Bituminous impregnated fibre board: to ASTM D1751.

.2 Sponge rubber: to ASTM D1752, Type I, flexible grade.

.3 Standard cork: to ASTM D1752, Type II.

.11 Weep hole tubes: plastic.

.12 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel with insulation filled slots.

2.3 MIXES

.1 Provide concrete mix to meet requirements shown on drawing S002, Concrete mix to CSA A23.1.

.1 Ensure materials used in concrete mix have been submitted for testing and meet requirements of CSA A23.1.

.2 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as in Quality Control Plan.

.3 Provide quality management plan to ensure verification of concrete quality to specified performance.

Part 3 Execution

3.1 PREPARATION

.1 Obtain Departmental Representative's written approval before placing concrete.

.1 Provide 5 business days minimum notice prior to placing of concrete.

.2 Place concrete reinforcing in accordance with Section 03 20 00- Concrete Reinforcing.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitate placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Pumping of concrete will not be permitted.

.5 Ensure reinforcement and inserts are not disturbed during concrete placement.

.6 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.7 Protect previous Work from staining.

.8 Clean and remove stains prior to application for concrete finishes.

.9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, workability, air content, temperature and test samples taken.

.10 In locations where, new concrete is dowelled to existing work, drill holes in existing concrete.

.1 Place steel dowels of deformed steel reinforcing bars and pack solidly with epoxy grout to anchor and hold dowels in positions as indicated.

.11 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 INSTALLATION/APPLICATION

.1 Do cast-in-place concrete work to CSA A23.1/A23.2.

.2 Sleeves and inserts:

.1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through joists, beams, column capitals or columns, except where indicated or approved by Departmental Representative.

.2 Where approved by Departmental Representative, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.

.3 Sleeves and openings greater than 100 x 100 mm not indicated, must be reviewed by Departmental Representative.

.4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Departmental Representative before placing of concrete.

.5 Confirm locations and sizes of sleeves and openings shown on drawings.

.6 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.

.3 Anchor bolts:

.1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.

.2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from Departmental Representative.

.1 Formed holes: 100 mm minimum diameter.

.2 Drilled holes: to manufacturers' recommendations.

.3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.

.4 Set bolts and fill holes with shrinkage compensating grout.

.4 Grout under base plates and machinery using procedures in accordance with manufacturer's recommendations which result in 100 % contact over grouted area.

.5 Finishing and curing:

.1 Finish concrete to CSA A23.1/A23.2.

.1 Composite deck shall be trowelled.

.2 Use procedures as reviewed by Departmental Representative to remove excess bleed water. Ensure surface is not damaged.

.6 Joint fillers:

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Departmental Representative.

.2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.3 Locate and form isolation joints as indicated.

.4 Install joint filler.

.5 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12 mm of finished slab surface unless indicated otherwise.

SURFACE TOLERANCE

.7 Concrete tolerance to CSA A23.1 to tolerance schedule as indicated.

3.3 FIELD QUALITY CONTROL

.1 Site tests: conduct tests as follows in accordance with Section 01 45 00- Quality Control and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.1 Concrete pours.

.2 Slump.

.3 Air content.

.4 Compressive strength at 7 and 28 days.

.5 Air and concrete temperature.

.2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1/A23.2.

.1 Ensure testing laboratory is certified to CSA A283.

.3 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing laboratory and Departmental Representative.

.4 Contractor will pay for costs of tests as specified in Section 01 45 00 Quality Control.

.5 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.

.6 Inspection or testing by Departmental Representative will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

3.4 CLEANING

.1 Clean in accordance with Section 01 74 00- Cleaning.

.2 Waste Management: separate waste materials for reuse in accordance with Section 01 74 21.

.1 Divert unused concrete materials from landfill to local facility after receipt of written approval from Departmental Representative.

.2 Provide appropriate area on job site where concrete trucks and be safely washed.

.3 Divert unused admixtures and additive materials (pigments, fibres) from landfill to official hazardous material collections site as approved by Departmental Representative.

.4 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

.5 Prevent admixtures and additive materials from entering drinking water supplies or streams.

.6 Using appropriate safety precautions, collect liquid or solidify liquid with inert, non-combustible material and remove for disposal.

.7 Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 ASTM International Inc., (latest edition)

- .1 ASTM A36/A36M, Standard Specification for Carbon Structural Steel.
- .2 ASTM A193/A193M, Standard Specification for Alloy-Steel and Stainless-Steel Bolting Materials for High-Temperature or High-Pressure Service and Other Special Purpose Applications.
- .3 ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .4 ASTM A325, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- .5 ASTM A325M, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength Metric.
- .6 ASTM A490M, Standard Specification for High-Strength Steel Structural Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints Metric.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-85.10-99, Protective Coatings for Metals.

.3 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA).

- .1 Handbook of the Canadian Institute of Steel Construction.
- .2 CISC/CPMA Standard 2-75, Quick-Drying Primer for use on Structural Steel.

.4 Canadian Standards Association (CSA International), (latest edition)

- .1 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CAN/CSA-S16, Limit States Design of Steel Structures.
- .4 CAN/CSA-S16, North American Specifications for the Design of Cold Formed Steel Structural Members.
- .5 CSA W47.1, Certification of Companies for Fusion Welding of Steel.
- .6 CSA W48, Filler Metals and Allied Materials for Metal Arc Welding.
- .7 CSA W55.3, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
- .8 CSA W59, Welded Steel Construction (Metal Arc Welding).

.5 Master Painters Institute

- .1 MPI-INT 5.1-08, Structural Steel and Metal Fabrications.
- .2 MPI-EXT 5.1-08, Structural Steel and Metal Fabrications.

.6 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International

.1 NACE No. 3/SSPC SP-6-06, Commercial Blast Cleaning.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Samples:

.1 Upon request prepare sample of typical exposed structural connections in accordance with AISC Specifications of Architecturally exposed structural steel for approval of Departmental Representative. Samples to be judged upon alignment of surfaces, uniform contact between surfaces, smoothness and uniformity of finished welds. When approved, sample units will serve as a standard for workmanship, appearance and material acceptable for entire project.

.2 Source Quality Control Submittals:

.1 Upon request submit 2 copies of mill test reports 4 weeks prior to fabrication of structural steel.

.1 Mill test reports to show chemical and physical properties and other details of steel to be incorporated in project.

.2 Provide mill test reports certified by metallurgists qualified to practise in Yukon Territory, Canada.

.3 Fabricator Reports:

.1 Provide structural steel fabricator's affidavit stating that materials and products used in fabrication conform to applicable material and products standards specified and indicated.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 51 00 -Temporary Facilities.

.2 Deliver materials in manufacturer's original, undamaged containers with identification labels intact.

.3 Packaging Waste Management: remove for reuse and return of crates in accordance with Section 01 74 21-Waste Management and Disposal.

Part 2 Products

2.1 DESIGN REQUIREMENTS

.1 Connections not detailed on the structural drawings shall be designed and detailed in accordance with requirements of and CAN/CSA-S16 to resist forces, moments, shears and allow for movements indicated.

.2 Shear connections:

.1 Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction" when connection for shear only (standard connection) is required.

.2 Select or design connections to support reaction from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam, when shears are not indicated.

.3 For composite construction select or design minimum end connection to resist reaction resulting from factored movement resistance as tabulated in the "Handbook of the Canadian Institute of Steel Construction" assuming 100% shear connection with depth of steel deck and/or slab shown on drawings.

.4 Upon request submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Yukon Territory, Canada for non standard connections.

2.2 MATERIALS

.1 Structural steel: to CAN/CSA-S16.

.2 Anchor bolts: to ASTM A36/A36M.

.3 High strength anchor bolts: to ASTM A193/A193M, Grade B7.

.4 Bolts, nuts and washers: to ASTM A490/A490M.

.5 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.

.6 Shop paint primer: to CISC/CPMA2-75 solvent reducible alkyd, grey.

.7 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of 600 g/m

.8 Shear studs: to CSA W59, Appendix H.

2.3 FABRICATION

.1 Fabricate structural steel in accordance with CAN/CSA-S16.

.2 Install shear studs in accordance with CSA W59.

.3 Continuously seal members by where indicated. Grind smooth.

.4 Provide holes in top flanges. Unless noted otherwise weld threaded studs to bottom flanges for attachment of wood nailers.

2.4 SHOP PAINTING

.1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16.

.2 Clean members, remove loose mill scale, rust, oil, dirt and foreign matter. Prepare surface according to NACE No.3/SSPC-SP-6.

.3 Apply one coat of primer in shop to steel surfaces to achieve minimum dry film thickness of 0.076mm to 0.1016mm, except:

.1 Surfaces to be encased in concrete.

.2 Surfaces to receive field installed stud shear connections.

.3 Surfaces and edges to be field welded.

.4 Faying surfaces of slip-critical connections.

.5 Below grade surfaces in contact with soil.

.4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.

.5 Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.

.6 Strip paint from bolts, nuts, sharp edges and corners before prime coat is dry.

Part 3 Execution

3.1 APPLICATION

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

3.2 GENERAL

.1 Structural steel work: in accordance with CAN/CSA-S16.

.2 Welding: in accordance with CSA W59.

.3 Design, install and supply the structural steel member including connections as shown on structural drawings and general notes on S001.

.4 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

3.3 CONNECTION TO EXISTING WORK

.1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Departmental Representative for direction before commencing fabrication.

3.4 MARKING

.1 Mark materials in accordance with CSA G40.20/G40.21. Do not use die stamping. When steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.

.2 Match marking: shop mark bearing assemblies and splices for fit and match.

3.5 ERECTION

.1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16.

.2 Field cutting or altering structural members: to approval of Departmental Representative.

.3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.

.4 Continuously seal members by continuous welds where indicated. Grind smooth.

3.6 FIELD QUALITY CONTROL

.1 Upon request provide inspection and testing of materials and workmanship.

.2 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Departmental Representative.

.3 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Departmental Representative

.4 Upon request submit test reports to Departmental Representative within 3 weeks of completion of inspection.

.5 Contractor will pay costs of tests as specified in Section 01 45 00 Quality Control.

3.7 FIELD PAINTING

.1 Paint in accordance with Section 09 90 00 – Painting and Coating.

.1 Touch up damaged surfaces and surfaces without shop coat with primer to NACE No.3/SSPC-SP-6 except as specified otherwise. Apply in accordance: MPI Architectural Painting Specification Manual.

3.8 CLEANING

.1 Clean in accordance with Section 01 74 00- Cleaning.

.2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21- Waste Management and Disposal.

END OF SECTION

PART 1 GENERAL

1.1 Description

.1 Fabrication, supply and installation of miscellaneous metal fabrications complete with fasteners, anchorage and accessories.

.2 Include installation of scheduled metal items supplied by Others. Coordinate with said supplier sections.

.3 All misc. steel in contact with pressure treated lumber shall be hot dip galvanized.

.4 Coordinate with Section 05 12 23- Structural Steel for Buildings, to avoid duplication or omission. In the case of conflict with notes on the drawings or other specifications, the more stringent will apply.

1.2 Related Sections

.1	Section 01 33 00	Submittal Procedures
.2	Section 01 45 00	Quality Control
.3	Division 03	Concrete
.4	Section 05 12 23	Structural Steel for Buildings
.5	Section 06 10 00	Rough Carpentry
.6	Section 06 20 00	Finish Carpentry & Millwork

1.3 References

.1 All codes and documents referred to in this Section shall be the current adopted edition.

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

.1 ASTM A53/A53M-05, Specification for Pipe: Steel, Black, Hot-Dipped, Zinc-Coated, Welded and Seamless.

.2 ASTM A307-076, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB-1.181-99, Ready-Mixed, Organic Zinc-Rich Coating.

.4 Canadian Standards Association (CSA International)

.1 CAN/CSA-G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel.

.2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CAN/CSA-S16-09, Design of Steel Structures.

.4 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.

.5 CSA W59-03, Welded Steel Construction (Metal Arc Welding).

.6 CAN/CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures and W59 Welded Steel Construction (Metal Arc Welding).

.7 CAN/CSA S136, Cold Formed Steel Structural Members.

.5 National Building Code of Canada (NBCC), 2015.

.6 CISC Code of Standard Practice.

1.4 Submittals

.1 All submittals shall be in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheets for manufactured items.

.3 Shop Drawings

.1 Submit shop drawings prepared under the supervision of a Professional Engineer registered in Yukon. Drawings of components designed by the fabricator shall be signed and sealed by the Registered Professional Engineer.

.2 Shop drawings shall complete details necessary for fabrication and erection of the component parts of the structure, including location, type, size and extent of all welds. Splices not shown on the shop drawings will not be accepted.

.3 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

.4 Where metal fabrication items interface with equipment and other building elements, this section shall be responsible for obtaining all measurements of said items prior to preparation of shop drawings.

.5 Review of shop drawings constitutes review of general methods only and will not include approval of dimensions, figures or quantities. The Supplier is responsible for structural design, correct fabrication and proper fitting of various items.

.6 Submit samples of each finish of metal for Departmental Representative's approval, as requested.

1.5 Letters of Assurance

.1 The Engineer responsible for sealing the engineered shop drawings shall submit to the Departmental Representative, Schedule B-1 Assurance of Professional Design and Commitment for Field Review and Schedule B-2 Summary of Design and Field Review Requirements with the shop drawings.

.2 Engineer shall provide field review of the installation and submit to the Departmental Representative's Schedule C-B Assurance of Professional Field Review and Compliance upon completion of the work.

1.6 Quality Assurance

.1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.

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

.3 All Steel Fabricators must have full approval of the Canadian Welding Bureau under CSA W47.1.

1.7 Storage and Handling

.1 This section shall be responsible for the protection of all metal work during fabrication, shipping, storage and construction. All small bends and damage shall be reported to the Departmental Representative for instructions. Metal work, which is bent, broken or otherwise damaged, shall be repaired or replaced at no cost to the Departmental Representative.

.2 This section shall be responsible for proper scheduling of delivery and erection for the metal fabrications, all in accordance with the construction schedule.

1.8 Coordination with Other Sections

.1 Supply all necessary instructions and drawings to other trades for setting bearing plates, anchor bolts, and other members that are built in with the work of other sections. Supply the necessary material in accordance to the construction schedule.

1.9 Examination

.1 All dimensions shall be taken from the drawings and verified against site conditions. Be responsible for the correctness of such measurements and report to the Departmental Representative in writing all dimensional discrepancies prior to commencing work. Verify location of anchor bolts and embedded steel and ensure that work prepared by other trades is at a proper elevation, on line, level and true.

1.10 Inspection and Testing

.1 Allow free access to all parts of the works for the purposes of inspection at all times.

.2 Prior to commencement of work provide a schedule of shop fabrication.

.3 The Departmental Representative may reject, at any time during the progress of the work, a piece of material for any member which he may find defective or not in accordance with the detailed drawings. This material may be rejected notwithstanding any previous acceptance, and components so rejected shall be replaced at no expense to the Owner. In case of dispute, the decision of the Departmental Representative shall be final.

PART 2 PRODUCTS

2.1 Materials

.1 All steel shall be new unless otherwise indicated and be of sizes and shapes listed in the current CISC handbook and as indicated on the drawings.

.2 Rolled shapes and welded wide flange sections shall be to CAN 3-G40.21-350W.

.3 Plates and flat bars shall be to CAN 3-G40.21-300W.

.4 Hollow structural sections shall be to CAN 3-G40.21-350W Class C.

.5 High strength bolts shall be to ASTM A325, Type 1; nuts to ASTM A563, HEX.

.6 Misc. bolts and nuts to ASTM F1554, Grade 36.

.7 Steel pipe: to ASTM A53/A53M, Grade B, standard weight, (Schedule 40) and extra strong (Schedule 80).

.8 Welding materials: to CSA W59.

.9 Welding electrodes: to CSA W48 Series.

.10 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

.11 Stainless steel: to ASTM A666, type 304, number 4 finish.

.12 Checker plate: to ASTM A786.

2.2 Fabrication

.1 Fabricate work in accordance with reviewed shop drawings, square, true, straight and accurate to required size, with joints closely fitted and properly secured and in accordance with CSA S16-09.

.2 Where possible, fit and shop assemble work, ready for erection.

.3 All Welding shall be to CSA W59, by welders qualified in accordance with CSA W47.1.

.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush. Fabricate all miscellaneous metalwork shown and detailed in the drawings and listed in this section in the quantities required.

.5 Assemble built-up work in the shop and match-mark for correct field erection.

.6 All copes, mitres and butt cuts in surfaces exposed to view shall be made with uniform gaps of 3.0 mm if detailed to be open joints or in uniform contact if detailed without gaps.

.7 Weld in such a manner as to avoid distortion, discolouration or damage to the members.

.8 Weld exposed exterior work continuously to provide a proper weathering seal to prevent leakage and other damage.

.9 Weld interior work continuously along the entire line of contact except where spot welding is indicated or permitted.

.10 Grind welds smooth where exposed to view.

.11 All hollow structural sections shall be closed airtight with end plates sealed with welds.

