

STATEMENT OF WORK
Oak Hall Roof Replacement
Klondike National Historic Site Complex

09 March 2015

Objective

Replacement of the existing roof including skylights on the Oak Hall (Winaut's Store) building in Dawson City.

Background

Introduction

The building was originally constructed in 1902. It is in fact three interconnected buildings. The complex served as various clothing and general merchandise stores over its life from 1902-1957, when it was abandoned. Between 1981 and 1986 Parks Canada undertook restoration of the exterior facades of the building (see figure 1). The building is classed as a recognized building by the Federal Heritage Building Review Office (FHBRO). The Heritage Character Statement is included in Appendix A.

The building had a number of innovative architectural/engineering details for its time, such as a complex timber truss spanning the full width of the building to carry the roof loads. A suspension rod is dropped from the centre of this truss to carry the second floor central beam and allow for a clear span for the ground floor and the large windows in the front facade. This rod was replaced with a post in 1999. Large pre-fabricated skylights were placed in the roof to allow lighting of the interior of the building.

In the late 1990's and early 2000's Parks Canada did some major internal renovations to the building to turn it into office space for Parks use (Appendix B contains some drawings of the building renovations). The old warehouse in the rear of the building was demolished in 1997 and an annex added to house a conservation lab on the ground floor and interpretator's area on the second floor. The annex is on a separate pile foundation, while the original portions of the building are on cribbing. The original low slope, flat seam roof had an interlocked flat solder seam. Repairs including patches and tarring of seams were required when renovations were done (see figure 2). The new annex utilized a pitched corrugated galvanized metal roof structure.

In 2008 due to some roof leakage problems the original flat seam roof was replaced with corrugated metal on the main building except for the lower one story section at the south end of the building which retained the original roof.

In 2013-14, Parks Canada engaged the services of Kobayashi + Zedda Architects Ltd. of Whitehorse, to examine and develop a proposal for a redesigned roof that respected the heritage defining elements of the building yet providing a modern solution to the problems described below with the existing roof.

Current Issues

Not long after Parks Canada staff moved into the building the following problems were identified:

- leakage around the perimeters of the skylights and localized locations throughout roof; (see figure 3);
- excessive condensation from within the skylights and water dripping from them as a result (see figure 4);
- noticeable heat loss as seen on portions of the roof (see figure 5,6,7);
- excessive ice damming on lower portions of the roof as a result of heat loss (see figure 8,9);
- probable damage to roof structure and vapour barrier as a result of ice damming and leakage into interior (see figure 10, 11);
- leakage in transition zone (breezeway) between the new annex and the original building (see figure 12).
- Leakage through seams in the roof.

Various pictures of the existing roof are included:

- Figure 13: Current roof, looking towards rear and Annex
- Figure 14: Current roof, looking to front
- Figure 15: Skylights
- Figure 16: Southern lower roof on building and covered skylight
- Figure 17: Breezeway roof
- Figure 18: Space between second floor suspended ceiling and roof
- Figure 19: Skylight framing in attic space
- Figure 20: Suspended blown-in insulation in attic

Scope

Replacement of the existing roof and skylights as per the specifications and drawings by Kobayashi + Zedda Architects Ltd. dated March 2014. See appendix C.

General Tasks/Specifications

The detailed specifications for the reconstruction of the roof are listed in Appendix C. Other general requirements for the project are listed below:

1. The heritage character defining elements of the building (see appendix A) should be respected, the design minimizes any alteration of these elements these elements must be respected during construction;
2. All work shall follow the Standards and Guidelines for the Conservation of Historic Places in Canada;
3. The Contractor will be responsible for obtaining all required permits from the Authorities Having Jurisdiction;
4. The Contractor will be responsible to ensure that no direct or indirect precipitation enters the building during any stage of the roof demolition or construction process;
5. Parks Canada staff normally working on the second floor of the building will be relocated to the ground floor for the duration of the roof replacement. The bottom floor is also occupied by Service Canada through the week. Employee and public access is required to be maintained for the front (Second Avenue) of the building;
6. Parks Canada will have moved most items from the second floor to temporary space on the ground floor although a few larger items may remain (ie. fridge) that will need to be moved around by the Contractor as required;
7. All communications (voice and data) for the building route through the LAN room that is located on the second floor. This room must remain functional and protected from damage at all times through the project (see Figure 21).

8. The second floor of the Annex at the rear of the building contains Parks Canada's interpreter's locker/change room. Access to the breezeway stair case (Figure 12) Parks Canada interpretative staff will be required for the duration of the project. Should there be times when access to this stairway needs to be restricted for short periods, Parks Canada staff must be notified 24 hours in advance, so alternative arrangements can be made for the interpretative staff;
9. Disposal of all waste material on a regular basis;
10. As per notes on Drawing A401 (Appendix C specifications):
 - Note 6: The existing heritage skylights are to be removed in as intact a condition as possible, and will be retained by Parks Canada;
 - Note 7: Parks Canada staff will be responsible for removing and replacing the corrugated metal siding on the south side of the building. **Three working days' notice** must be given to Parks staff for removal/replacement;
 - Note 8: The outward appearance of the parapet as viewed from the street side shall not be altered;
 - Note 9: Heating and ventilating equipment on the roof must remain in operation for the duration of the project, although temporary relocation will be required;
 - Note 10: There is extremely limited material laydown space on the site. A section of the Palace Grand parking lot one block away can be made available although the Contractor is responsible for the security of materials left in this location.