.12 All plates and shapes shall be inspected visually for laminations. Repair plates or shapes which contain laminations in a manner to be reviewed by the Departmental Representative.

.13 Provide all required holes in metalwork for attaching other materials.

.14 Drill for countersunk screws if exposed to view unless otherwise shown or accepted by the Departmental Representative.

.15 Locate holes in structural members for connections or for other purposes so as not to cause appreciable reduction in the strength of members.

.16 Reinforce all work to suit the purpose for which it is intended and to withstand design loads.

.17 Fabricate work square, true, straight and accurate to detail with sharply, defined profiles.

.18 Fabricate curved work to smooth, uniform constant radii as detailed.

.19 Joints in materials shall be cut to form fine hairline joints flush with adjacent surfaces.

.20 Provide suitable temporary bracing as required to maintain alignment during shipment and erection.

2.3 Metal Finishes

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m^2 to CAN/CSA-G164 (MT-5). Locate galvanizing exterior drain/vent holes such that all holes will be to underside of installed item in final position.

.2 All metal fabrications in exterior and noted interior locations, including steel angles associated with masonry, shall be hot dip galvanized after fabrication.

.3 Shop coat primer for non-painted steel: to CAN/CGSB-1.40.

.4 Zinc primer for non-painted steel: zinc rich, ready mix to CAN/CGSB-1.181.

.5 Primers for exterior exposure shall be zinc chromate Type 1, conforming to CGSB 1-GP-40d.

.6 Primers for interior exposure shall be CISC/CPMA Standard 1-73 Primer or other pre-approved.

2.4 Isolation Coating

.1 Isolate aluminum from following components, by means of bituminous paint:

.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.

.2 Concrete, mortar and masonry.

.3 Preservative-treated wood.

2.5 Shop Preparation for Painting

.1 Clean metal of all loose mill scale, rust, oil, dirt and all other foreign matter.

.2 All steel shall be primed except for steel to be encased in concrete, steel to be fireproofed, steel which will receive shear studs, and faying surfaces of friction connections.

.3 Clean interior metal to be painted in accordance with SSPC SPI Solvent Cleaning followed with SSPC SP.6 Commercial Blast Cleaning.

.4 Clean exterior metal to be painted in accordance with SSPC SPI Solvent Cleaning followed with SSP C SP.10 Near White Metal Blast Cleaning.

.5 Remove or repair sharp edges, burrs, weld spatter and other defects to steel members prior to application of primers.

.6 After erection and after connections are completed, provide a field touch up coat of primer to all surfaces that had no shop coat, or have been chipped or scraped.

2.6 Shop Painting

.1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items. For items to be finish painted apply primers in accordance with Section 09 90 00. Apply primer as specified under Section 09 90 00 in accordance with manufacturer's directions. Ensure that primer is applied within 8 hours of completion of surface preparations.

.2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.

.3 Clean surfaces to be field welded; do not paint.

.4 All exterior metal in contact with masonry or concrete shall be back-primed before installation.

.5 If the correct primer is not applied by this section of the Work, this section is responsible for removal of the incorrect primer, re-conditioning the surface and applying the correct primer as specified, including removal and re-installation of the affected work as required.

.6 Primer applied to surfaces not properly prepared in accordance with specified SSPC preparations will be rejected by the Departmental Representative and shall be removed, brought up to the specified requirements and re-installed by the Contractor at no additional cost to the Departmental Representative.

PART 3 EXECUTION

3.1 Erection

.1 Supervise the setting of bases, anchor bolts, and other metal to concrete or masonry connections. Cutting of base plates to accommodate anchor bolts shall be cause for rejection of base plates.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Provide components for building by other sections in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CAN/CSA-S16, or weld.

.7 Hand items over for casting into concrete to appropriate trades together with setting templates.

.8 Install all temporary bracing which is required to stabilize the work against wind, earthquake and construction loads. Keep structure true and plumb until completion of the building.

.9 As erection progresses, the work shall be securely bolted up to take care of all dead loads, wind, earthquake, and erection stresses. Any failure to make proper and adequate provisions for stresses during erection shall be solely the responsibility of this section.

.10 The Metal Fabrications Erector shall be responsible for the design of all hooks, erection connections and handling gear.

.11 Whenever piles of materials, erection equipment, or other loads are carried during erection, make proper provision to safely accommodate stresses resulting from same.

.12 All metal fabrication shall be assembled and erected in accordance with the reviewed shop and erection drawings and specified reference standards.

.13 Metal fabrication work shall be carefully located at the proper elevation and rigidly secured in place, using steel shims. All spaces under the steel shall then be filled with non-shrink, pre-mix, non-metallic grout, pre-approved by the Departmental Representative.

.14 Plumb, level and align individual members of metal work as specified in CSA S16-09.

.15 All exposed metal work shall be finished and assembled to provide the best possible visual appearance to the satisfaction of the Departmental Representative.

.16 Obtain written permission from Departmental Representative prior to field cutting or altering of structural members.

.17 Clean and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.

.18 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.2 Welding

.1 All welding shall be done by the shielded metal-arc method in accordance with the requirements CSA W59. The welding operators shall have passed within the preceding six (6) months, the qualification test as set forth in CSA W47.1.

.2 Submit welding procedures prepared and sealed by a Professional Engineer registered in the Province of British Columbia familiar with the discipline to the Departmental Representative for his examination and comments.

.3 Surfaces to be welded shall be free from loose scale, rust, paint, or other foreign matter. Where weld material is deposited in two or more layers, each layer shall be cleaned before the next layer is deposited. Care shall be taken to minimize stresses due to heat expansion, contraction and distortion by using proper sequence in welding and by approved methods.

.4 Welding consumables for all processes shall be fully approved by the Canadian Welding Bureau and certified by the manufacturers as complying with the requirements of this specification. Such certificates shall be no more than two years old.

.5 Electrode strengths to be equal to E70xx or better.

.6 All exposed welding shall be finished to provide the best possible visual appearance to the satisfaction of the Departmental Representative.

3.3 Schedule of Metal Fabrications

.1 The following schedule of Metal Fabrications covers the work to be done in general. It is not intended as a complete list. Include items shown on the drawings or obviously required to make a complete job. Coordinate work with that of other sections to ensure that all items are provided.

.2 Misc. Steel frames, brackets and supports.

.1 Fabricate and install as detailed all misc. frames, brackets, and supports.

.2 Coordinate dimensions and profiles with interfacing sections.

3.4 Cleaning

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

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

END OF SECTION

PART 1 GENERAL

1.1 Reference Standards

.1 Pressure treat wood in accordance with CAN/CSA-080-08.

1.2 Waste Management and Disposal

.1 Separate and recycle waste materials in accordance with Section 01 74 21 – Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.

.4 Divert unused wood materials from landfill to recycling facility approved by Departmental Representative.

.5 Do not dispose of preservative treated wood through incineration, or into water courses.

.6 Do not dispose of preservative treated wood with materials destined for recycling or reuse.

1.3 Submittals

.1 All submittals shall be in accordance with Section 01 33 00 – Submittal Procedures.

PART 2 PRODUCTS

2.1 Preservative Treatment

.1 New lumber exposed to weather, standing water, copings, window linings, roof curbs, wood in contact with concrete: factory treated with clear, Ammoniacal Copper Quat (ACQ-B) or Copper Azole (CA) preservative to CAN/CSA-080.2 to obtain an average net retention of 4.0kg/m³ by assay. All new plywood exposed to weather must be treated to CAN/CSA-080.9.

.2 Material shall bear Canadian Wood Preservers Bureau (CWPB) stamps.

2.2 Fire Retardant Treatment

.1 Treat scheduled wood and plywood material by pressure impregnation with fire resistive chemicals in accordance with CAN/CSA-080-M or ASTM D-2898 to provide a flame spread ration of less than 25.

.2 Fire retardant treated wood to bear underwriter's label or be accompanied by a certificate in a form acceptable to the Departmental Representative showing compliance.

.3 Conform strictly to the manufacturer's directions for delivery, handling and storage of treated wood.

.4 Use galvanized steel fasteners for fastening fire retardant treated wood products.

.5 An example of an accepted product is "Dricon FRT". Other products having the same proven characteristics will not be excluded

2.3 Borate Treatment:

.1 Where noted, to CSA 080-1 (Wood Preservation)

PART 3 EXECUTION

3.1 Preparation

.1 Treat surfaces of material with wood preservative, before installation.

.2 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

3.2 Preparation

.1 Comply with A.W.P.A.M. 4-77.

.2 Remove with fine sandpaper, chemical deposits on treated wood to receive applied finish.

.3 Treat cuts with hand-applied preservative.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Restoration and repair of finish carpentry including:
- .1 Dormers
- .2 Soffits and Fascia
- .3 Front Entry Door

1.2 RELATED REQUIREMENTS

.1 Section 01 32 33 - Photographic Documentation

.2 Section 01 51 00 – Temporary Facilities

.3 Section 02 41 00 – Selective Demolition

1.3 REFERENCES

.1 ASTM International (ASTM)

- .1 ASTM F1667-17, Standard Specification for Driven Fasteners: Nails, Spikes and Staples

.2 Canada's Historic Places

- .1 Standards and Guidelines for the Conservation of Historic Places in Canada

.3 CSA Group

- .1 CSA O141-05(R2014), Softwood Lumber
- .2 CSA B111-1974(R2003), Wire Nails, Spikes and Staples

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Review methods and materials related to the designated conservation treatment finish carpentry work including, but not limited to, the following:

- .1 Verify project requirements, including mock-up requirements
- .2 Verify substrate conditions.
- .3 Review proposed repair and replacement methods and materials.
- .4 Co-ordinate products, installation methods and techniques.
- .5 Review temporary protection requirements.
- .6 Existing conditions that may require notification of Departmental Representative before proceeding.

.2 Preinstallation Meeting: Conduct meeting at Project site.

.3 Coordination: Undertake each step of finish carpentry restoration and repair including tagging, disassembly, surface preparation, repair, painting and installation under review of Departmental Representative.

.4 Sequencing: Do not start repair and replacement work before having a photographic record of interior and exterior surfaces of finish carpentry.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Action Submittals:

.1 Preconstruction Submittals:

.1 Submit a description of methods and materials of work to be employed repair and restoration of finish carpentry.

.2 Provide photographic documentation of finish carpentry before, during and after the works in accordance with Section 01 32 33 – Photographic Documentation.

.3 Report on existing and substrate conditions & anomalies.

.4 Obtain written approval of products, materials, operations, schedules and methods from Departmental Representative before starting with work of this Section.

.2 Product Data: Submit product data sheets and MSDS information for each product or material used in the execution of the work of this Section.

.3 Shop Drawings: Indicate plans and elevations of units; materials, surface grain directions, details at 1:2 scale for items of finish carpentry. Show profiles of components, joint details, and anchorage details.

.4 Samples: Submit 300 mm long of each new fabricated replacement part.

.3 Informational Submittals:

.1 Qualification Statement: Restorer qualifications, including previous projects.

1.6 QUALITY ASSURANCE

.1 Restorer Qualifications:

.1 Company specializing in performing the work of this section.

.2 Successful completion of at least three projects of similar scope and complexity.

1.7 MOCK-UP

.1 Construct Mock-Ups in accordance with Section 01 45 00 - Quality Control.

.2 Construct Mock-Ups under supervision of Departmental Representative, to demonstrate a full understanding of specified procedures, techniques and formulations.

.3 Include the following:

.1 Repair of wood checking, moderate weathering, and severe weathering

.2 Each profile of finish carpentry for repair

.4 Allow 96 hours for review of mock-up by Departmental Representative.

.5 Repeat mock-up until satisfactory results are obtained to approval of Departmental Representative.

.6 When accepted by Departmental Representative in writing, mock-up will demonstrate minimum standard for this work. Accepted Mock-up may remain as part of finished

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 21 –

Construction Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

.1 Replacement Wood Members: Clear lumber of historic-precedent species, to CSA O141, air dried to 15% moisture content, growth rings and grain orientation to match parts being repaired. Finger-jointing not permitted.

.1 Profiled replacement wood members to match existing components.

.2 Use material to match existing as close as possible in terms of species, finish and dimension.

.2 Wood Preservative:

.1 Organic purified raw and boiled linseed oil.

.2 Turpentine.

.3 Finishing Nails: to CSA B111 or ASTM F1667, No. 304 stainless steel finishing nails.

.4 Nails: to CSA B111 or ASTM F1667, stainless steel, size and type to suit application.

.5 Screws: for Dutchmen type repairs, brass or stainless steel sized to fit.

.6 Wood Repair Materials:

.1 Liquid Wood Consolidant: Two-component compound forming a slow-curing, low- viscosity liquid epoxy consolidant designed for saturating and encapsulating wood decay, or priming damaged areas. Specifically used for consolidating and stabilizing pockets of wood decay, checks, fissures and other surface imperfections due to weather exposure or insect infestation. Applications include porous end grain, window sills, sash, jambs and trims.

.1 Basis-of-Design Products: RotFix Epoxy Wood Sealer and Consolidant manufactured by System Three Resins (Industrial Formulators); LiquidWood manufactured by Abatron; ConServ 100 Flexible Epoxy Consolidant manufactured by ConServ; Rhino Wood Repair System manufactured by Stell-Chem.

.2 Wood Epoxy Filler: Two-component, shrink-fee adhesive compound for filling cavities, voids and surface imperfections in wood. Flexible to withstand expansion and contraction of wood, firm enough to replace damaged portions of wood. Easily tooled, carved, planed, drilled or sanded. Capable of accepting nails and screws. Able to be painted or stained solid.

.1 Basis-of-Design Products: Sculpwood Putty or Paste Epoxy Repair Compounds manufactured by System Three Resins (Industrial Formulators); WoodEpox manufactured by Abatron; ConServ Flexible Epoxy Patch 200 series manufactured by ConServ; Rhino Wood Repair System manufactured by Stell-Chem.

.3 Adhesive: Weather-resistant multi-purpose structural epoxy adhesive, medium viscosity, 2:1 mix ratio, room temperature or heat cure. Room temperature working time of 60-90 minutes, complete cure in 24 hours at 22 deg C. Capable of producing specific bond-line thickness, and prevent joint starvation from over- clamping. Can be machined, sanded, drilled, tapped, and painted. Solvent-free with 100% reactive components.

.1 Basis-of-Design Products: Cold Cure General Purpose Epoxy Resin System, G2 Epoxy Glue manufactured by System Three Resins (Industrial Formulators), or product acceptable to Departmental Representative manufactured by West System Epoxies.

Part 3 Execution

3.1 EXAMINATION

.1 Examine areas and conditions under which work is to be performed and notify Departmental Representative in writing of conditions detrimental to the proper and timely completion of the work.

.2 Notify Departmental Representative of conditions relevant to the Work, but not described in Drawings, including evidence of deficiencies, fungal or insect attack which may affect the scope of work and durability of the finished product.

.3 Verify adequacy of backing and support.

3.2 PROTECTION

.1 Protect adjacent surfaces during repair of finish carpentry to prevent damage.

.2 Use ground protection under work areas to collect debris and waste.

3.3 PREPARATION

.1 Follow designated substances guidelines for lead abatement for paint removal.

.2 Carefully clean, scrape and wash finish carpentry items as required to assess condition, and to determine extent of repairs required.

.3 Verify condition and extent of repair work with Departmental Representative. Submit report documenting existing conditions and agreed to extent of repair work to Departmental Representative before starting repair work.

3.4 WOOD REPAIR AND REPLACEMENT

.1 Severe Deterioration:

.1 Replace deteriorated finish carpentry components with new wood as specified in this Section.

.2 For items being disassembled, photograph in accordance with Section 01 32 33 - Photographic Documentation, and submit to Departmental Representative for review before proceeding with work.

.3 Before disassembling, label components using indelible black marker on painter's tape.

.1 Use two labels per component. Ensure labels show clearly in photographs.

.2 Include compass orientation, and any other information required on labels to ensure that component is reinstalled in its original location.

.4 Immediately following disassembly of each component, label components using indelible black marker on gasket paper, securely fasten to back of component with staple gun.

.1 Use two labels per component and record same information as labels on front of components.

.2 Store original elements. Turn over to Parks Canada as directed.

.5 Tools:

.1 Use fine pry bars, such as Richardson bars, designed for this type of work, not pry bars intended for nail pulling, etc.

.2 Use fine sharp tool to cut paint films in construction joints before attempting to disassemble.

.3 Take care with tools to avoid marring, crushing or splitting components.

.6 Upon removal of components, snap iron nails off flush with backside. For wire nails pull nails through from backside. Do not drive nails back through finished surfaces.

.7 Cut back damaged or decayed wood to a point 10 mm beyond the last evidence of decay or as indicated on Drawings.

.8 Use Dutchmen type repairs, including wood splicing or inserts and weather-resistant glue, where wood is broken or missing. Fit to hairline joint, glue and nail. Stapling not permitted.

.1 Match replacement components to size, profile and grain of existing finish carpentry.

.2 Scarf in replacement components.

.3 Make joints tight so that after finishing they are visible only upon close inspection.

.4 Attach replacement materials to the parent piece, not adjacent components.

.9 Trial fit joints before fastening in place. Adjust as necessary to ensure close accurate fit with adjacent surfaces.

.10 Use thinned linseed oil-based glazing compound on otherwise untreated areas to fill checks and open joints. Allow time to dry before sanding and painting.

.2 Moderate Deterioration:

.1 Clean and dry surfaces before applying liquid wood consolidant and epoxy filler. Apply products in accordance with manufacturers' instructions.

.2 Consolidate soft wood with liquid wood consolidant.

.3 Repair cracks and holes in wood with wood epoxy filler. Tool cured patch to match adjacent area.

.4 Use thinned linseed oil-based glazing compound on otherwise untreated areas to fill checks and open joints. Allow time to dry before sanding and painting.

.5 Allow proper curing of consolidant and filler before painting.

.3 Minor Deterioration:

.1 Once wood is stripped bare, apply linseed oil turpentine mix 50/50 to renew wood.

.2 Use thinned linseed oil-based glazing compound to fill checks and open joints. Allow time to dry before sanding and painting.

.3 Consolidate soft wood with liquid wood consolidant. Clean and dry surfaces before applying liquid wood consolidant. Apply consolidant in accordance with manufacturer's instructions.

.4 Missing Elements:

.1 Replace missing finish carpentry items with new wood as specified in this Section.

.2 Use Dutchmen type repairs, including wood splicing or inserts and weather-resistant glue. Fit to hairline joint, glue and nail. Stapling not permitted.

.1 Match replacement components to size, profile and grain of existing finish carpentry.

.2 Scarf in replacement components.

.3 Make joints tight so that after finishing they are visible only upon close inspection.

.4 Attach replacement materials to the parent piece, not adjacent components.

.3 Trial fit joints before fastening in place. Adjust as necessary to ensure close accurate fit with adjacent surfaces.

.5 Raised Knots:

.1 Remove loose paint.

.2 Level surface by planing and sanding.

.3 Apply wood epoxy filler to voids in and around knot.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 American National Standards Institute/National Particleboard Association (ANSI/NPA) (latest edition)

- .1 ANSI/NPA A208.1 Particleboard.

.2 ASTM International, (latest edition)

- .1 ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .3 ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength.
- .4 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .5 ASTM D 5055, Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists.
- .6 ASTM D 5456, Standard Specification for Evaluation of Structural Composite Lumber Products.
- .7 ASTM F1667 Standard Specification for Driven Fasteners: Nails, Spikes and Staples.

.3 Canadian General Standards Board (CGSB), (latest edition)

- .1 CAN/CGSB-11.3-M87, Hardboard.
- .2 CAN/CGSB-71.26-M88, Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.

.4 Canadian Wood Council, (latest edition)

- .1 Wood Design Manual
- .2 Engineering Guide for Wood Frame Construction

.5 CSA International, (latest edition)

- .1 CAN/CSA-A123.2, Asphalt Coated Roofing Sheets.
- .2 CSA B111, Wire Nails, Spikes and Staples.
- .3 CSA O86 Engineered Design in Wood
- .4 CSA O112.9, Evaluation of Adhesives for Structural Wood Products (Exterior Exposure).
- .5 CSA O121, Douglas Fir Plywood.
- .6 CSA O141, Softwood Lumber.
- .7 CSA O151, Canadian Softwood Plywood.
- .8 CSA O153, Poplar Plywood.
- .9 CSA O325, Construction Sheathing.

.10 CAN/CSA-S406, Construction of Preserved Wood Foundations.

.11 CAN/CSA-Z809, Sustainable Forest Management.

.6 Forest Stewardship Council (FSC), (latest edition)

.1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.

.7 National Lumber Grades Authority (NLGA), (latest edition)

.1 Standard Grading Rules for Canadian Lumber.

.8 National Research Council Canada (NRC)

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

.9 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)

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

.10 Underwriters' Laboratories of Canada (ULC), (latest edition)

.1 CAN/ULC-S706, Standard for Wood Fibre Insulating Boards for Buildings.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit shop drawings of used hangers and ties including fasteners for approval prior to installation.

.2 Submit custom made hangers (see drawing 2/S105) shop drawing for approval prior to installation.

.3 Submit CCMC Product Evaluation Report for engineered wood products.

.4 Submit manufacturer’s installation instructions.

1.3 SUSTAINABLE DESIGN SUBMITTALS

.1 Upon request submit manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.

.2 Low-Emitting Materials:

.1 Submit listing of adhesives and sealants used in building, showing compliance with VOC and chemical component limits or restriction requirements.

.2 Submit listing of composite wood products used in building, stating that they contain no added urea-formaldehyde resins, laminating adhesives used in building, stating that they contain no urea-formaldehyde .

.3 Include MSDS sheets indicating resin type for structural composite lumber and agrifibre materials.

1.4 DELIVERY, STORAGE, AND HANDLING

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

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

.3 Storage and Handling Requirements:

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

.2 Store materials off ground with moisture barrier at both ground level and as a cover forming a well-ventilated enclosure, with drainage to prevent standing water.

.3 Stack, lift, brace, cut and notch engineered lumber products in strict accordance with manufacturer’s instructions and recommendations.

.4 Store and protect architecturally exposed lumber from nicks, scratches, and blemishes.

.5 Replace defective or damaged materials with new.

.6 Store separated reusable wood waste convenient to cutting station and work areas.

Part 2 Products

2.1 SUSTAINABILITY CHARACTERISTICS

.1 Provide wood framing products as specified and with the following sustainability characteristics.

.2 Lumber, Finger Jointed Lumber , I-Joists , structural composite lumber (SCL) , : to be CAN/CSA-Z809 or FSC or SFI certified.

.3 Plywood: urea-formaldehyde free and certified to, CAN/CSA-Z809 or FSC or SFI.

.4 Adhesives: limit 120 g/L maximum to GS-36.

.5 Provide engineered wood products certified as meeting requirements of respective ANSI standard for formaldehyde emissions and low VOC emissions when tested in accordance with ASTM D6330.

.6 Provide fiberboard with minimum 80 % recycled content.

2.2 STRUCTURAL FRAMING

.1 Lumber: as shown on drawing S001 and S002, moisture content 19% (S-dry) or less in accordance with following standards:

.1 CSA O141.

.2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Glued end-jointed (finger-jointed) lumber NLGA Special Products Standard SPS, are not acceptable for studs.

.3 Structural Composite Lumber (SCL) as shown on S001 and S002 in accordance with ASTM D 5456, for following uses:

.1 Laminated veneer lumber (LVL): beams as indicated.

.2 Parallel strand lumber (PSL): headers as indicated.

.3 Laminated strand lumber (LSL): studs as indicated.

.4 Oriented strand lumber (OSL): studs as indicated.

2.3 FURRING AND BLOCKING

.1 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:

.1 S2S is acceptable

.2 Board sizes: "Standard" or better grade.

.3 Dimension sizes: "Standard" light framing or better grade.

.4 Post and timbers sizes: "Standard" or better grade.

.2 Where indicated, provide pressure treated materials for furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers in accordance with Section 06 05 00 – Wood Treatment.

2.4 PANEL MATERIALS AND APPLICATION

.1 Roof sheathing:

.1 Plywood, as shown on drawing S001 and S002.

.2 Exterior wall sheathing:

.1 Plywood, as shown on drawing S001 and S002

.3 Subflooring:

.1 Plywood, as shown on drawing S001 and S002

.4 Electrical equipment mounting boards:

.1 Plywood, CSP, square edge18.5mm thick.

.2 Fire retardant treated in accordance with Section 06 05 00 - Wood Treatment.

.5 Miscellaneous architectural plywood, as detailed: typ. 19mm u.n.o.

.6 Where indicated, provide pressure treated panel materials in accordance with Section 06 05 00.

2.5 MATERIALS AND PRODUCTS FOR TREATED WOOD FOUNDATIONS

.1 Refer to Section 06 05 00 – Wood Treatment.

2.6 ACCESSORIES

.1 Subflooring adhesive: to CAN/CGSB-71.26, cartridge loaded.

.2 General purpose adhesive: to CSA O112.9.

.3 Supply all fasteners as per general notes on S001

.4 Nails, spikes and staples: to ASTM F1667.

.5 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.

.6 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.

.7 Unless noted otherwise on drawing S001, joist hangers, connectors and fasteners: in accordance with accepted shop drawings, minimum 1 mm thick sheet steel, galvanized to minimum ZF001 coating designation.

.8 Nailing discs: flat caps, minimum 25 mm diameter, minimum 0.4 mm thick, sheet metal, fibre, formed to prevent dishing. Bell or cup shapes not acceptable.

.9 Roof sheathing H-Clips: formed "H" shape, thickness to suit panel material, extruded 6063-T6 aluminum alloy type approved by Departmental Representative.

.10 Fastener Finishes:

.1 Galvanizing: to ASTM A653 G60, and 2000-hour salt-spray tested.

.2 Use galvanized fasteners for exterior locations, and where in contact with preservative treated lumber.

.11 Wood Preservative: as specified in Section 06 05 00 - Wood Treatment.

.12 Sill Plate Gasket: Closed cell polyethylene foam gasket in width to match sill plate width, 6 mm thick.

Part 3 Execution

3.1 EXAMINATION

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

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 SYSTEMS INTEGRATION

.1 Install air barrier and vapour retarder sheeting around framing members to ensure continuity of protection and to lap and seal to main sheets.

.2 Install insulation in exterior wall framing cavities that will not be accessible after completion of framing.

.3 Install sill plate gasket in continuous lengths between concrete surfaces and wood framing.

3.3 FRAMING INSTALLATION

.1 Install engineered framing and plant fabricated structural wood components, including all hangers, connectors and fasteners, in accordance with accepted shop drawings and manufacturers' instructions.

.2 Install framing as noted on drawing S001 and as per details on structural drawings.

.3 All new and/or existing lumber, timber, engineered wood in contact with new additional steel plate reinforcement shall eb finished with a weather resistant coating.

.4 Install members true to line, levels and elevations, square and plumb.

.5 Construct continuous members from pieces of longest practical length.

.6 Install spanning members with "crown-edge" up.

.7 Select exposed framing for appearance. Install lumber materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.

.8 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.9 Countersink bolts where necessary to provide clearance for other work.

.10 Install specified panel product for each application.

.11 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

.11 Install new roof sheathing as per 2.4.1.

3.4 CONSTRUCTION OF TREATED WOOD FOUNDATIONS

.1 Construct preserved wood foundation in accordance with CAN/CSA-S406.

.2 Place cut ends up where studs cut to length.

.3 Treat cuts and bored holes in accordance with Section 06 05 00.

.4 Retreat all cut ends of pressure treated lumber which require on-site cutting.

3.5 FURRING AND BLOCKING

.1 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding electrical equipment mounting boards, and other work as required.

.2 Install furring to support siding applied vertically where there is no blocking and where sheathing is not suitable for direct nailing.

.1 Align and plumb faces of furring and 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 using steel fasteners.

.5 Install sleepers as indicated.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.

3.7 WASTE MANAGEMENT

.1 Separate waste materials for recycling in accordance with Section 01 74 21-Waste Management and Disposal.

.2 Re-use scrap lumber to the greatest extent possible. Separate scrap lumber for use on site as accessory components, including shims, bracing, and blocking.

.3 Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill. Prevent saw dust and wood shavings from entering the storm drainage system.

.4 Do not burn scrap lumber that has been pressure treated.

.5 Do not send lumber treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

3.8 PROTECTION

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

.2 Repair damage to adjacent materials caused by rough carpentry installation.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

.1 CSA International

.1 CSA O322-02(R2007), Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.

.2 CAN/CSA-S406-92(R2008), Construction of Preserved Wood Foundations.

.3 CAN/CSA-Z809-08, Sustainable Forest Management.

.2 Forest Stewardship Council (FSC)

.1 FSC-STD-01-001-2004 FSC Principle and Criteria for Forest Stewardship.

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

.1 SCAQMD Rule 1113-A2011, Architectural Coatings.

.2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

.4 Sustainable Forestry Initiative (SFI)

.1 SFI-2010-2014 Standard.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

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

.3 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Upon request, submit project Waste Reduction Workplan highlighting recycling and salvage requirements.

.2 Wood Certification: submit vendor's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.

.3 Low-Emitting Materials:

.1 Submit listing of adhesives and sealants used in building, showing compliance with VOC and chemical component limits or restriction requirements.

.2 Submit listing of laminate adhesives used in building, stating that they contain no urea-formaldehyde.

1.3 QUALITY ASSURANCE

.1 Identify pieces of treated lumber and plywood used in preserved wood foundations by CSA O322 certification stamp.

.2 Sustainable Standards Certification:

.1 Certified Wood: submit listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.

1.4 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

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

.2 Store and protect wood from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Lumber and panel materials a shown on S002: to CAN/CSA-S406.

.1 CAN/CSA-Z809 or FSC or SFI certified.

.2 SCAQMD Rule 1113 - Architectural Coatings.

.2 All lumber unincised.

.3 Preservatives: maximum VOC 350 g/L.

.4 Fasteners and connectors, moisture barrier, sealant and field applied preservative: to CAN/CSA-S406.

.5 All fasteners and metal connectors in contact with pressure treated lumber shall be hot dip galvanized.

Part 3 Execution

3.1 EXAMINATION

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

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 CONSTRUCTION

.1 Construct preserved wood foundation in accordance with CAN/CSA-S406.

.2 Place cut ends up where studs cut to length.

3.3 INSTALLATION

.1 Install preserved wood foundation in accordance with CAN/CSA-S406.

.2 All new and/or existing lumber, timber, engineered wood in contact with new additional steel plate reinforcement shall eb finished with a weather resistant coating.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

.3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21- Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 GENERAL

1.1 Related Work

.1 Section 05 50 00 - Metal Fabrications

.2 Section 06 10 00 - Rough Carpentry

.3 Section 09 90 00 - Painting and Coating

1.2 Reference Standards

.1 Do millwork to "custom" grade to Millwork Standards of the Architectural Woodwork Manufacturer's Association of Canada, latest edition.

1.3 Submittals

.1 All submittals shall be in accordance with Section 01 33 00- Submittal Procedures.

.2 Shop Drawings

.1 Clearly indicate details of construction, profiles, jointing, fastening and other related details.

.2 Submit shop drawings to all interfacing sections requiring coordination.

.3 Samples

.1 Submit duplicate 300X300mm samples of each type of solid wood or veneer plywood to receive stain or transparent finish, in accordance with Section 01 33 00.

.2 Submit duplicate 600mm long samples of each type of trim and moulding.

1.4 Coordination & Verification

.1 Verify all dimensions & existing conditions on job site prior to all shop fabrication and work on site. Where major discrepancies occur, alert Departmental Representative immediately.

.2 Coordinate work of this section with that of wall, ceiling-framing, electrical and mechanical sections where millwork and trim interface with drywall partitions, ceiling suspension, plumbing, electrical outlets, etc.

.3 It shall be the responsibility of this section to verify the dimensions and installation details for all Departmental Representative supplied equipment and furnishings requiring cut-outs, adaptations and interfacing with millwork items.

.4 This Section shall be responsible for obtaining all dimensions and mounting requirements of components (fire alarm, pull station, fire extinguisher, signage, etc.) for building safety / service panel and incorporating into shop drawings to be turner-over to and coordinated with Section 05 50 00 for preparation of aluminum sheet.

1.5 Inspection

.1 Architectural woodwork shall be manufactured and installed to AWMAC Quality Standards ("Custom" Grade) and shall be subject to an inspection at the plant and/or site, by an appointed inspector approved by the M.M.A.B.C. (the BC Chapter of AWMAC). Such inspection costs shall be included in the tender price for this project. Shop drawings shall be submitted for review before any work is commenced. Where it is deemed necessary by the Departmental Representative, a sample cabinet (consisting of a minimum of 1

drawer, 1 door, showing precisely the materials, hardware and the type of construction the manufacturer intends to use), shall be submitted for inspection.

.2 Any work which does not meet AWMAC Quality Standards as specified, shall be replaced by this Trade Contractor at no additional cost to the Departmental Representative and to the satisfaction of the Departmental Representative and the inspector.

1.6 Guarantee

.1 This Trade Contractor shall furnish the Departmental Representative with a two (2) year M.M.A.B.C. (The BC Chapter of AWMAC) Guarantee Certificate or an equivalent maintenance bond, to the full value of the architectural woodwork sub-contract, certifying that the architectural woodwork supplied will be in accordance with the Standards incorporated in the AWMAC Quality Standards manual, latest edition.

.2 The Guarantee shall cover replacing and refinishing to make good any defects in architectural woodwork due to faulty workmanship or defective materials supplied by this Trade Contractor, which appear during a two (2) year period following the substantial completion of the Project.

1.7 Waste Management and Disposal

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 Waste Management and Disposal and the Waste Reduction Workplan, and the Waste Management Plan to the maximum extent economically possible.