Client Support

Parks Canada can supply all drawings used in the late 1990's renovations to the buildings. A drawing list is attached in Appendix D.

The design architects for the project Kobayashi + Zedda Architects Ltd. (KZA) will be available for questions during the tender and construction periods. KZA will also be conducting periodic construction inspections and reporting.

Contractor Responsibilities

The contractor is responsible for:

- All travel arrangements to and from the site and room and board during the construction phase;
- Confirming that actual building construction is as per supplied drawings;
- All requirements for occupational health and safety such as fall arrest and confined space entry, if required;
- The Contractor must comply with all applicable legislation, codes, guidelines for work on National Historic Sites;
- Weekly construction updates via e-mail to Parks Canada and KZA;
- All other conditions as per detailed specifications in Appendix C.

Meetings

It is anticipated that the following meetings will be required:

- i. A non-mandatory site visit will be arranged as specified in the tender documents;
- ii. Initial on site meeting prior to construction commencement,;
- iii. Post-construction on site meeting/inspection of the worksite;
- iv. Any other meetings/teleconferences as required by the Contractor, Parks Canada, or KZA.

Deliverables

As built drawings in PDF or Autocad format of any modifications or deviations from the design construction drawings.

All written reports shall be provided in Adobe PDF format.

Project Administration Requirements

The Contractor shall maintain direct communication with the Parks Canada Technical Authority.

All formal directions regarding project scope, budget, schedule, etc. must come from the Parks Canada Technical Authority, in writing. The Contractor will be responsible for arranging all meetings necessary to complete the project.

The Contractor shall not respond to requests for project related information or questions from the media. All media related inquiries are to be directed to the Parks Canada's Technical Authority.

Schedule

The building will be available for construction as of May 1, 2015. In order to take advantage of better weather in the early part of the summer construction is expected to commence at the earliest possible opportunity and proceed in a timely manner to minimize disruptions to Parks Canada operations.

As built drawings and are required 60 days past the substantial completion date.

FIGURES



Figure 1: Oak Hall Front Elevation



Figure 2: repairs to original roof



Figure 3: Skylight Leakage



Figure 4: Skylight Condensation



Figure 5: Roof Heat Loss (Feb. 2013)



Figure 6: Roof Heat Loss (Feb. 2013)



Figure 7: Roof Heat Loss (Feb. 2013)



Figure 8: Ice damming at rear of roof (Feb. 2013)



Figure 9: Ice damming at rear of roof



Figure 10: Leakage in kitchen, rear of roof



Figure 11: Leakage in mechanical room, transition way to Annex

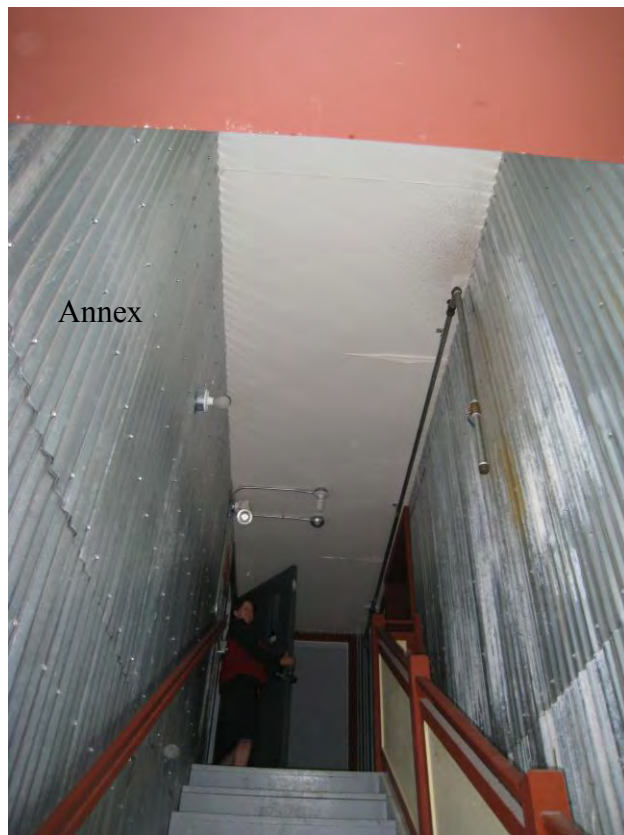


Figure 12: Breezeway area leakage indications



Figure 13: Roof looking back to Annex



Figure 14: Roof looking towards front



Figure 15: Skylights



Figure 16: Lower roof with Coroplast frame over skylight



Figure 17: Transition zone between Annex and front of building



Figure 18: Attic space between suspended ceiling and roof near front of building



Figure 19: Skylight frame in attic space



Figure 20: Suspended blown-in insulation in attic space



Figure 21: LAN Room

APPENDIX A

Heritage Character Statement

Dawson City
Winaut's Store
Second Avenue just north of Queen Street

HERITAGE CHARACTER STATEMENT

The commercial block commonly known as Winaut's Store is in fact three connected buildings, erected by the Syndicat Lyonnais du Klondike in 1902.

Between 1902 and the final abandonment of the block in 1957, a number of external modifications were made to the block by a succession of restaurateurs and dry goods dealers. Between 1981 and 1983 Parks Canada undertook the restoration of the principal facade. The side and rear elevations were rehabilitated in 1986.

The building is owned by Parks Canada; interpretive displays have been installed in the show windows. See FHBRO Building Report 86-89.

Reasons for Designation

Winaut's Store was designated Recognized because of its thematic Associations, the special role it played in the development of the community, the visual qualities of the building, and the fine workmanship and skillful use of materials displayed in its construction. The building's environmental significance derives from the integrity of its relationship with the street, the contribution it makes to the character of the historic district, and its strong identity within the community.

The theme most closely identified with the building is the post-gold rush development of Dawson as a goods and service centre for the Klondike gold fields. The tenancies of William Horkan, a restaurateur (1902-1903); Frank W. Herring, a men's outfitter (1902-1906); Samuel J. Stewart and Harold W. England, clothiers and haberdashers (1910-1916); Herbert Winaut, a clothing merchant (1926-1942), and Jack Butterworth, a dealer in general merchandise (1942-1957), represent a continuity of commercial enterprise directed at Dawson's predominantly male population, and notable for its consistency and longevity.

The construction by Syndicat Lyonnais du Klondike of a new commercial block on Second Avenue in spring 1902 was a clear expression of confidence in the future of that commercial thoroughfare. The choice of an ornate and finely proportioned street face, of a type usually reserved for the higher valued properties on Front Street, set a new standard for Second Avenue businesses.

The northernmost building embodies a number of innovative and daring architectural/engineering details which demonstrate a sophistication not generally found in boomtown fronted structures. To accommodate the enormous oriel window at the second floor, a complex timber lattice truss spanning the full width of the building

was introduced to carry the roof loads. To establish a clear span at the ground floor, an enormous suspension rod was dropped from the centre of the same truss to pick up the end of the central beam.

To flood the interior with daylight, large prefabricated sheet metal ridge-type skylights were placed on the roof. Beneath each is a correspondingly large lightwell to allow daylight to penetrate to the ground floor. Because the skylights are positioned over the central girder, the member is interrupted at each opening and the ends taken on posts. In addition to these structural novelties, all of the light framing members have been carefully wrapped in asbestos paper and the exterior sheathed in corrugated iron to render the building fireproof.

The relationship of the building to the street it faces, if one overlooks the change in elevation necessitated by the lifting of neighbouring buildings, is essentially the same as in 1902. While no longer part of an intact period streetscape, Winaut's is an important component at an historically important street intersection (Second Avenue and Queen Street), and is critical to its preservation. The position of the building on a busy pedestrian thoroughfare, opposite one of Dawson's largest hotels, and next door to one of Dawson's last surviving general merchandise retailers, has contributed to its conspicuous identity within the community.

Character Defining Elements

The heritage character of the block derives mainly from the boomtown architectural treatment given the street elevation in 1902. On the northernmost building, notable features include the deep entablature (a bold projecting cornice and false gable peak carried on four fanciful columns supported on corbels), the tall flagpole with weathervane, the corner pilasters enriched by decoration, and the enormous wood oriel window. A less imposing oriel window is the sole remarkable element belonging to the centre building. A large plate glass front (a recessed double front door, transom and splayed sidelights flanked by show windows, partitioned at the interior), which replaced the original ground floor fronts of all 3 buildings c.1910, is equally deserving of careful preservation. Essential to the heritage character of the block are the original and reproduction commercial signs painted on canvas and hung on the block or painted directly on the various wall surfaces.

The interior of the northernmost building is notable for the 1902 system of posts and girders, framed lightwells and roof skylights, which together, permitted the illumination of both the ground and second floors by daylight. A tenancy which would accommodate and utilize this innovative feature is encouraged.

The historic relationship between the block and the busy commercial thoroughfare of Second Avenue derives in part from the proximity of the building to the board walk, the dressed show windows, and the presence of such street furniture as the pipe-framed fixed awning, outdoor displays, and wood bench. The maintenance and/or development of these elements will contribute to the Gold Rush character sought by the community.

Considering the commercial character of the ground floor (recessed entrance, extensive show windows), the residential character of the second floor (oriel windows, stair access direct to street), and the use generally proclaimed by the period signage, the most appropriate and easily accommodated use for the building would be a combined commercial/residential tenancy.