PART 2 PRODUCTS

2.1 Materials

.1 Softwood lumber: to C.S.A. 0141-1970 and National Lumber Grades Authority requirements, with maximum moisture content of 6% for interior applications as follows:

.1 Lumber selected for paint finish: Fir species to AWMAC Custom Grade.

.2 Decorative veneer: Premium Baltic Birch Plywood for “clearcoat” finish.

.3 Douglas Fir plywood: to C.S.A. 0121-M1978, good one side, sanded grade.

.4 Shelving plywood: premium birch ply, sanded two sides, appearance grade for painting.

.5 Nails and staples: to C.S.A. B111-1974, galvanized for interior highly humid areas and plain finish elsewhere.

.6 Fiberboard: Standard of Acceptance: 'Ranger Premium MDF Board', 'Medite'. Medium Density (MDF) to ANSI/A208.2 and tested in accordance with ASTM D1037. All MDF shall be free of urea-formaldehyde.

2.2 Cabinet Hardware

.1 Hinges: High quality all metal concealed European (Blum) style for overlay door application.

.2 Door and Drawer Locks: National # LOC 8178-26D, KD, Pin type.

.3 Door and Drawer Pulls: Richelieu No. 33206, 102mm D-pull, 26D finish

.4 Drawer Slides: Accuride, K & V, Roll-it or equal. Full extension type. Heavy duty for large drawers and where noted.

.5 Adjustable shelving wall track and brackets: equal to Roll-it, K and V.

.6 All shelf pins shall be metal.

.7 Cord grommets: Mockett "Large Oval King Kong" #90 matte black plastic.

.8 Keypad tray Support Mechanism: Complete with up/done, in/out, tilting and swivel adjustment features. Equal to "Mini-Arm" Model 14725 as manufactured by Weber Knapp Inc.

.9 Edge trim for birch plywood wall dados: Clear anodized aluminum trim by Schluter ("Schiene"). Sizes to match plywood thickness.

2.3 Millwork Components Supplied by Other Sections

.1 From Section: 05 50 00:

.1 Cut, punched, and brake-formed 0.080" clear anodized aluminum sheet for this Section to mastic apply to MDF backing for mounting panel of building safety components.

.2 Miscellaneous aluminum trim, track and glazing channels for millwork divider panels and display glazing.

.2 This Section shall be responsible for coordination and supplying above noted section all dimensions, details and shop drawings for above referenced components.

PART 3 EXECUTION

3.1 Cabinetwork

.1 Cabinet doors shall be A.W.M.A.C. type overlay 19mm thick, flush.

.2 Set nails and screws, apply stained plain wood filled to indentations, sand smooth and leave ready to receive finish.

.3 Install and adjust cabinet hardware for shelves, doors, and drawers. Recess shelf standards unless noted otherwise. Shelving to be adjustable unless otherwise noted.

.4 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures. Make allowances for all wiring required within cabinet units, and conceal where possible. Refer to Mechanical and Electrical Drawings.

.5 All shelving shall be plywood (no MDF shelving), birch veneer where painted.

.6 Fit painted shelves with hardwood edging.

.7 Details are shown on drawings for appearance purposes only and are not intended to supersede these specifications for fabrication methods or grades of material. Submit details with shop drawings.

.8 Unless otherwise indicated, interiors of cabinets, all surfaces of concealed shelving and insides of drawers (except front panels) shall be melamine or shop-painted as scheduled.

.9 Veneer backing shall be MDF where possible, birch ply elsewhere. Veneering to AWMAC standards for "custom" grade. No veneer backing for Plastic Laminate doors as per AWMAC standards.

3.2 Interior Trim

.1 Standing and running trim for transparent and painted finish shall be A.W.M.A.C. Custom Grade construction.

.2 Trim shall be as detailed.

3.3 Installation

.1 Set and secure cabinetwork and finish carpentry items in place rigid, plumb and square.

.2 Use purpose designed fixture attachments for wall mounted components.

.3 Use threaded steel concealed joint fasteners to align and secure adjoining cabinet units, counter tops, and shelving.

.4 When necessary to cut and fit on site, make material with ample allowance for cutting. Provide trim for scribing and site cutting.

.5 Permanently fix cabinet and counter bases to floor using appropriate angles and anchorages.

.6 Counter-sink all semi-concealed anchorage devices used to wall mount components and conceal with solid plugs of species to match surrounding wood. Place flush with surrounding surfaces.

.7 Carefully scribe cabinetwork which is against other building materials, leaving gaps of 0.8mm maximum. Do not use additional overlay trim for this purpose.

.8 Install and adjust all cabinet hardware to ensure smooth and correct operation.

.9 Site-install all computer wire grommets into millwork as directed by Departmental Representative and indicated on drawings.

.10 Use proper exterior and interior panel adhesives for shop-bonding aluminum sheets to backing. Use proper pressing techniques to eliminate potential "Telegraphing" and "oil canning".

.11 Install all Departmental Representative-supplied equipment and components associated and interfaced with Finish Carpentry and Millwork.

.12 Use proper panel adhesives for shop-bonding aluminum sheets to backing. At building safety/ service panel, use proper pressing techniques to eliminate potential "Telegraphing" and "oil canning".

3.4 Fire Retardant Treatment (Where Required)

.1 Treat wood material by pressure impregnation with fire resistive chemicals in accordance with CAN/CSA-080-M or ASTM D-2898 to provide a flame spread ration of less than 25.

.2 Fire retardant treated wood to bear underwriter's label or be accompanied by a certificate in a form acceptable to the Departmental Representative showing compliance.

.3 Conform strictly to the manufacturer's directions for delivery, handling and storage of treated wood.

.4 Use galvanized steel fasteners for fastening fire retardant treated wood products.

3.5 Schedule of Finish Carpentry, Millwork Items

.1 Supply and install the following carpentry and millwork items as shown and detailed or as specified, complete with all anchors and fastenings required for a complete installation.

.2 Countertops, cabinets, cupboards, shelving, misc. trim, paneling, sills, wall dado and trim, and installation of grilles and like items.

.3 Millwork enclosures of new equipment as scheduled and detailed.

.4 Installation of cabinet hardware, door hardware and finish components.

.5 Installation of scheduled and noted Departmental Representative supplied equipment and components.

.6 Fabrication and installation of aluminum covered building safety / service panel.

END OF SECTION

PART 1 GENERAL

1.1 Work Included

.1 Thermal Batt Insulation
.2 Rigid Thermal Insulation.
.3 Foil Faced Polyisocyanurate Foam Wall Insulation
.4 Rigid Mineral Wool Roof Insulation

1.2 Related Work

.1 Section 01 45 00 - Quality Control
.2 Section 07 21 29 - Sprayed Thermal Insulation
.3 Section 07 27 13 - Exterior Wall Membrane
.4 Section 07 41 00 - Metal Roof Cladding

1.3 Submittals

.1 All submittals shall be in accordance with Section 01 33 00 – Submittal Procedures.

.2 Samples: Submit representative samples of each specified insulation material, insulation clips, adhesives, fasteners, tapes and other material for review.

.3 Manufacturer's Product Data:

.1 Submit manufacturer's product data sheets for products proposed for use in the work of this section.

.2 Submit data and installation instructions for materials and prefabricated devices, providing descriptions sufficient for identification at the site.

.3 Submit data from manufacturer's or independent laboratory indicating compatibility and adhesive results of proposed materials.

1.4 Reference Standards

.1 Model National Energy Code for Buildings (NECB).

.1 Wall and grade slab assemblies to NECB 2015.

PART 2 PRODUCTS

2.1 Thermal Batt Insulation for Wood Studs and Framing

.1 Friction-fit mineral wool fibre blankets, made from basalt rock and slag, thickness as noted on drawings, width-sized to fit wood studs and framing and possessing the following characteristics:

.1 CAN/ULC-S702-97	Thermal Insulation Mineral Fibre for Buildings	Type 1, Complies
.2 CAN4-S114	Determination of Non-Combustibility	Non-Combustible
.3 CAN/ULC S102	Surface Burning Characteristics	Flame Spread = 0 Smoke Developed = 0
.4 CCM Evaluation Listing	MasterFormat 07210: Mineral Fibre Batt Insulation	12018-L
.5 Density	(32 kg/m^3) meets NBC/ULC Standards of CAN/ULC-S702-97 4.8 kg/m^2 @ 150mm 2.8 kg/m^2 @ 89mm 2.0 kg/m^2 @ 65mm	

.2 Thermal resistance rating: RSI value per 25mm @ 24C = 0.70 m^2K/W (=R-4 per 25mm)

.3 An example of the product: Comfortboard 80" by Rockwool. Other products having the same characteristics will not be excluded.

2.2 Rigid Thermal Insulation

.1 Extruded polystyrene insulation panels, purpose made for scheduled use including below floor panels and roof panel insulation, conforming to CAN/ULC-S701 Type 4, ship lapped edges, and meeting the values of the following table of properties:

Property and Test Method	**Value**
Thermal Resistance per 25 mm ASTM C518 @ 24°C mean Temp., m^2•°C/W min., R-value (RSI)	5.0 (.87)
Compressive Strength(1), ASTM D1621, kPa, min.	210
Water Absorption, ASTM D2842, % by volume, max.	<0.7
Water Vapour Permeance, ASTM E96, perm (ng/Pa•s•m^2)	0.9 (50)
Maximum Use Temperature °C	74
Coefficient of Linear Thermal Expansion, ASTM D696, mm/m•°C	6.3 x 10^{-2}

.2 Use high density (structural grade) material (210KPA) below slabs-on-grade and imposed loads.

2.3 Foil- faced Polyisocyanurate Foam Wall Insulation

.1 Rigid, closed cell polyisocyanurate foam core factory-bonded on both sides to aluminum foil facers and confirming to the following table:

Characteristic	Units	Nominal Value	Specification	Test Method	Standard limi
Length Tolerance:	mm(in)	±4(±0.16)	-	ASTM 303	±5(0.2)
Width Tolerance:	mm(in)	±2(±0.08)	-	ASTM 303	±5(0.2)
Thickness	mm(in)	100(0.4)	-	ASTM 303	+5(+0.20) -2.5(-0.10)
Dimensional Stability: (at 70%, 97% R.H) MD: XD:	%	 PASS PASS	CAN/ULC-S704	ASTM D2126	MAX: ±2
Water Vapour Permeance:	Ng/Pa.s.m^2	PASS	CAN/ULC-S704	ASTM E96	≤15
Water Absorption:	% by Vol.	PASS	CAN/ULC-S704	ASTM D2842	MAX:3.5
Compressive Strength:	kPa(psi)	PASS	CAN/ULC-S704	ASTM D1621	MIN:110(16)
Thermal Resistance Value	RSI (BTU.hr.ft^2.F)	4.32(24.8)		ASTM C518	-
Flexural Strength:	kPa	618/805	CAN/ULC-S704	ASTM C203	≥275
Tensile Strength:	kPa	69	CAN/ULC-S704	ASTM D1623	≥24
Service Temperature	C/F	-40 to 100/ -40 t0 212	-	-	-
Flame Spread Index: Canada:	-	≤500	-	CAN/ULC-S102	-
Smoke Density Index: Canada:	-	≤55	-	CAN/ULC-S102	-

2.4 Rigid Mineral Wool Insulation

.1 Rigid, high density, non-combustible stone wool insulation.

.2 Moisture resistant and vapour permeable

.4 Insulation shall confirm to the following Table of Performance:

	Performance	Test Standard
Compliance	Mineral Fibre Block and Board Thermal Insulation-Type IVB Compliant Mineral Fibre Thermal Insulation for Buildings-Type I Compliant	ASTM C612 CAN/ULC S702
Reaction to Fire	Flame Spread Index=0; Smoke developed index=0 Flame Spread Index=0; Smoke developed index=0 Determination of non Combustibility of Building Materials- Non Combustible	ASTM E84 (UL 723) CAN/ULC S102 CAN/ULC S114
Density	Actual Density – 11 lbs/ft^3 (176 kg/m^3)	ASTM C303
Corrosion Resistance	Stress Corrosion Cracking Tendency of Austenitic Stainless Steel – Passed Corrosion of Steel - Passed Corrosion to Aluminum - Passed	ASTM C795 ASTM C665 ASTM C665
Thermal Resistance	R Value/ inch @ 75 degrees F 4hr.ft^2.F/Btu RSI value/ 25.4mm @24 degrees C 0.70 m^{2}K/W	ASTM C518 (C177)
Reaction to Moisture	Moisture Soption – 0.28% Water Vapour Transmission, Desiccant method – 2160ng/Pa.s.m^2 (35 perm) Water Absorption - 1.2% Determination of fungi resistance - Passed	ASTM C1104 ASTM E96 ASTM C209 ASTM C1338
Compressive Strength	584 psf (28kPa) @ 10% compression 1566 psf (75kPa) @ 25% compression	ASTM C165

.5 An example of the product: "Comfortboard ™ 110" as manufactured by Rockwool of Milton, ON. Other products having the same characteristics will not be excluded.

PART 3 EXECUTION

3.1 Batt Insulation Installation

.1 Install insulation, in thicknesses as indicated, in such manner as to maintain continuity of thermal protection to building elements and spaces. Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.

.2 Do not compress insulation to fit into spaces.

.3 Overlap thermal insulation sufficiently to maintain continuity.

.4 Loose-fill all exterior hollow metal door frames with thermal batt insulation.

3.2 Rigid Mineral Wool Insulation Installation

.1 Install insulation, in thicknesses as indicated, in such manner as to maintain continuity of thermal protection to building elements and spaces. Fit insulation closely into cavities and around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.

.2 Install Rigid Mineral Wool Insulation in 50mm thick layers, and as indicated on the drawings.

.2 Insulation will not be left without protection at the end of a day's work. Seal all insulation panels. Remove when resuming work.

END OF SECTION

PART 1 GENERAL

1.1 Work Included

.1 Sheet-applied self-adhered vapour permeable combination air/vapour barrier sheathing membrane at rain screen cavity assemblies and where indicated.

.2 Sheet-applied self-adhered non-vapour permeable flashing/transition membrane. ("peel and stick")

.3 Liquid -Applied flashing membrane.

.4 Polyethelene Film

.5 Vapour Control Detailing Tape

1.2 Related Work

.1 Section 06 10 00 - Rough Carpentry

.2 Section 07 41 00 - Metal Roof Cladding

1.3 Quality Assurance

.1 Qualifications: Work of this section shall be executed by competent installers with experience in application of products, systems and assemblies specified and with approval and training of product manufacturer.

.2 Conduct quality control in accordance with Section 01 45 00.

.3 All sealants, primers, mastics and adhesives associated with the sheathing membrane shall be products of said sheathing membrane manufacturer.

1.4 Submittals

.1 All submittals shall be in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product data sheets:

.1 Submit manufacturer's product data sheets for products proposed for use in the work of this section.

.3 Sample Installations / Mock-ups:

.1 Provide Sample Installations / Mock-ups of the following typical Air Barrier transition conditions (ref. noted Architectural drawing details):

.1 The roof to wall interface detail & roof membrane pre-stripping (5 of A2.620)
.2 The interior floor-to-wall transition (5 of A2.610)
.3 The upper to lower roof transition (6 of A2.620)
.4 The cupola (8 of A2.610)
.5 The interior partition wall air barrier detailing (1 of A2.610)

.2 Locate at the place of work as part of final installation.

.3 Do not proceed until Sample Installation / Mock-up has been reviewed and approved by the Departmental Representative.

.4 Samples:

.1 At the Departmental Representative's request, samples of materials shall be submitted for approval, prior to commencing work concerned.

1.5 Product Delivery, Storage and Handling

.1 Deliver and store all materials in their original packaging in undamaged condition, sealed with labels intact, having manufacturer's name, brand, weight, CSA and other references to accepted standards clearly shown.

.2 Make all necessary arrangements with regard to delivery and storage on the site with the Departmental Representative and schedule deliveries accordingly. In general, deliver material as required for installation and keep site storage to a minimum.

.3 Provide all plant and equipment necessary for off-loading of materials to complete the work of this section.

.4 Protect materials from damage, weather and store in a dry place.

.5 Handle materials and equipment in strict accordance with manufacturer's recommendations. Damaged or deteriorated materials shall be removed from premises.

1.6 Job Conditions

.1 Conform to membrane manufacturer's requirements for minimum application temperatures and humidity. Check surfaces and areas specified and shown to receive membrane.

.2 Report any unsatisfactory conditions and/or surfaces to the Departmental Representative in writing. Starting work shall imply acceptance of surfaces and conditions.

.3 Take all necessary measurements and levels at the building. The work shall be laid out to accurately fit the conditions at the building and with adjacent work.

.4 Notify the Departmental Representative of any variations beyond the accepted tolerances in the substrate or in the adjacent work.

.5 Provide forced air circulation during curing period for enclosed applications.

.6 Low temperature application:

.1 Perform adhesion test for membrane when ambient temperature is below -5°C. Sheathing membrane manufacturer must produce both “summer” and “winter” (low temp.) grades.

.2 Proceed with work when temperature is (or predicted) to fall below -5°C ambient temperature only with the mutual documented agreement of inspection and testing company, manufacturer and applicator.

.7 Do not perform installation during rainy or inclement weather or on wet or frost covered surfaces.

.8 Provide temporary protection of the applied membrane to prevent mechanical damage or damage from spillage of oil or solvents.

1.7 Performance Requirements

.1 Sheathing membrane system shall perform as a continuous air barrier and liquid water drainage plane flashed to discharge incidental condensation or water penetration to the exterior of the building envelope while allowing vapour within the wall to escape to the exterior.

.2 The vapour impermeable membrane system is employed as a transition membrane between envelope components and other membranes and waterproofing systems. Ensure compatibility between systems.

.3 The foil-faced membrane flashing shall perform as a detailing flashing by providing continuity at interruptions in sheathing systems at aluminum windows.

.4 All self-adhered membrane systems shall accommodate substrate movement, construction material changes, and transitions at perimeter conditions without deterioration and air leakage exceeding the specified limits and requirements, or interruption in the drainage plane.

.5 Self-adhered membrane systems shall be joined in a weathertight and flexible manner to air barrier material of adjacent building envelope systems, employing transition membrane, allowing for relative movement of systems due to thermal and moisture variations and creep. Transition membranes shall be continuously installed at all building locations exemplified by details 1 to 4 (walls) and 5-6 (floors) on drawing sheet A2.610, typical.

.6 Provide temporary protection of the applied membrane to prevent mechanical damage or damage from spillage of oil or solvents.

1.8 Mock-ups / Sample Installations

.1 Provide the following mock-ups or sample installations of typical membrane installations, for review by the Departmental Representative before undertaking the work:

.1 Floor Sheathing transition membrane at exterior walls, per details 5 & 6 / A2.610;

.2 Exterior-Interior Wall transition membrane, per details 1 to 4 / A2.610

PART 2 PRODUCTS

2.1 Self-Adhered Sheathing Membrane (Vapour Permeable)- Dormer Walls

.1 Description: Self-adhering vapour permeable air barrier membrane composed of triple layer laminated polypropylene facers and underside of self-adhering material covered with a silicone release film.

.2 Thickness: 0.6 mm (24 mil) for 50 mm minimum side laps and 75 mm minimum end laps.

.3 Physical properties as follows:

Property	Standard	Value
Tensile strength, MD/XD	ASTM D882	5.95 kN/m / 3.65 kN/m
Tear resistance, MD/XD	CAN/CGSB 51.33-M89	64 N / 54 N
Water vapour permeance	ASTM E96-B	8.7 perm
	ASTM E96-A	7.6 perm
Cold bending at -30°C (-22°F) Initial Ageing as per CGSB 51.32, 25 cycles	CAN/CGSB 51.33-M89	No cracking
Dimensional stability at 85°C (185°F), MD/XD	ASTM D1204	-0.45 / 0.11%
Plywood adhesion	ASTM D3330	356 N/m

Lap joint strength	ASTM D1876	300 N/m
Adhesion after elevated temperature exposure AAMA 711-05, level 3, 7 days @ 80°C (176°F)	ASTM D3330	1200 N/m
Air permeance @ 75 Pa	ASTM E2178	0.0025 $L/m^2.s$*
Nail sealability	ASTM D1970	Must Pass

.4 An example of the products: "Sopraseal Stick VP" by Soprema Waterproofing.

.5 Other products with similar characteristics and proven long term adhesion to moist substrates will not be excluded.

2.2 Self-Adhered Flashing/Transition Membrane ("peel and stick", non-permeable)

.1 Multi-purpose, self-adhering detailing membrane for use at door/window openings other interruptions in the wall envelope, and where indicated.

.2 Description: Self-adhering modified bituminous non-permeable membrane system consisting of SBS modified bitumen and a tri-laminated woven polyethylene facer. The underface shall be covered with a silicone release paper or film. Membrane shall be available in "summer" and "winter" grades and shall comply with the following physical properties:

.1 Thickness: 1.0 mm (40 mils) minimum.

.2 Application temperature: as per manufacturer's printed installation instructions.

.3 Min. tensile strength to ASTM D5147: 11.3/15.4 kN/m (64/88 lb/in).

.4 Min. tensile strength to ASTM D412: 11.2/31.1 MPa.

.5 Static puncture: 400 N (90 lb) to ASTM D5602; 747 N (168 lb) to ASTM E154.

.3 Primer: as manufactured by membrane manufacturer specifically for membrane.

.4 Termination mastic: as recommended by membrane manufacturer.

.5 Ensure that self-adhering membrane is compatible with and will adhere permanently to all interfacing substrate materials and systems, including foil-faced membrane (2.2) and Roofing underlayment (Section 07 41 00).

.6 If required by the Departmental Representative, demonstrate accelerated long term adhesion to all substrate appropriate to this Project. Refer to Section 01 45 00.

.7 Example of the products:

.1 Protecto Wrap "100/40"

.2 Grace Construction Products 'Perm-A-Barrier Wall Membrane'.

.3 Soprema 'Sopraseal Stick 1100T Summer Grade and Winter Grade with 'Elastocol Stick' primer.

.8 Other products having the same characteristics will not be excluded.

2.3 Liquid-Applied Flashing Membrane

.1 Liquid-applied flashing membrane for use as a sealant at penetrations to the wall sheathing membrane, as a detailing sealant and as noted and detailed.

.2 Material shall be a gun grade waterproofing, adhesive and detailing compound composed

of 99% solids, roller/trowel/brush applied, single component, high performance, elastomeric, silyl-terminated polyester coating/sealant exhibiting the combined benefits of silicone and urethane. Product shall meet all current VOC requirements and contain no solvents or isocyanates.

.3 Liquid-applied flashing system shall comply with the following properties when cured:

.1	Hardness, Shore A	40—45
.2	Tensile Strength	180 Psi
.3	Elongation at Break	400%
.4	Peel Strength	25 pli
.5	Accelerated Weathering	Must Pass
.6	Water Vapour Transmission	14 perms @ 12 mils
.7	Surface Burning ASTM E84	Flame Spread: 0 Smoke Developed: 15 NFPA and ICC Class A Building Material

.4 Uncured properties:

.1	Tack Free Time	<30 minutes
.2	Cure Rate	3/16 inch/24 hours
.3	Volatile Organic Content	1.5% by wt. 27 g/Lt .2 lbs/gal
.4	Water Vapour Transmission	6.34 grains/hour/Ft^2

.5 An example of the product: “R-Guard Fast Flash” as manufactured by Prosoco. Other products having the same characteristics will not be excluded.

2.4 Vapour Controlling Detailing Tape

.1 Where indicated and required to provide vapour and air passage protection at awkward access locations.

.2 Single-sided, strongly adhesive plastic type, available in 100 and 150mm wide rolls and employed in conjunction with a companion primer.

.3 Examples of the products: “SIGA 100 and 150” tape and “SIGA Dockskin” primer, both as manufactured by Rissan Products. Other products having similar characteristics will not be excluded.

PART 3 EXECUTION

3.1 Preparation

.1 Preparation of all surfaces to receive self-adhering membranes including substrate, joints, cracks, coves etc. shall be carried out in accordance with manufacturer's written directions.

.2 Ensure that all substrate surfaces are smooth, dry and firm. Remove any frost, ice, loose particles, ridges, laitance, cracks, grease, asphalt, oil and other foreign matter which could

prevent adhesion of the membrane to the substrate.

.3 Do not install membranes until other work which penetrates membrane has been completed.

.4 Seal around membrane penetrating elements in accordance with manufacturer's printed installation instructions.

3.2 Priming

.1 All surfaces to receive self-adhering membrane shall be primed at the rate recommended by the manufacturer. Primer shall be uniformly applied.

.2 Open time of 30 minutes shall be allowed before installation of self-adhering membrane.

3.3 Sheathing Membrane Installation

.1 Install membrane in accordance with manufacturer's printed instructions over flashings and corner reinforcement.

.2 Begin installation at the base of the wall placing top edge of membrane immediately below materials protruding from substrate.

.3 When properly positioned, place against surface by pressing firmly into place. Roll membrane with extension-handled countertop roller immediately after placement.

.4 Overlap horizontally-adjacent pieces 50 mm and roll seams.

.5 Bottom edge shall be slit to fit around penetrations. Membrane shall overlap the membrane sheet below by 50 mm. Roll firmly into place.

.6 Seal around materials penetrating membrane with termination mastic. At end of each working day, seal top edge of membrane to substrate with termination mastic.

.7 Do not allow the rubberized asphalt surface of membrane to come in contact with polysulfide sealants, creosote, uncured coal tar products or EPDM.

.8 Do not expose membrane to sunlight for more than thirty days prior to enclosure.

.9 Apply a bead or towel coat of mastic along membrane edges, seams, cuts, and penetrations.

.10 Roll membrane with 75 mm wide hand roller.

.11 Tie into adjacent wall systems and roof systems for continuous air barrier at building envelope.

.12 Flashing and Corner Reinforcing:

- .1 Where applicable, bring flashing a minimum of 150 mm onto horizontal surfaces and a minimum of 200 mm up walls from horizontal elevation shown.
- .2 Stagger flashing and membrane seams.
- .3 Install flashing to protrusions, expansion joints, control joints and the like. Bring flashing a minimum of 150 mm onto the membrane.
- .4 Wrap air barrier membrane into jambs and sills at openings. Terminate membrane at points that will prevent visibility from interior.

.13 Inspection: Inspect membrane for punctures, misaligned seams and fishmouths, apply additional layer of membrane over affected area, extending minimum of 150 mm beyond damaged area in all directions.

.14 Coordinate proper construction of the roof/wall intersection to maintain the continuity of the air barrier system from the wall to the roofing membrane system.

3.4 Transition/Flashing and Membrane Installation ("peel and stick")

.1 Apply self-adhering membranes to surfaces as indicated on drawings and as specified.

.2 Application of membrane, including temperature limitations, curing requirements and all other application procedures shall be carried out in accordance with membrane manufacturer's written directions.

.3 Coordinate proper construction of roof/wall junctions between Section 07 27 13 and interfacing materials and systems so as to maintain continuity of the air barrier from wall to roof.

.4 Cut and seal membrane around protrusions to form tight air seal.

.5 Apply trowelled bead of mastic to all terminations at end of each day's work.

.6 Inspect membrane thoroughly before being covered and make any corrections immediately. Misaligned or inadequately capped seams, punctures or other damage shall be repaired by patching and sealing with membrane manufacturer's directions.

.7 Adhere transition membrane to sheathing membrane at wall openings and flash into pckets of fenestration, louvers and doors as detailed, taking extra care to ensure continuity of the air/vapour barrier.

.8 Membrane shall be continuously supported.

.9 Extend all membrane patches a minimum 150 mm from repair location or penetration. Seal all around patch with mastic.

.10 Seal all side laps without factory bitumen edge and all top laps with mastic.

.11 Mechanically attach membrane to door and window frames and use additional reinforcing membrane at such locations in accordance with manufacturer's directions.

.12 Fill all joints or gaps wider than 6 mm with foam backer rod and apply 300 mm piece of membrane over joints prior to application of the field membrane.

.13 Coordinate installation of membrane with other interfacing Sections to minimize exposure of membrane.

.14 When self-adhering membrane interfaces with incompatible membranes, ensure that bond is made only to bridge membranes.

3.5 Liquid-Applied Flashing Membrane Application

.1 At penetrations to all self-adhered wall sheathing and transition membranes: Apply liquid-applied flashing system onto foil-faced self-adhered membrane in strict accordance with manufacturer's printed instructions by brush, roller or towel between ambient temperatures of +1°C and 30°C.

3.6 Adjust and Clean

.1 Repair, remove and clean all smears on exposed finished surfaces or surfaces to be subsequently finished. Clean off immediately as directed by and to the satisfaction of the Departmental Representative.

.2 Protect all adjacent surfaces from damage due to self-adhered membrane operations.

.3 As work proceeds and on completion, clean up and remove from the premises all rubbish and surplus materials resulting from this work.

END OF SECTION

PART 1 GENERAL

1.1 Section includes

.1 Replace the standing seam metal roofing on the existing gambrel roof (low slope and steep slope), with two different profiles of new pre-formed and pre-finished metal standing seam roof cladding over new SBS underlayment membrane on new plywood sheathing (sheathing by Section 06 10 00). Include underlayment membranes, panel clip systems, all fixings and associated accessories including flashings, trims, closures and sealants.

.2 Similarly, replace the standing seam metal roofing on the Cupola, 2 roof dormers, and 2 small level 1 roofs on the East elevation.

.2 The roof cladding shall be designed to also carry the structural loads of a new roof seam-mounted tracked Fall Arrest System, as shown on the Roof Plan and specified in Section 07 72 26.

.3 New non-corrosive metal snow guards at selected locations where noted.

.4 Re-installation of temporarily-removed (ref. Section 02 41 00) metal rain gutter system.

1.2 Related Work

.1 Section 01 74 21 – Waste Management and Disposal
.2 Section 02 41 00 – Selective Demolition
.3 Section 06 10 00 – Rough Carpentry
.4 Section 07 21 00 – Building Insulation
.5 Section 07 21 13 – Air Barriers
.6 Section 07 72 26 – Fall Restraint System
.7 Section 07 72 33 – Roof Hatches

1.3 References

.1 Design and provide metal roof cladding system in accordance with the latest editions of the following:

.1 CSA-S136 for the design of Cold Formed Steel Structural Members.

.2 Canadian Sheet Steel Building Institute Standards 10M and 20M.

.3 Sheet Metal and Air Conditioning Contractor's National Association, Inc., "Architectural Sheet Metal Manual" (SMACNA).

.4 Roofing Contractors' Association of BC (RCABC) RoofStar® Guarantee Standards for Architectural Sheet Metal (ASM) System.

.5 Roofing Contractors' Association of BC (RCABC) Architectural Sheet Metal Construction Details

.6 Canadian Roofing Contractors' Association (CRCA) Manual.

.7 National Building Code of Canada (NBCC) 2015.

1.4 Submittals

.1 Submit manufacturer's printed product literature, specifications, data sheets and colour samples in accordance with Section 01 33 00 Submittal Procedures which shall be sealed by a professional engineer registered in Yukon territory referred to as "Speciality Engineer".

.2 Shop Drawings:

.1 Submit shop details and erection drawings in accordance with Section 01 33 00 Submittal Procedures.

.2 Shop drawings will be sealed by a Professional Engineer registered in the Yukon Territory, referred to as "Speciality Engineer".

.3 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, supports, reinforcement, details, and accessories. Also indicate type, size and placement of anchors.

.4 Letters of Assurance:

The Engineer who seals the shop drawings shall submit to the Departmental representative, with the initial shop drawing submission, as Assurance of 'Structural Design' and Commitment for 'Field Review' on HDRC Standard Form Schedule S. Written inspection reports of field review shall be submitted to the Departmental Representative promptly as field reviews are made. On completion of the installation the Engineer shall submit to the Departmental Representative an Assurance of Field Review and Schedule S.

.5 Where metal roof cladding components interface with equipment and other building elements, this section shall be responsible for obtaining all measurements of said items prior to preparation of shop drawings.

.6 Maintenance Data:

.1 Provide maintenance data for cleaning and maintenance of panel finishes for incorporation into manual specified in Section 01 78 30.

1.5 Delivery, Storage, and Handling

.1 Packing, Shipping, Handling, and Unloading:

.1 Deliver, store, handle and protect materials in accordance with Section 01 61 10 – Product Requirements.

.2 Storage and Protection:

.1 Store and protect cladding materials in strict compliance with manufacturer's recommendations.

.2 Protect from damage due to weather, excessive temperatures and scratching/denting from construction operations in accordance with CSSB1 Standards.

1.6 Quality Assurance

.1 Manufacturers/fabricators of the metal roof cladding system shall demonstrate at least

ten years experience in projects similar in scope.

.2 Installation of metal roof cladding system shall be performed by manufacturer-approved installers experienced in metal cladding installations.

1.7 Waste Management and Disposal

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

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal: paper, plastic, polystyrene, corrugated cardboard, packing material in appropriate on-site containers for recycling in accordance with Waste Management Plan.

.4 Note that certain components related to underlayment membrane and gutter liner may be hazardous and will require special handling, transportation, storage and disposal.

1.8 Design Criteria

.1 Design pre-formed roof cladding systems to provide for thermal movement of component materials caused by ambient temperature range of 70°C without casing buckling, failure of seals, leakage and undue stress on fasteners or other detrimental effects.

.2 Ensure air tightness of roof system is continuous, is sealed at openings and terminations and is overlapped at changes in wall structure and where roof and wall meet.

.3 Cladding systems shall meet the following criteria:

.1 Air infiltration: to ASTM E283 no air leakage at 2.86 lbs/sf.

.2 Water penetration: no leakage at 20 lbs/sf when tested to ASTM E331.