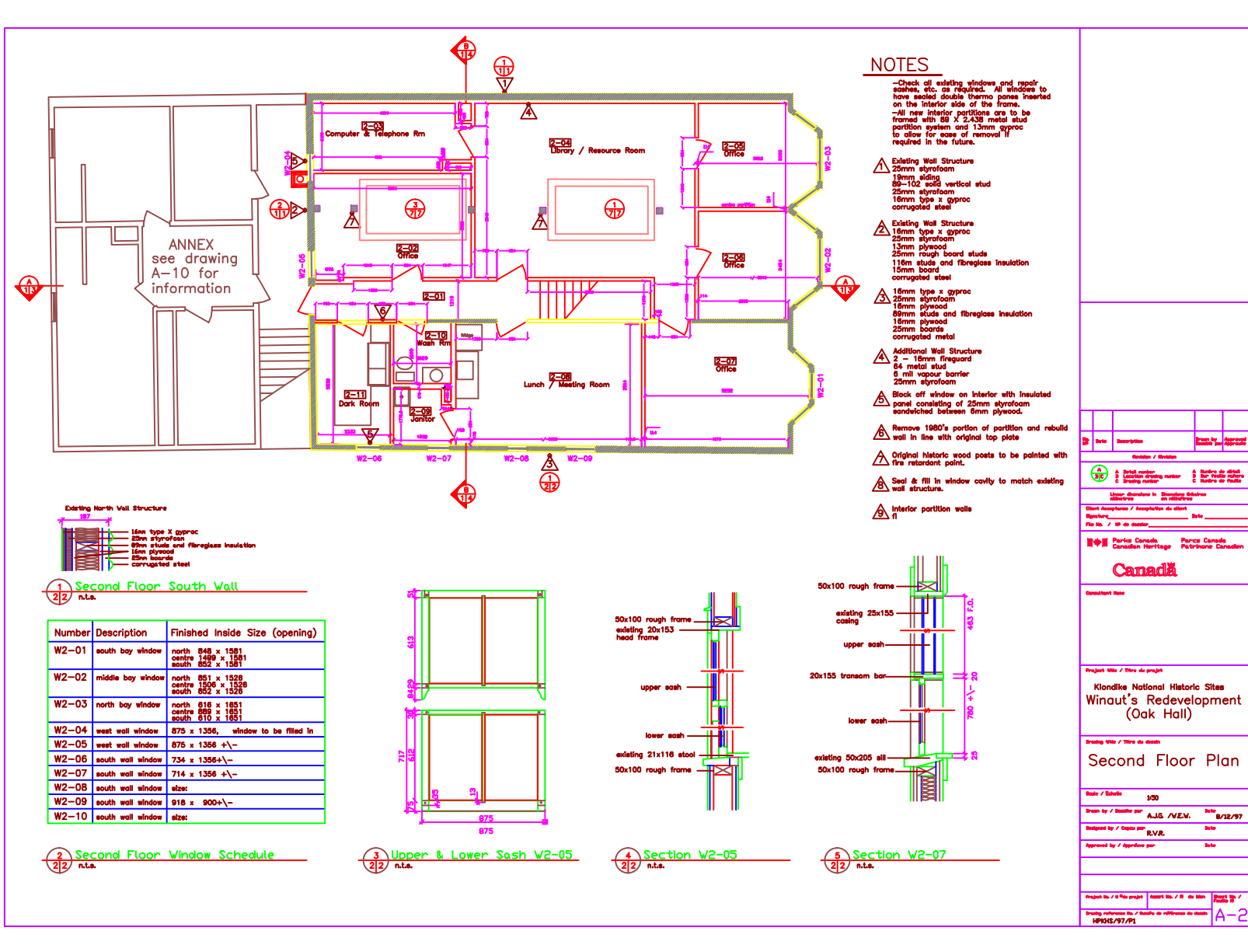
A cluster of outbuildings, contemporary with the main block, which adjoined the west wall and extended back to the lane, was demolished before 1908. The existing detached warehouse dating from the 1930s is not included in this designation.

1994.06.22

APPENDIX B

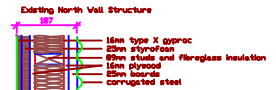
1997 Redevelopment Drawings

- A-1 First Floor Plan Dec. 15/97
- A-2 Second Floor Plan Dec. 8/97
- A-3 Longitudinal Section and Details Dec. 15/97
- A-4 Cross Section and Details Dec. 8/97
- A-7 Second Floor Skylight Details Nov. 25/97
- A-3 Annex Building Aug. 5/97



NOTES

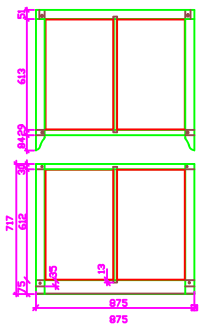
- Check all existing windows and repair sashes, etc as required. All windows to have sealed double thermo panes inserted on the interior side of the frame.
- All new interior partitions are to be framed with 88 X 2.438 metal stud partition system and 13mm gyproc to allow for ease of removal if required in the future.
- Existing Wall Structure
25mm styrofoam
13mm siding
88-102 solid vertical stud
25mm styrofoam
16mm type x gyproc
corrugated steel
- Existing Wall Structure
16mm type x gyproc
25mm styrofoam
13mm plywood
25mm rough board studs
115m studs and fibreglass insulation
15mm board
corrugated steel
- 16mm type x gyproc
25mm styrofoam
16mm plywood
88mm studs and fibreglass insulation
16mm plywood
25mm boards
corrugated metal
- Additional Wall Structure
2 - 16mm fireguard
64 metal stud
6 mil vapour barrier
25mm styrofoam
- Block off window on interior with insulated panel consisting of 25mm styrofoam sandwiched between 6mm plywood.
- Remove 1960's portion of partition and rebuild wall in line with original top plate
- Original historic wood posts to be painted with fire retardant paint.
- Seal & fill in window cavity to match existing wall structure.
- Interior partition walls fit



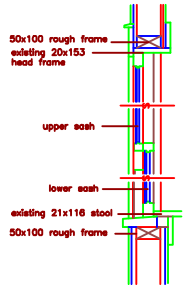
1/2/2 Second Floor South Wall
n.l.a.