.4 Design members to withstand dead load, live loads from foot traffic, roof snow load as indicated and positive and negative wind loads for locality, in accordance with NBC 2015. Maximum allowable deflection is 1/180th of span. Design members to accommodate building movement, local temperature extremes and weather tightness.

.5 Make allowance for wind up-lift load and provide extra fastening where required.

.6 Include loads resulting from the attached Fall Restraint System (per Section 07 72 26) and Snow Guards (per 2.5.3 below)

1.9 Compatibility

.1 Compatibility between components of cladding system is essential. Provide written declaration to the Departmental Representative stating that materials and components, as assembled in system, meet this requirement.

1.10 Coordination

.1 This section's "Speciality Engineer" shall coordinate the design, shop drawings and execution of the Metal Roof Cladding to support the Snow Guards and the tracked, roof seam-mounted Fall Arrest System, per Roof Plan and Section 07 72 26;

.2 This section's "Speciality Engineer" shall coordinate the design and execution of the

reinstallation of the Metal Rain Gutters;

.2 Coordinate also with Section 07 72 33 - Roof Hatches.

1.11 Job Conditions

.1 Conform to the ambient air temperature and humidity requirements and limitations as set forth by the membrane system manufacturer, the RCABC and the Roofing Inspection Agency for installation of all systems and materials.

.2 Minimum installation air temperature for solvent-based adhesives and compounds is minus 5 degree C.

.3 Protect roof decks from damage due to roofing or sheet metal operations. Protect work of other trades from damage; replace and/or make good any and all such damages caused by work of this section.

.4 Protect all adjacent surfaces and work during roofing from damage, with special protection adjacent to hoist.

.5 Inspect surfaces to receive work of this section and report any defects in writing to the Departmental Representative.

.6 Commencement of work will imply acceptance an approval of such surfaces and no claim for defects in workmanship will subsequently be allowed.

.7 Provide all temporary tarps and structures, at no additional cost to the Departmental Representative, required to protect building and roofing from weather conditions, which may cause a delay in meeting project schedules.

1.12 Inspections and Warranties

.1 The Contractor shall provide a written 3-year extended Warranty on the full roof assemblies, and shall repair at no cost to the owner any infiltration or defects observed in that period.

.2 The Contractor shall obtain from the manufacturer of metal roof cladding panels, flashings and related components a written warranty stating that its products are free of manufacturing defects. If infiltration happens due to faulty material within 10 years after installation, the manufacturer will make the necessary repairs at their expense.

.3 Independent Roof Installation Inspection Program

.1 A Roof Installation Inspection Program shall be performed by an independent inspection agency nominated by the Contractor, and approved by the Departmental Representative. Costs for the Roof Installation Inspection Program shall be borne by the Contractor.

.2 The Roof Inspector shall inspect on site the Mock-ups or Sample Installations of typical roof assembly conditions and transitions, and recommend corrective action if needed, to the satisfaction of the Departmental Representative.

.3 The Roof Inspector shall inspect the work in progress, and upon completion, to ensure that the complete system is installed in full compliance with the design, specifications, RCABC standards and details.

.4 The Roof Inspector shall inspect and recommend approval of the completed installation of underlying membranes, eaves protections and underlayments (SBS) including transitions, for complete impermeable secondary roof systems. The Contractor shall obtain approval from the Departmental Representative before undertaking the installation of the metal roof components

.4 The Roof Inspector shall provide to the Contractor and the Departmental Representative regular written reports that record the progress of the work,

errors, discrepancies or variances in installations, and recommendations for correction. Roof Inspection Reports shall be provided at critical installations, and at regular intervals during the course of roof work (not less than once a week)

.5 The Contractor shall cooperate with appointed inspection agency, follow corrective instructions and provide material samples when requested and provide access to the work in progress.

1.12 Mock-Ups / Sample Installations

.1 Provide Mock-ups or Sample Installations of critical roof assemblies, details and transitions prior to undertaking the corresponding work. Correct any errors noted by the Roof Inspector, and to the satisfaction of the Departmental Representative, before starting installation of the corresponding assemblies and/or details.

.2 Mock-up will be used to judge workmanship, substrate preparation, and material application.

.3 Mock-ups or Sample Installations shall include:

.1 Typical R1 eaves (details 5 & 7 of A2.620)

.2 Typical R1 to R2 transitions (details 4 & 6 of A2.620)

.4 Allow sufficient time for inspection of mock up by the Departmental Representative and/or Consultants, before proceeding with the balance of the work.

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

.6 Gutters: provide a sample of the replacement ferules and re-attachment hardware, for review and acceptance by the departmental Representative.

PART 2 PRODUCTS

2.1 Roof Cladding and Flashing Sheet Material

.1 Zinc coated steel sheet to ASTM A653 (hot-dip process), commercial quality, with Z275 (G90) coating, regular spangle surface, chemically treated (passivated) for unpainted finish;

.2 Roof panels base metal shall be min. 26-gauge, as designed by the Specialty Engineer.

.3 Flashing and trim shall be fabricated from the same materials and finish as the respective roof cladding.

2.2 Roof Cladding “R1” and “R3” Profile (Steep Slope, approx. 7:12)

.1 Factory-finish metal, pre-formed, min. 26-gauge, concealed-fixing, double standing seam roof cladding system for use over single layer of 40 mil S.B.S. underlayment on plywood substrate.

.2 Cladding profile shall match the existing “Heritage” roofing, with 25mm high double standing seams at nominal 705mm o.c.

.3 Provide all concealed fixing, drag load protection, clips, etc. for a complete system. Panels shall be installed in continuous lengths (no end laps).

.4 Secure standing seam roofing panels to roof structure as prescribed to meet design loads, the Speciality Engineer’s shop drawings and manufacturer’s recommendations. Employ extension members where required.

.5 Provide all matching trim, closures, flashings, sealants, valleys and reinforcing as required to produce a complete weathertight installation.

2.3 Roof Cladding "R2" profile (Low Slope, approx. 1:12)

.1 Factory finish metal, preformed, min. 26-gauge concealed fixing, double standing seam roof cladding system for application over single layer of 3mm S.B.S. underlayment on plywood sheathing.

.2 Cladding profile shall be similar to the existing "Heritage" roofing with 50mm high double standing seams at nom. 705mm o.c.

.3 Provide all concealed fixing, drag load protection, clips, etc. for a complete system. Panels shall be installed in continuous lengths (no end laps).

.5 Secure standing seam roofing panels to roof structure as prescribed to meet design loads, the Speciality Engineer's shop drawings and manufacturer's recommendations. Employ extension members where required.

.6 Provide all matching trim, closures, flashings, sealants, valleys and reinforcing as required to produce a complete weathertight installation.

2.4 Metal Flashings and Trim

.1 Form flashings associated with metal roof cladding from same material thickness and finish as roof panels. Form to profiles as detailed and required at roof edge eave, gable edge, profile closures, collar flashings at roof penetrations and trim.

.2 Form pieces in 2400 mm maximum lengths. Make allowance for expansion at joints.

.3 Hem exposed edges on underside 13 mm, provide clip fasteners spaced at 600 mm o.c. Mitre and seal corners with sealant. Make allowance for expansion at joints. Use either S- lock seams at joints and seal with sealant or fasten through 13 mm slotted holes using fasteners with washers to conceal holes, space fasteners at maximum 600 mm. At mitered corners use standing seams. All fasteners in roof systems flashing concealed from view except as approved otherwise.

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

.5 Apply isolation coating to metal surfaces in contact with pressure treated wood and dissimilar bare metals.

.6 Provide all fabrication and proprietary flashings of size to accommodate roof penetrations.
Pre-finish where exposed in final assembly and described as follows:

.1 Pipe and stack flashing: flexible neoprene or EPDM flashing, adjustable hole size, resistant to ozone and UV, with collar clamp and integral fastening ring at base of 1 mm thick aluminum alloy A1100-0 or stainless steel, and stainless steel screws.

2.5 Accessories

.1 Fasteners: self-tapping screws to CSA B35.3, purpose made, galvanized finish and stainless steel fasteners as indicated:

- .1 Exposed fasteners: Equal to "Climaseal" with colour matching heads where exposed to view.
- .2 Concealed fasteners: stainless steel.

.2 Sealants:

- .1 Seam sealant in roof panels at overlapping joint: factory-applied to manufacturer's standard to meet design criteria. Refer to Section 07 90 00.
- .2 Exposed sealant: as recommended by manufacturer.
- .3 Tape: butyl tape to manufacturer's standard, to meet design criteria.

.3 Snow Guards

- .1 Metal clip type snow guards for extent shown on the roof plans, min. 14 gauge folded and shaped metal. Prefinished, powder coat to match roof cladding.
- .2 Use colour-matched screw heads. Number and spacing pattern of Snow Guards according to supplier's recommendations.
- .3 Fasten to roof as per Speciality Engineer's design. Provide stamped shop drawings indicating layout pattern and fastening details.
- .4 An example of acceptable product: Rocky Guard RGS Snow Guard. Other products having equivalent characteristics will not be excluded.

.4 Perforated Linear Metal Soffit Vent

- .1 Nom. 50mm wide metal hat-shaped, perforated to 50% opening, prefinished white.

2.6 Fabrication

.1 Fabricate roof components to comply with dimensions, profiles, gauges and details as shown on the shop drawings, including fascia and valley panels and all companion flashing.

.2 Fabricate all components of the system in the factory, ready for field installation.

.3 Provide roof sheet and all accessories in longest practicable length to minimize field lapping of joints.

2.7 Roof Membrane

.1 Self-adhesive membrane composed of woven polyethylene and SBS modified bitumen for application over plywood sheathing.

.2 Apply underlayment using primer as recommended by manufacturer.

.3 The underlayment membrane shall conform to the following properties

Properties	Test Standards	Value
Thickness	-	40 mil
Dimension	-	75 ft x 36 in
Roll Weight	-	44 lb
Under face	-	"Split-Back" Silicone release film
Breaking Strength, MD/XD	ASTM D1970	64 / 88 lb/in
Elongation at Break, MD/XD	ASTM D1970	52 / 24%
Tear Resistance	ASTM D1970	84 / 90lb
Static puncture	ASTM D5602	90 lb
Adhesion to Plywood, 4.5°C	ASTM D1970	12 lbf/ft
Adhesion to Plywood, 24°C	ASTM D1970	39.4 lbf/ft
Low temperature flexibility	ASTM D1970	Pass at -30°C
Water Vapour Permeance	ASTM E96	0.022 perm
Nail Sealability	ASTM D1970	Pass

.4 An example of the product is "Lastobond Shield HT" by Soprema. Other products having the same characteristics will not be excluded.

2.8 Catalyzed Resin Liquid Flashing System

.1 Multi-component, fully reinforced, flexible polymethyl methacrylate-based (PMMA) liquid flashing membrane system by same manufacturer as roofing underlayment membranes and complying with the following Table of Properties.

Property	**Test Method**	**Values**
Membrane thickness	ASTM D5147 Sec 5	2.9 mm (115 mils)
Peak load @ 23°C (73°F) avg.	ASTM D5147 Sec 6	12.3 kN/m (70 lbf/in)
Elongation @ peak load, avg.	ASTM D5147 Sec 6	42%
Peak load @ 23°C (73°F) avg.	ASTM D412 (dumbbell)	15.8 kN/m (90 lbf/in)
Elongation @ peak load, avg.	ASTM D412 (dumbbell)	55%
Shore A hardness, avg.	ASTM D2240	81
Water absorption, (Method I) (24h @ 23°C (73°F))	ASTM D570	0.41%
Water absorption, (Method II) (48h @ 50°C (122°F))	ASTM D570	1.57%
Low temperature flexibility	ASTM D5147 Sec 11	-25°C (-13°F)
Dimensional stability (max. movement)	ASTM D5147 Sec 10	-0.063%
Tear strength	ASTM D5147 Sec 7	0.5 kN (107 lbf)

.2 Liquid flashing shall be available in "summer" and "winter" grades, be supplied with companion primer for non-metallic substrates, catalyst and fleece reinforcement. Employ where noted and required.

.3 An example of the product is "Alsan RS230 System" by Soprema or equal product produced by Siplast.

2.10 Adhesive Traffic Walkway

.1 Where and as shown on drawings as rooftop walkway and protection of roof surfaces;

.2 Adhesive tape or adhesive panels, fixed to the roof cladding (not including the seams) providing a non-slip surface for safe roof access. Ensure product and adhesive is durable and suitable for the installation material, configuration and extreme temperature range;

.3 An example of the product: 3M Safety-Walk, medium-textured. Other products having equivalent characteristics will not be excluded.

2.11 Woven Drain Matt

.1 As shown and detailed: continuous woven drain matt as part of roof assemblies and flashing details.

.2 An example of acceptable product is "Enkamat" 8mm. Other products having the same characteristics will not be excluded.

2.12 Woven Mesh Roof Vent Baffle

.1 Where indicated as detailed to prohibit insects from entering the roofing assemblies at venting spaces.

.2 An example of the product is "Profile Vent". Other products having the same characteristics will not be excluded.

2.13 Standing Seam Sealant

.1 Use continuous concealed Butyl Tape (nom. 19mm wide). Ensure sealant material is suitable for the extreme temperature range, and allows for thermal movement of the roof panels. Provide product technical literature for acceptance as part of the Shop Drawing submittal. An example of an acceptable product is 3M Weatherban. Other products having equal characteristics will not be excluded;

PART 3 EXECUTION

3.1 Preparation

.1 Install metal roof cladding assembly following completion and approval of plywood sheathing and underlayment membrane.

.2 Precut panels and flashing sections in factory where practical. Torch cutting of material on site is not acceptable.

3.2 Roofing Systems Descriptions

.1 Systems "R1" & "R3" (Steep Slope, approx. 7:12)

.1 Division 02 will remove and dispose of existing metal standing seam roofing, flashings & appurtenances, and remove & retain existing wood sheathing planks;

.2 Section 06 10 00 will install retained or replacement wood sheathing & new plywood sheathing.

.3 This Section shall install 8mm Woven Drain Matt and single layer of new 40 mil S.B.S. underlayment over plywood sheathing.

.4 This Section shall install new standing seam metal roofing R1 or R3 system, per part 2.2 above. All double standing seams shall be pre-caulked, with continuous concealed sealant.

.2 System "R2" (Low Slope, approx. 1:12)

.1 Division 02 will remove and dispose of existing metal standing seam roofing, flashings & appurtenances, and remove & retain existing wood sheathing planks;

.2 Section 06 10 00 will install retained or replacement wood sheathing & new plywood sheathing.

.3 This Section shall apply liberal amounts of liquid flashing at all substrate bends, steps, vergers and where indicated and required.

.4 This Section shall install 8mm Woven Drain Matt and a single layer of new 3mm thick selvedge S.B.S. underlayment membrane over plywood sheathing.

.5 This Section shall place cladding anchorage clips over liberal amounts of liquid flashing/ mastic;

.6 This Section shall install new standing seam metal roofing R2 system, per part 2.3 above. All double standing seams shall be pre-caulked, with continuous concealed sealant.

3.3 Installation General

.1 Install roof systems in accordance with approved shop drawings, RCABC standards, manufacturer's instructions and Roofing Inspector's directives.

.2 Over new plywood sheathing, install self-adhesive underlayment fully adhered to properly primed solid substrate according to manufacturer's recommendations. Ensure all joints are properly lapped and sealed. Tie in with barriers on adjacent surfaces to ensure weathertight construction. Provide a continuous seal around all openings in the metal roof system.

.3 Precut panels and flashing sections in the shop where practical. Torch cutting of material on site is not acceptable.

.4 Install exterior prefinished roof panels on plywood sheathing, using manufacturer's proper construction procedure. Ensure metal roofing sheet side-lap is positively retained and proper sheet coverage is maintained. Add sealant as indicated and where required.

.5 Install metal roof cladding with standing seams spaced at nom. 705mm o.c. to match spacing of existing "heritage" roofing, commencing said layout as indicated on the drawings.

.6 Standing seams of all roofing types shall align with each other;

.7 Install pre-finished sheet metal roof collars and flashings for all roof penetrations in accordance with approved shop drawings and manufacturer's instructions.

.8 Commence with installation of panels where indicated on drawings and arrange panels symmetrically so that roof penetrations will not intersect ribs and that spacing is equal from end walls. Break form end panels to form flashing at end walls as indicated on shop drawings.

.9 Counter flash roof panels at roof/wall juncture. Install all vent flashing, vents, counter flashing and special assemblies in accordance with approved shop drawings, manufacturer's written instructions, for RCABC standards and inspector's directive.

3.4 Re-Installation of Metal Gutters

.1 Re-install the pre-existing temporarily-removed metal gutters in the their original configuration and slopes, and using the existing attachment hardware penetrations.

.2 Replace any damaged 70mm galvanized ferules as needed.

.3 Use attachment hardware as specified by the Specialty Engineer. Re-use existing attachment penetrations in gutter sections.

.4 Re-connect the gutters to the retained downpipes with the horizontal diverter sections.