Number	Description	Finished Inside Size (opening)
W2-01	south bay window	north 848 x 1581 centre 1488 x 1581 south 852 x 1581
W2-02	middle bay window	north 851 x 1528 centre 1308 x 1528 south 852 x 1528
W2-03	north bay window	north 616 x 1831 centre 888 x 1831 south 610 x 1831
W2-04	west wall window	875 x 1356, window to be filled in
W2-05	west wall window	875 x 1356 +/-
W2-06	south wall window	734 x 1356 +/-
W2-07	south wall window	714 x 1356 +/-
W2-08	south wall window	size:
W2-09	south wall window	918 x 900 +/-
W2-10	south wall window	size:

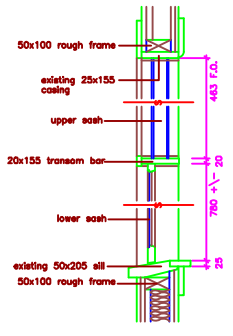
2/2/2 Second Floor Window Schedule
n.l.a.



3/2/2 Upper & Lower Sash W2-05
n.l.a.



4/2/2 Section W2-05
n.l.a.



5/2/2 Section W2-07
n.l.a.

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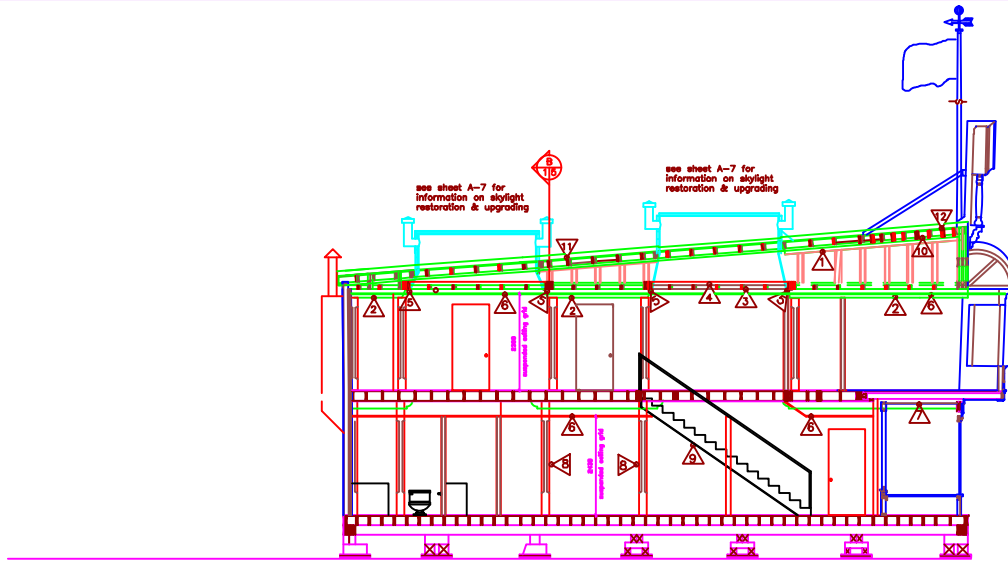
Client: Purvis Canada / Canadian Heritage
 Purvis Canada / Patrimoine Canadien



Project Title / Titre du projet
 Klondike National Historic Sites
 Winaut's Redevelopment
 (Oak Hall)

Drawing Title / Titre du dessin
 Second Floor Plan

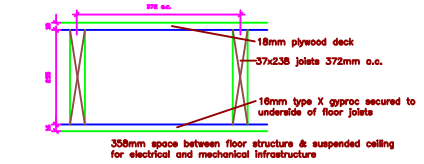
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Designed by / Conçu par	R.V.R.
Approved by / Approuvé par	
Date	8/12/97