.5 Ensure the continuous re-installed gutter is complete, leakproof and fully draining. Use appropriate caulking or sealants as required for a complete functional system.

3.5 Clean-Up

.1 Clean exposed panel surfaces in accordance with manufacturer's instructions.

.2 Repair and touch up with colour matching high grade enamel minor surface damage, only where permitted by the Departmental Representative and only where appearance after touch-up is acceptable to Departmental Representative.

.3 Replace damaged panels and components that, in opinion of the Departmental Representative, cannot be satisfactorily repaired.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 The design, fabrication, supply and installation of a complete roof-top Fall Restraint System, for exterior building maintenance and security.

1.2 RELATED SECTIONS

.1 07 41 00 - Metal Roof Cladding

.2 07 90 00 - Joint Sealants

1.3 REFERENCES

.1 Industrial Health and Safety Regulations, Workers Compensation Board of Yukon Territory.

.2 CSA Z91-02, "Health and Safety Code for Suspended Equipment Operations"

.3 National Building Code of Canada (NBCC), 2015

.4 CSA Z259.16-15 - Design of Active Fall Protection Systems

1.4 DESIGN REQUIREMENTS

.1 A Fall Restraint System shall be capable of resisting without fracture or pull out a force of 5,000 lbs. applied in any direction.

.2 Provide a complete and fully engineered system of supports including rails, clamps, connectors, trolleys, stops and accessories.

.3 The design, fabrication and installation of the Fall Restraint System shall be prepared by a structural engineer registered in Yukon Territory experienced in this type of work.

.4 Engineer and design a Fall Restraint System in accordance with the Industrial Health and Safety Regulations, Yukon Workers' Compensation Health and Safety Board (YWCHSB) and CSA Z91. In the case of conflicts between the documents, the Industrial Health and Safety Regulations, WCB of Yukon will take precedence.

.5 Be responsible to advise other trades of any additional structural requirements required for the installation and proper performance of the Fall Restraint System. The Contractor is responsible to ensure that all affected trades include the cost of modifications to construction to permit the installation of the Fall Restraint System, no additional costs will be considered by the Departmental Representative for failure to do so.

1.5 SUBMITTALS

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

.2 Shop drawings shall be prepared and sealed by a professional structural engineer registered in Yukon Territory.

.3 Clearly indicate design, drops, fabrication details, plans, elevations, hardware and installation details. Show interface with existing metal roof.

.4 Include all necessary “Restrictive and Non-Restrictive” working usage notes and general safety notes.

.5 Include a letter of compliance from a structural engineer certifying that the anchor meets the performance requirements of CSA Z91.

.6 Submit test data certifying strength of connections.

.7 Submit a safety inspection log book for the Departmental Representative’s use for yearly inspections.

.8 Submit electronic copies of shop drawings showing Fall Restraint System and details to the Departmental Representative to post near roof entrances.

.9 Upon completion of the work submit to the Departmental Representative a plastic laminate copy of all shop/installation drawings for the work.

.10 As-Built Drawings: A copy of as-built drawings of roof plan showing layout of Fall Restraint System shall also be included in the systems manual.

.11 Warranty: Submit manufacturer warranty and ensure that forms have been completed in Departmental Representative's name and registered with manufacturer.

1.6 LETTERS OF ASSURANCE

.1 The Engineer who seals the shop drawings (Specialty Engineer) shall submit to the Departmental Representative with the initial shop drawings submission, an Yukon Territory Letter of Assurance Schedule B: Assurance of Professional Design and Commitment for Field Review, and Model Schedule C: Assurance of Professional Field Review and Compliance by supporting registered professional.

1.7 QUALIFICATIONS

.1 Manufacturer: A company specializing in the design, fabrication and installation of Fall Restraint System and having experience in projects of similar design and complexity. Manufacturer and installer shall provide a minimum of $2,000,000.00 liability insurance in the joint names of the Contractor, Subcontractor, and the Specialty Engineer. Liability insurance shall be maintained for a period of six years from the date of Substantial Performance of the Work. Provide qualification and insurance documentation to the Departmental Representative when requested.

.2 Companies engaged in welding shall be certified by the Canadian Welding Bureau to CSA W47.1 and CSA W47.2. Welders to be qualified for the base material and procedures to be executed.

.3 Submit proof of certification to the Departmental Representative if requested.

PART 2 PRODUCTS

2.1 ROOF FALL RESTRAINT SYSTEM

.1 A complete rigid monorail track system, attached to the existing metal roof standing seams, including travelling trolleys, clamps and connectors, stops and accessories, to allow for maintenance and repair access to the full extent of the main courthouse roof. Refer to Roof Plans, Elevations and relevant details for the existing roof configuration. The Fall Restraint System shown in the drawings is an illustrative concept only, for guidance.

.2 The Fall Restraint rail shall be low-profile anodized aluminum product, capable of spanning the typical 705mm-wide roof panels, and attaching to 25mm or 50mm double-lock standing seams.

.3 The Fall Restraint System shall be compatible with the Heritage character-defining metal roof, and shall use a minimal intervention approach to installation, number of components, and visual complexity. Components of the Fall Restraint System shall not detract from the Heritage appearance of the building. The selection of the Fall Restraint System product will require approval of the Departmental Representative, following advise from Heritage Conservation Services.

.4 Acceptable Product: RoofSafe Rail System (Capital Safety)- Atlas Anchors Systems: (403) 210-3699.

Other products having the same characteristics shall not be excluded.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Inspect the work of other sections upon which the work of this section depends.

.2 Report any defects in writing to the Departmental Representative prior to starting work. Commencement of work shall imply acceptance of building conditions for installation.

3.2 INSTALLATION

.1 Install Fall Restraint System in accordance with reviewed shop drawings.

.2 Supply templates, rough-in dimensions, anchorage information and instructions to others as required for building in of work supplied by this section.

.3 Install work to meet manufacturer's printed installation instructions, true, tightly fitted, level and flush to adjacent surfaces.

.4 Isolate dissimilar materials to prevent electrolysis.

3.3 FIELD QUALITY CONTROL

.1 Test the system to 5000 lb. pull out strength and submit test results to the Departmental Representative.

.2 The Fall Restraint System Specialty Engineer responsible for preparation of shop drawings shall perform regular field reviews during construction and submit field reports to the Departmental Representative to certify that the work has been installed according to the shop drawings.

END OF SECTION

PART 1 GENERAL

1.1 Related Work

.1	Section 07 41 00	Metal Roof Cladding
.2	Section 07 90 00	Sealants

1.2 Shop Drawings

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

.2 Indicate size and description of components, materials, attachment devices, description of frame and finish, and construction details.

PART 2 PRODUCTS

2.1 Materials

.1 Aluminum sheet: mill finish plain pattern utility sheet.

.2 Aluminum: extruded sections of AA6063-T5 alloy, all components one piece without splices.

.3 Gaskets: extruded resilient neoprene, with full recovery after 50% compression.

.4 Insulation: fibrous glass, to CSA A101, Type IA, 75mm thick.

.5 Fasteners: adequately secure curb to roof deck.

.6 Sealants: in accordance with Section 07 90 00, clear colour selected by Departmental Representative.

.7 Isolation coating: alkali resistant bituminous paint or epoxy solution.

2.2 Components

.1 Hatch assembly shall be thermally broken, and provide a means (e.g. flange or other) of continuously tying-in the surrounding roof Sheathing Membrane to the body of the hatch, so as to provide a weather-proof seal all around.

.2 Hatch lid, single lead:

.1 Dimensions to suit 914x914mm hatch size, per drawings.

.2 Cover of 3mm sheet aluminum with 75mm beaded flange at perimeter.

.3 Liner of 0.8 sheet aluminum.

.4 Resilient gasket/seal to inner face of lid in contact with hatch lid support frame.

.5 Hatch assembly shall be thermally broken.

.3 Hatch lid support frame: 3mm sheet aluminum.

.4 Curb:

.1 Frame 200 mm high, of 3mm sheet aluminum with 89mm flange for support to deck and integral cap flashings.

.2 Outer surface cladding: 1mm sheet aluminum outer liner.

.4 Screws: to CSA B35.2.1963 (R1969) stainless steel for curb to structure.

.5 Hinges: type recommended by roof hatch manufacturer.

.6 Latch: positive snap with turn handles inside and out and padlock hasps inside and outside.

.7 Securing latch: hold open operating arm with vinyl grip handle to permit one handed release.

.8 Feature to prevent from being locked out on roof.

.9 Fixed metal ladder, prefinished. Fasten to adjacent framed wall. Extend to attic floor. Provide blocking in wall to suit attachments.

.10 Fall Arrest Tie-off: metal, to suit clip-on safety line, according to WorkSafe standards.

2.3 Fabrication

.1 Fabricate components free of twists, bends or visual distortion and properly insulated. Weld corners and joints.

.2 Assemble roof hatch components as indicated.

.3 Ensure continuity of weather-tight seal.

.4 Design flashings to collect and lead off condensation accumulated.

2.4 Sample Product

.1 An example of the specified Roof Hatch is:
Bilco S-50-TB, insulated and thermally broken aluminum. Other products having the same characteristics will not be excluded.

PART 3 EXECUTION

3.1 Installation

.1 Install roof hatch in new steel standing seam roof, as detailed. Ensure weather tight transitions to existing roof cladding.

.2 Install roof hatches plumb, level and in proper alignment as indicated.

.3 Adjust and seal assembly with provision for expansion and contraction of components.

.4 Secure prefabricated curb assembly to structure where indicated.

.5 Coat aluminum in contact with dissimilar materials, with isolation coating.

.6 Ensure integral installation with roof membrane.

END OF SECTION

PART 1 GENERAL

1.1 Summary

.1 This section specifies standards for caulking and sealants applied by this and other sections.

.2 Refer to other sections for additional caulking and sealants.

1.2 Reference Standards

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

.2 CGSB 19-GP-14M-76 Sealing Compound, One Component, Butyl-polyisobutylene Polymer Base, Solvent curing.

.3 CAN/CGSB-19.17-M90 One-Component Acrylic Emulsion Base Sealing Compound.

.4 CAN/CGSB-19.21-M87 Sealing and Bedding Compound Acoustical.

.5 CAN/CGSB-19.22-M90 Mildew Resistant, Sealing Compound for Tubs and Tiles.

.6 CAN/CGSB-19.24-M90 Multi-component, Chemical Curing Sealing Compound.

1.3 Environmental and Safety Requirements

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labeling and provision of material safety data sheets acceptable to Labour Canada.

.2 Comply with requirements specified in the following sections:

.1 Section 01 35 43 – Environmental Procedures

.2 Section 01 74 21 – Waste Management and Disposal

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

.4 Sealant and substrate materials to be minimum 5o C.

.5 Should it become necessary to apply sealants below 5o C, consult sealant manufacturer and follow their recommendations.

1.4 Waste Management and Disposal

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Sealant Materials

.1 Sealants acceptable for use on this Project must be listed on CGSB Qualified Products List issued by CGSB Qualification Board for Joint Sealants. Where sealants are qualified with primers use only these primers.

2.2 Sealant Material Designations

.1 Urethanes One Part.

.1 Self-Levelling to CAN/CGSB-19.13, Type 1, colour as selected.

.2 Urethane one Part.

.1 Non-Sag to CAN/CGSB-19.13, Type 2, MCG-2-40, colour as selected.

.3 Silicones One Part.

.1 To CAN/CGSB-19.13.

.2 To CAN/CGSB-9.22 (Mildew resistant).

.4 Silicone Strip Sealant

.1 Preformed low-modulus silicone extrusion, width to suit application, c/w primer/sealer as indicated by manufacturer for designed substrate and use. Standard colour selection by the Departmental Representative.

.5 Acoustical Sealant

.1 To CAN/CGSB-19.21

.6 Butyl.

.1 To CGSB 19-GP-14M

.7 Acrylic Latex One Part.

.1 To CGSB 19-17.

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

.1 Polyethylene, Urethane, Neoprene or Vinyl Foam.

.1 Extruded closed cell foam backer rod.

.2 Size: oversize 40 to 50%.

.2 Neoprene or Butyl Rubber.

.1 Round solid of Shore A hardness 70.

.3 High Density Foam.

.1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m3 density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond Breaker Tape.

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

2.3 Sealant Selection

.1 Perimeters of exterior openings where frames meet exterior façade of building: Sealant type: one component urethane, non-sag.

.2 Coping joints and coping-to-façade joints & flashing joints: Sealant type: butyl.

.3 Colour of sealants: selected by Departmental Representative from manufacturer's standard range to match adjacent surfaces.

.4 Joint cleaner: xylol, methylethyleketon or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

2.4 Joint Cleaner

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

.2 Primer: as recommended by manufacturer.

PART 3 EXECUTION

3.1 Preparation of Joint Surfaces

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

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

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

.4 Ensure joint surfaces are dry and frost free.

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

3.2 Priming

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

3.3 Back Up Material

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

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

3.4 Mixing

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

3.5 Application

.1 Sealant.

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

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

.2 Apply sealant in continuous beads.

.3 Apply sealant using gun with proper size nozzle.

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

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

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

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

.8 Curing.

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

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

.9 Cleanup.

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

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

.3 Remove masking tape after initial set of sealant.

END OF SECTION

PART 1 GENERAL

1.1 Work Included

1. This section of work shall include all labour, materials, tools, scaffolds and other equipment, services and supervision required to prepare surfaces and to cover them with paint and/or transparent finish as herein specified and as shown on the "Finish Schedule", to the full intent of the specifications.

1.2 Work Excluded

1. All factory and pre-finished items not scheduled and specified for painting.
2. Shop-finished millwork and other components shall conform to these specifications.

1.3 Related Sections

.1 Section 05 50 00 - Metal Fabrications

.2 Section 06 03 00 – Conservation Treatment For Period Finish Carpentry

1.4 References

.1 The Master Painters Institute (MPI) Maintenance Repainting and Architectural Painting Specification Manuals, current edition.

.2 Shop-finished millwork shall conform to these specifications.

1.5 Submittals

.1 All submittals shall be in accordance with Section 01 33 00 – Submittal Procedures.

.3 If requested by the Departmental Representative, provide for approval a 300 x 300 mm sample of each colour on the actual base material. Colours shall be exact shade, texture and gloss value.

.4 All colours shall be as selected by Departmental Representative.

1.6 Quality Assurance

.1 The paint products of the Paint Manufacturer shall be as listed in the MPI Maintenance Repainting and Architectural Painting Specification Manuals (latest edition), under "Paint Product Recommendation" section, or approved equivalent.

.2 This contractor shall have a minimum of five (5) years proven satisfactory experience, and shall maintain a qualified crew of painters throughout duration of the work who shall be qualified to fully satisfy the requirements of this specification. Only qualified journeymen (and apprentices) shall be engaged in painting and decorating work who have a provincial Tradesman Qualification certificate of proficiency.

.3 This work section requires full cooperation at all times with the MPDA (MPI) in the performance of its duties.

1.8 Product Handling

.1 Paint materials shall be delivered to the job site in sealed original labeled containers bearing manufacturer's name, type of paint, brand name, designation and instruction for mixing and/or reducing.

.2 The Contractor shall provide adequate storage facilities. Paint materials shall be stored at a minimum ambient temperature of 7°C in a well ventilated and heated single designated area.

.3 Take all necessary precautionary measures to prevent fire hazards and spontaneous combustion.

.4 Where toxic materials and both toxic and flammable solvents are used, appropriate precautions shall be taken and no smoking allowed as a regular procedure.

1.9 Environmental Conditions

.1 Temperature, humidity and moisture content shall conform to the following:

Temperature:	No painting shall be performed when temperature on the surfaces, or the air in the vicinity of the painting work are below 5°C (41°F) for interior work and 10°C (50°F) for exterior work.
Relative Humidity:	Shall not be higher than 85%.
Moisture of Surfaces:	Tests shall be done by electronic "Moisture Metre".
Plaster and Wallboard:	Maximum moisture content 12%.
Masonry/Concrete:	Maximum moisture content 12% for solvent type paint. Masonry surfaces may be tested for alkalinity.
Wood:	Maximum moisture content 12%.

.2 Proper lighting shall be the Contractor's responsibility.

.3 All areas where painting and coatting work is proceeding require adequate continuous ventilation and sufficient heating facilities to maintain temperatures above 7°C (45°F) for 24 hours before and after paint application. Required heat and ventilation shall be provided by the Contractor.

1.10 Protection

.1 Adequately protect other surfaces from paint. Any damage will require specialist advice and Departmental Representative approval, in terms of repair methods and materials. This section will not be responsible for any damage caused by others.

.2 Furnish sufficient drop cloths, shields and protective equipment to prevent spray of dropping from fouling surfaces not being painted and in particular, surfaces within the storage and preparation area.

.3 Cotton waste, cloths and material, which may constitute a fire hazard, shall be placed in closed metal containers and removed daily from the site.

.4 Remove all surface hardware, electrical plates, fittings, fastenings, etc. prior to painting operation. These items shall be carefully stored, cleaned and replaced on completion of work in each area.