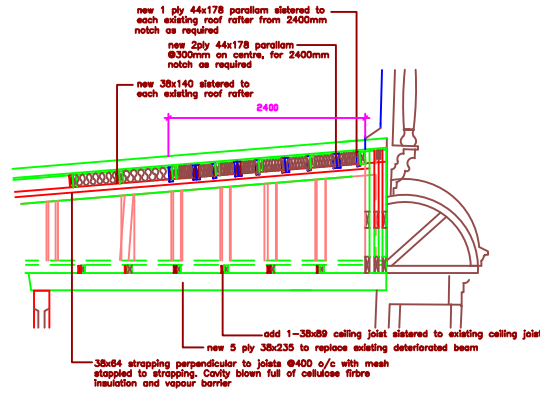
NOTES

- ⚠ 38x84 strapping perpendicular to joists @400o/c with mesh stapled to strapping. Cavity blown full of cellulose fibre insulation (CSSB51-GP-50M) and vapour barrier. Approx R32.
- ⚠ New 5 ply 38 X 235 to replace existing deteriorated beam.
- ⚠ Add one 38 X 89 mm ceiling joist splayed to existing ceiling joists.
- ⚠ Add 3-ply 44 X 178 parallel header on each side of skylights.
- ⚠ Add four new 4-ply 44 X 178 parallel beams, one at each end of skylights.
- ⚠ Suspended ceiling grid system
- ⚠ Install vapour barrier and insulate ceiling cavity above display windows. Repair ceiling referring to daga 9 and 10 HPDC 81/H13.
- ⚠ Original wooden posts to be painted with fire retardant paint.
- ⚠ Build new stairs. 17 risers @182mm Run 262 X 18. Total run 4191mm.
- ⚠ Add one ply 44 X 178 parallel splayed to existing rafters for 2440 mm. Notch as required.
- ⚠ Add one 38 X 140 rafter to each existing rafter.
- ⚠ Add 2 ply 44 X 178 parallel between existing rafters for 2440 mm. Notch as required.

A Longitudinal Section A (looking North)



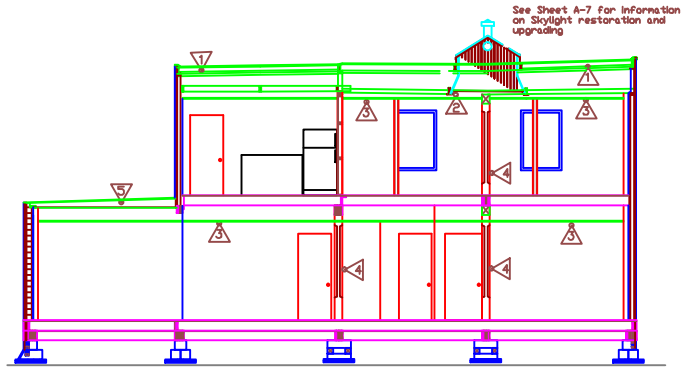
1 Second Floor Detail
n.t.s.



2 Enlargement Section of South End of Building
n.t.s.

3 detail

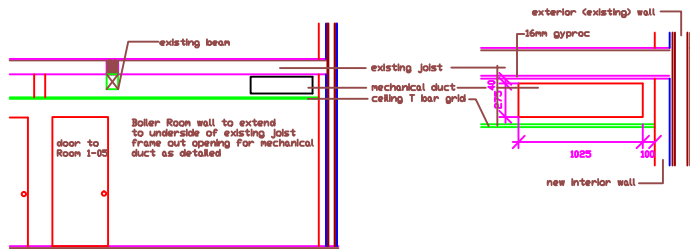
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C	Drawing number		
D			
Lignes de référence en description techniques			
Client Approbation / Approbation du client			
Signature:	Date:		
File No. / N° de dossier			
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Canada			
Dessinateur/Drawn			
Projet/Title / Titre du projet			
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Dessing/Title / Titre du dessin			
Longitudinal Section & Details			
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Designed by / Dessiné par		R.V.R.	Date
Approved by / Approuvé par			Date
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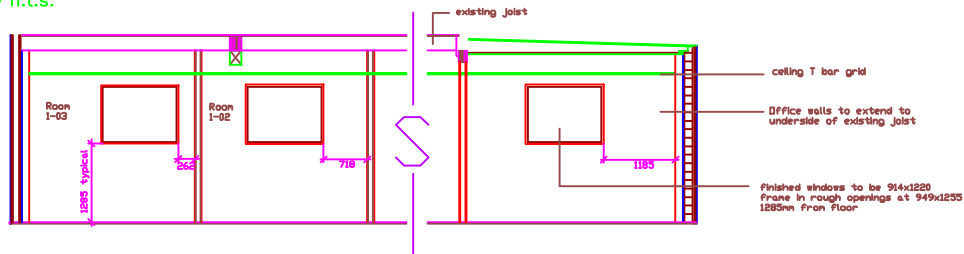
NOTES

- △ 38x84 strapping perpendicular to joists @400o/c with chicken wire stapled to strapping. Cavity blown full of cellulose fibre insulation (CSB55) GP-80M and vapour barrier Approx. R32.
- △ Four new built up beams at each end of skylights, see sheet A-7
- △ Suspended ceiling grid system
- △ Original wooden posts to be painted with fire retardant paint.
- △ add 1 tapered 44x286 parallel to each existing rafter.

B
1 4 Section B

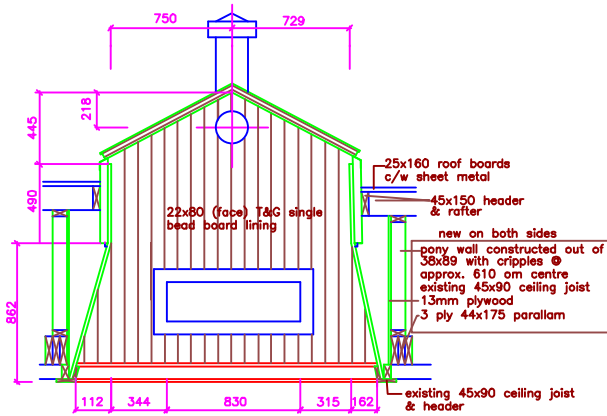


2
2 4 Elevation of Mechanical Room Wall
n.t.s.

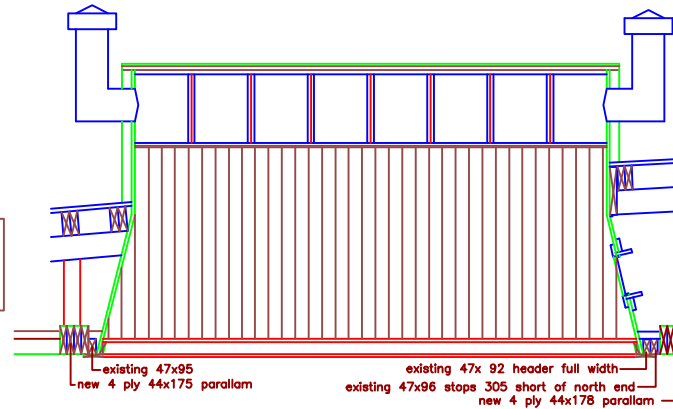


3
2 4 Elevation of Window Opening for Front Offices
n.t.s.

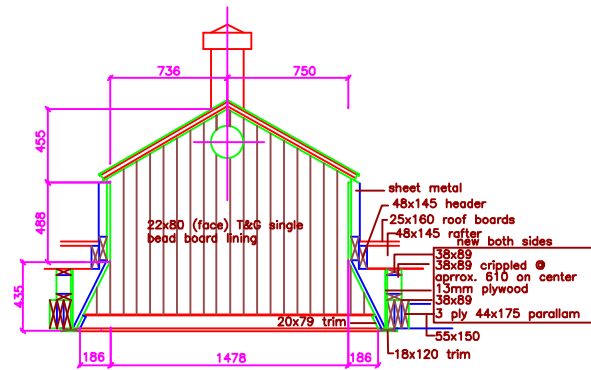
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C	Quantity number / Numéro de devis	D	Revised by / Révisé par
Lignes d'approbation et de révisions			
Client Approbation / Approbation du client			
Approuvé: _____		Date: _____	
File No. / N° de dossier: _____			
Parcs Canada Canadian Heritage		Parcs Canada Patrimoine Canadien	
Canada			
Consultant Name			
Project Title / Titre du projet Klondike National Historic Sites Winaut's Redevelopment (Oak Hall)			
Drawing Title / Titre de dessin Cross Section & Details			
Scale / Echelle: 1/50			
Drawn by / Dessiné par: A.J.G. / V.E.M.		Date: 8/28/97	
Designed by / Conçu par: B.V.R.		Date:	
Approved by / Approuvé par:		Date:	
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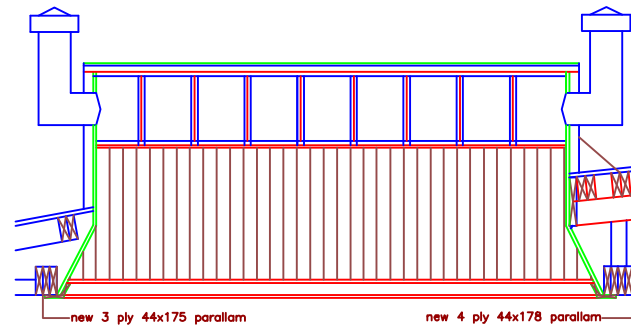
1 East Skylight Section (looking East)
Scale 1:12.5



2 East Skylight Section (looking North)
Scale 1:12.5



3 West Skylight Section (looking West)
Scale 1:12.5



4 West Skylight Section (looking North)
Scale 1:12.5

General Notes

Details 1,2,3 & 4. The existing information is taken from drawing HPDC 81/H13 Sheet 22 refer to this drawing for additional information as required.

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Project Title / Site or Project Kanata National Historic Site Winaut's Redevelopment (Oak Hall)				
Working Title / Title of Sheet Second Floor Skylight Details				
Date / Status: as noted				
Drawn by / Scale: W.E.W 25/11/07				
Designed by / Notes: R.V.R.				
Approved by / Approval:				
Project Number: _____ Asset Number: _____				
Working Drawing Number: _____				
				A-7

APPENDIX C

Detailed Specifications and Drawings

Oak Hall Roof Re-Design
Issued for Tender

Dawson City, Yukon
March 2014

Kobayashi and Zedda Architects Inc.

Oak Hall Roof Re-Design

Issued for Tender

Dawson City, Yukon
March 2014



 Parks Canada Parcs Canada

kobayashi+zedda

exp Services Inc.

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Note: Parks Canada Agency INSTRUCTIONS TO BIDDERS and TENDER FORMS are included elsewhere. Pages 4 to 8 of the KZA document are not included.