1.11 Scheduling

.1 Schedule painting operations to prevent disruption of and by other trades.

PART 2 Products

2.1 Materials

.1 Paint, varnish, stain, enamel, lacquer, and fillers used shall be of a type and brand herein specified and listed under "Paint Product Recommendations" as covered in the MPI Architectural Painting Specification Manuals, latest edition, for specific purposes.

.2 Paint materials such as linseed oil, shellac, turpentine, etc. and any of the above materials not specifically mentioned herein but required for first class work with the finish specified shall be of the highest quality product of an approved manufacturer. All coating material shall be compatible.

.3 All materials shall be lead, hex. chromium, cadmium and mercury free and shall have low VOC content.

.4 Preference to be given to ISO 2002 registered manufacturers.

.5 Only qualified products with E2 "Environmentally Friendly" rating are acceptable for use on this project. Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels. Use MPI listed materials having minimum rating where indoor air quality (odour) requirements exist.

.6 All material shall be premium Architectural grade unless otherwise specified.

.7 Where required, paints and coatings shall meet the flame spread requirements of local authorities having jurisdiction.

2.2 Gloss

.1 Paint gloss is defined as the sheen rating of applied paint, in accordance with the following values:

.1 Gloss Level 1: Flat or matt: max. 5 units @ 60 degrees to a maximum of 10 units @ 85 degrees.

.2 Gloss Level 2: High Sheen Flat (Velvet-like): max. 10 units @ 60 degrees to a maximum of 10 – 35 units @ 85 degrees.

.3 Gloss Level 3: Eggshell: max. 10 – 25 units @ 60 degrees to a maximum of 10 – 35 units @ 85 degrees.

.4 Gloss Level 4: Satin-like Finish: max. 20 – 35 units @ 60 degrees to a minimum of 35 units @ 85 degrees.

.5 Gloss Level 5: Semi-gloss Finish: max. 35 – 70 units @ 60 degrees.

.6 Gloss Level 6: Gloss Finish: max. 70 – 85 units @ 60 degrees.

.7 Gloss Level 7: High Gloss Finish: more than 85 units @ 60 degrees.

PART 3 Execution

3.1 General

.1 Method of paint application shall be generally by the accepted trade method. Painting coats specified are intended to cover surfaces satisfactorily when applied in strict accordance with recommendations.

.2 Apply each coat at the proper consistency. Each coat of paint shall be slightly darker than preceding coat unless otherwise approved.

.3 Sand lightly between coats to achieve the required finish. Each coat of finish to be dry and hard before a following coat is applied unless the manufacturer's directions state otherwise (4 hours for latex; 8 hours for alkyd).

.4 Tint filler to match wood when clear finished are specified; work filler well into the grain and before it has set wipe the excess from the surface.

.5 Application of paint shall be in strict accordance with MPI Architectural Painting Specification Manual requirements.

.6 Complete hiding is required on all finishes, including deep tone colours.

.7 Contractor shall employ sufficient tradesmen to carry out the job with no interruption, slow down or inconvenience to the project schedule and operations.

3.2 Condition of the Surfaces

.1 Prior to commencement of work of this section, thoroughly examine all surfaces scheduled to be painted.

.2 Report to Departmental Representative any condition adversely affecting this work.

.3 No painting work shall proceed until all defects have been corrected and surfaces are acceptable for painting.

.4 Commencement of work shall be held to imply acceptance of surfaces.

.5 All preparation work shall be the responsibility of this section. (Refer to Surface Preparation).

3.3 Preparation of Surfaces

.1 Prior to commencement of work of this section, thoroughly examine all surfaces scheduled to be painted. Report to Departmental Representative any conditions adversely affecting this work.

.2 No painting work shall proceed until all defects have been corrected and surfaces are acceptable for painting. All preparation work shall be the responsibility of this Section.

.3 Prepare all surfaces in accordance with the requirements in Chapter 3 of the MPI Maintenance Repainting and Architectural Painting Specification Manuals (latest edition) and as herein specified.

.4 Remove and securely store all miscellaneous surface fittings/fastenings (eg: electrical places and frame stops), removable rating/hazard/instruction labels, prior to painting and replace upon completion. Carefully clean and replace all such items upon completion of repainting work in each area. Do not use solvent or reactive cleaning agents on items that will mar or remove finishes (eg: lacquer finishes).

.5 All surfaces shall be sanded prior to the application of any coatings.

.6 Allow full drying between coats, as per manufacturer's recommendations. Sand in between coats.

.7 Repair all water damaged surfaces and spot prime with a stain blocking primer.

.8 Surface defects, such as nail/screw popping, paper tears, nicks and scratches, line gauges caused by chair back seat rests, tables, etc., shall be filled, sanded and spot primed with an approved primer and shall be considered normal surface preparation.

.9 Units severely contaminated with grease, smoke and tar – hand wash with detergent and rinse thoroughly prior to any surface preparation.

.10 All surfaces: applications shall be by brush/roller, including smooth ceilings.

.11 Allow full drying between coats, as per manufacturer's recommendations. Sand in between coats.

.12 Surface defects such as old paint runs on walls and wood works must be sanded smooth prior to the applications of any coating(s).

.13 Tape fill, sand and spot prime all minor cracks.

.14 Remove clear tape from walls, ceilings, doors, etc. Remove felt pen graffiti from doors, walls, etc. before priming.

.15 Ensure that a transition primer is applied over alkyd surfaces where waterborne systems have been specified.

3.4 Field Quality Control

.1 Undertake work in strict accordance with the Master Painters Institute (MPI) Architectural Painting Specifications Manual, and the MPI Maintenance Repainting Manual, latest editions.

3.5 Painting Schedule

.1 The following titles, grades and code numbers refer to those listed in the Master Painters Institute (MPI) Architectural Painting Specifications Manual, and the MPI Maintenance Repainting Manual, latest editions.

.1 Basement Structure

.1 Metal Fabrication (non-galvanized) - Existing

RIN 5.1B- W.B. Light Industrial Coating

.2 Metal Fabrication – New

INT 5.1B- W.B. Light Industrial Coating

.2 Dormers, Front Entry Door & Trims

.1 Exterior Wood Soffits, Cladding & Trims – Re-installation

EXT 6.3L- Latex (over latex primer)

.2 Exterior Wood Soffits, Cladding & Trims – New

EXT 6.3L- Latex (over latex primer)

.3 Fascia (while gutters temporarily removed)

.5 Exterior Wood Fascia - Existing

REX 6.3L – latex (over latex primer)

3.6 Paint Colour Schedule

.1 Metals: Use light grey (or equivalent standard colour), typical.

.2 Exterior Wood Soffits & Trims: Match colour & gloss of adjacent retained paint finish.

3.7 Adjust and Clean

.1 On completion of the work, remove all paint where spilled, splashed or splattered.

.2 During the progress of the work, keep the premises free from any unnecessary accumulation of tools, equipment, surplus materials and debris.

.3 At the conclusion of the work leave the premises neat and clean to the satisfaction of the Departmental Representative.

3.8 Field Quality Control

.1 Painting surfaces will be considered to lack uniformity and soundness if any of the following defects are apparent:

.1 Runs, sags, hiding or shadowing by inefficient application methods.

.2 Evidence of poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, corners and re-entrant angles.

.3 Damage due to touching before paint is sufficiently dry or any other contributory cause.

.4 Damage due to contamination of paint due to airborne particles.

3.9 Protection

.1 Protect all newly painted exterior surfaces from rain and snow, condensation, contamination, dust, salt spray and freezing temperatures until paint coatings are completely dry. Curing periods shall exceed the manufacturer's recommended minimum time requirements.

.2 Erect barriers or screens and post signs to warn of or limit or direct traffic away or around work area as required.

3.10 Cleaning

.1 Promptly as the work proceeds and on completion of the work, remove all paint where spilled, splashed or spattered using methods that are not detrimental to affected surfaces.

.2 Keep the premises free from any unnecessary accumulation of tools, equipment, surplus materials and debris.

.3 Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with requirements of authorities having jurisdiction.

.4 Clean equipment and dispose of wash water/solvents as well as all other cleaning and protective materials (ie. Rags, drop cloths, masking papers) paints, thinners paint removers/strippers in accordance with the safety requirements of authorities having jurisdiction.

.5 At the conclusion of the work, leave the premises neat and clean.

END OF SECTION

General

1.1 REFERENCES

.1 NBC, National Building Code of Canada.

.2 CSA C22.1, Canadian Electrical Code.

.3 Underwriters Laboratories of Canada (ULC)

1. CAN/ULC-S524, Installation of Fire Alarm Systems.
2. CAN/ULC-S525, Audible Signal Appliances for Fire Alarm.
3. CAN/ULC-S526, Visual Signal Appliances For Fire Alarm Systems.
4. CAN/ULC-S527, Control Units For Fire Alarm Systems.
5. CAN/ULC-S528, Manual Pull Stations.
6. CAN/ULC-S529, Smoke Detectors For Fire Alarm Systems.
7. CAN/ULC-S530, Fire Detectors, Heat Actuated, For Fire Alarm Systems.
8. CAN/ULC-S531, Smoke Alarms.
9. CAN/ULC-S536, Inspection and Testing of Fire Alarm Systems.
10. CAN/ULC-S537, Verification of Fire Alarm Systems.

1.2 DESCRIPTION OF SYSTEM AND SCOPE OF WORK

.1 The existing fire alarm system consists of heat detectors and manual stations for initiating devices, and horns for annunciating devices as shown in Appendix A. All existing fire alarm devices are surface mounted. All existing wiring is installed using surface mounted flexible metal jacketed fire alarm cabling. Representative photographs of typical installation conditions are attached.

.2 Optional Fire Alarm treatment methods during construction:

.1 Option 1: the contractor may choose to retain and protect the existing fire alarm installation during the work and keep the entire system operational.

.2 Option 2: the contractor may choose to partially or completely disable the fire alarm system during work.

.3 If Option 1 is selected and any devices are required to be temporarily relocated to accommodate the work, the Contractor shall ensure the fire alarm system is fully operational upon completion of the fire alarm work.

.4 Replace any devices or system components damaged during the course of the work.

.5 Regardless of the method selected, if at any point during construction the fire alarm system is partially or completely disabled, dedicated fire watch must be provided by the Contractor full time until the system functionality is fully restored. Fire watch plan to be submitted and approved by the Departmental Representative and the Dawson City Fire Chief.

.6 The Contractor shall ensure that the fire alarm system is restored and fully operational at the completion of the work. All devices removed or relocated to facilitate the work shall be re-installed in similar locations as existing.

.7 A complete fire alarm verification in accordance with CAN/ULC-S537 shall be performed upon completion of the work.

.8 The existing fire alarm panel is a Simplex 4100ES and is located in the Carriage Shed building. The existing Simplex 4602 annunciator is located in the rear vestibule of the Courthouse building. The fire alarm device loop wiring is Class A style as indicated in the attached drawings.

1.3 REQUIREMENTS OF REGULATORY AGENCIES

1. To approval and final acceptance of the Yukon Building Inspections Division

.2 System components: listed by ULC, bear the ULC label and comply with applicable provisions of National Building Code with Local and Territorial amendments, CAN/ULCS524 standard for the installation of fire alarm systems, Canadian Electrical Code C22.1; part I and meet requirements of local authority having jurisdiction.

1.4 CLOSEOUT SUBMITTALS

.1 Provide completed verification report and certification free of qualifying remarks prior to substantial completion.

Part 2 Products

2.1 MATERIALS

.1 Equipment and devices: Existing as shown on drawings.

Part 3 Execution

3.1 INSTALLATION

.1 Protect all fire alarm devices from dust and physical damage during work activities.

.2 Temporarily relocate devices as required. Relocated devices to be reinstalled in similar locations as existing upon completion.

.3 Provide full time fire watch at any time the system is partially or completely disabled.

.4 System to be restored and fully operational upon completion of work activities.

.5 Any new wiring required to relocated devices shall be listed armored flexible metallic fire alarm cable.

3.2 SYSTEM VERIFICATION

.1 An authorized representative of the fire alarm system manufacturer is to make a thorough inspection of the complete installed fire alarm system including all components such as manual stations, thermal detections, products-of combustion detectors, and controls to ensure the following:

1. System is complete and functional in accordance with specifications and drawings.
2. System is installed according to CAN/ULC S524 requirements.
3. System is installed in accordance with manufacturer's recommendations.
4. Regulations covering supervision of components are adhered to.
5. Subsequent changes necessary to conform to Items 1, 2, 3 and/or 4 to be done by Division 28 with technical assistance supplied by the manufacturer.
6. During the period of the verification inspection by the manufacturer, supply to the manufacturer one journeyman electrician who is thoroughly familiar with the project.
7. During the period of the verification inspection, provide one representative of the manufacturer who is capable of, and authorized for, making all system alterations or programming functions. The manufacturer's representative and the verifying inspector may be the same individual if sufficiently qualified.
8. Manufacturer to submit to Departmental Representative on completion of inspection a point-by-point check list indicating date and time of each item inspected and also issue a Certificate for his records confirming that inspection has been completed and system is installed and functioning in accordance with the specifications. Included with this Certificate to be satisfactory- proof of liability insurance valid for not less than one (1) year from date of final inspection.
9. Certificate to be free from defining and qualified statements, which would make it unacceptable by the Departmental Representative.
10. Verification shall be performed by manufacturer's certified representative with contractor's assistance. verification results shall be documented by the manufacturer's representative on the manufacturer's comprehensive fire alarm verification forms.
11. All aspects of the system verification are to be conducted in the presence of the Departmental Representative or his designated representative.
12. Notify Departmental Representative of verification date and time at least ten business days in advance.
13. Verification may be performed only after:
    .1 Building is at a state of completion that will ensure a reasonably dust free environment and the absence of contaminating fumes from verification date to final completion.
14. Manufacturer to provide sufficient backup parts on site during verification to accommodate any component failures. Backup parts not used during verification can be removed from site by the manufacturer. Recommended back-up parts list:
    .1 2 fire detectors

.2 2 smoke detectors

.3 2 pull stations

.4 2 horn-strobes and electronics.

.5 1 CPU programming chip

.6 Any additional parts pertinent to the particular manufacturer that may possibly fail resulting in cancellation of the verification.

15. Provide two fully charged hand held two-way voice communication radios during verification.

16. Provide all testing equipment and material required for testing smoke detectors and heat detectors during verification. Testing methods are to be as approved by manufacturer. As per CAN/ULC-S537 article 5.4.1.3, each smoke detector shall be tested to confirm that it is within its rated operating range using one of the following methods:

    .1 Using a ULC approved smoke density measurement instrument for verification of smoke detectors. Canned smoke alone is not acceptable.

    .2 Installed control units or transponders designed to test the sensitivity of individual smoke detectors.

    .3 Manufacturer's recommended test instrument, equipment or method. This method is acceptable only when complete official description of the manufacturer's recommended method, including the description of material, devices and equipment is submitted for Departmental Representative's review at least four (4) weeks prior to the verification date.

    .4 Similar for heat detectors.

17. Provide all testing equipment and material required for testing sound levels of the fire alarm signaling devices during verification.

18. Verification to be performed by the system manufacturer or it's qualified representative, certified to verify fire alarm system within the Yukon Territory.

19. Schedule the work at the outset of the construction so that work schedules are properly coordinated to ensure that the verification is complete prior to achieving substantial performance and occupancy.

3.3 FIELD QUALITY CONTROL

.1 Perform tests in accordance with CAN/ULC-S537.

.2 Pretest the system prior to request for verification inspection and troubleshoot all deficiencies. Submit a copy of successful pretesting report along with the request for fire alarm verification field review.

.3 Fire alarm system:

1. Test each device and alarm circuit to ensure manual stations, thermal and smoke detectors, sprinkler system (flow), transmit alarm to control panel and actuate first stage alarm general alarm ancillary devices.

2. Check annunciator panels to ensure zones are shown correctly.

3. Simulate grounds and breaks on alarm and signaling circuits to ensure proper operation of trouble signals.
4. Simulate and test all auxiliary functions.
5. Record sound pressure levels at various areas throughout the building including the acoustically most remote locations. Report to Departmental Representative any areas where sound pressure is not at least 65dB or at least 10dB above the ambient noise levels, or where sound pressure level exceeds 110 dB. Should SPL exceed 110 dB, and cannot be reduced with setting adjustments on device, device to be replaced with a visual-only device, or with Departmental Representative's express consent, device to be removed and blanked off.
6. Simulate and test alarm and monitoring indication functions at building's control & automation panel.
7. Class A Circuits:
   .1 Test each conductor on all circuits for capability of providing alarm signal on each side of single open-circuit fault condition imposed near mid-post point of circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.
   .2 Test each conductor on all circuits for capability of providing alarm signal during ground-fault condition imposed near mid-post point of circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.
8. Pay for all testing costs, excluding those of the Departmental Representative for single-time witnessing the verification. It is the contractor's responsibility to coordinate the verification and pretest the system prior to verification to minimize the efforts and cost.

END OF SECTION