PART 1 GENERAL

1.1 Summary of Work

- .1 Work of this Contract includes the supply of all labor and materials for roof reconstruction of the existing Oak Hall heritage building in Dawson City, Yukon, but is not limited to the following:
 - .1 Rigid insulation boards; SBS membrane roofing; self-adhered membrane; spray foam insulation; demolition; aluminum storefront; skylights; gypsum wallboard; interior painting; flashing.
 - .2 Coordination of sub-contractors.
 - .3 Liaison with Owner and the architect.
 - .4 Securing and paying for all fees and permits.
 - .5 Mobilization and demobilization costs.
 - .6 All work within the extent of contract.
 - .7 Dumpster rental and coordination of all rental costs (including heavy and light equipment).
 - .8 All architectural work shown on drawings.
 - .9 Coordination and management of staging areas.
 - .10 Site cleanliness including progressive cleaning.
 - .11 Existing skylights and metal roofing to be salvaged and removed with care. This salvage to remain property of Parks Canada.

1.2 Drawings

- .1 The drawings accompanying this specification and forming part of the contract documents are:
 - .1 Architectural:
 - .1 A401 Roof Plan
 - .2 A601 Building Sections
 - .3 A701 Details
 - .4 A702 Details

1.3 Completion Date

- .1 The contractor must achieve Substantial Performance by _____, 2014.

1.4 Contractor's Use of Premises

- .1 The Contractor is limited to the use of the area defined as limit of work as shown in the drawings only for all work, staging and storage unless arranged otherwise with owner's representative. Contractor shall assume responsibility for areas assigned to him/her for performance of work. All encroachments onto public or private property, that may become necessary, are to be cleared with the land owner and the authorities having jurisdiction.

- .2 The contractor is responsible for adequate safety measures in conformance with all applicable codes (hoarding, securing of equipment and tools, etc.) in order to protect the public and building occupants from harm.
- .3 Contractor to maintain owner access to rear stairs for second floor change room access. Entire main floor to remain accessible for owner occupation. Provide protective enclosures as necessary. Contractor to coordinate periods of non-access with owner.
- .4 Contractor to ensure weathertight sealing of building at the end of each day and during the day if rain or adverse weather conditions are present.
- .5 Provide protection for finished and partly finished building finishes and equipment during performance of Work. Provide necessary screens, covers and hoardings.
- .6 All unused stock and materials to become contractor's salvage.
- .7 Access to the area of the work will be as directed by the Owner's representative on site. This includes identifying suitable material storage and delivery of materials on site.
- .8 Contractor to maintain drive aisle in alley by reducing parking and material storage behind building. Additional off site laydown area can be coordinated with owner.
- .9 Coordinate noisy work that may adversely affect main floor occupants, as well as adjacent building and property occupants.

1.5 Owner Occupancy

- .1 Owner shall have the right to enter and occupy the project Work in whole or in part for the purpose of placing fittings and equipment or for the use before the completion of the contract, if such an entry and occupation does not prevent or interfere with the completion of the contract within the time specified.

1.6 Communications

- .1 Site communications:
 - .1 Contractor to have site or cellular phone.
 - .2 Contractors will ensure daily access to e-mail.

1.7 Schedules

- .1 Provide Owner with work schedule indicating anticipated progress stages for review within seven (7) days of contract award.
- .2 Before submitting first progress claim, submit Schedule of Values to Architect. After approval, it will be used as the basis for progress payments.

1.8 Submittals

- .1 Skylights
 - .1 Submit samples of window frame material.

1.9 Shop Drawings

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

- .2 Indicate materials, methods of construction and attachment or method of anchorage, erection diagrams, connections, explanatory notes and other information necessary for the Completion of the Work. Where articles of equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of the Section under which the adjacent items will be supplied and installed. Indicate cross references to design drawings and Specifications.
- .3 Adjustments made on shop drawings by the Architect are not intended to change the Contract Price. If adjustments affect the value of the Work, state such in writing to the Architect prior to proceeding with the Work.
- .4 Make changes in shop drawings as the Architect may require, consistent with Contract Documents. When re-submitting, notify the Architect in writing of any revisions other than those requested.
- .5 Submit required number of shop drawings, which Contractor requires for distribution, plus 1 (one) electronic copy that will be retained by the Architect.
- .6 Submit 1 (one) electronic copy of product data sheets or brochures for requirements requested in Specifications Sections and as the Architect may reasonably request where shop drawings will not be prepared due to standardized manufacture of product.
- .7 If upon review by the Architect, no errors or omissions are discovered or if only minor corrections are made, the transparency copies will be returned and fabrication and installation of work may proceed. If the shop drawings are rejected, noted copy will be returned and must be re-submitted, through the same procedures indicated above, shall be performed before fabrication and installation of Work may proceed.
- .8 Provide shop drawings for the following:
 - .1 Skylights
 - .1 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim, junction between combination units, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer's nameplates.
 - .2 Contractor must not proceed with skylight manufacturing prior to design approval by both architect and owner.

1.10 Health & Safety Requirements

- .1 Construction Safety Measures:
 - .1 Observe and enforce construction safety measures required by the National Building Code (latest edition), Yukon Government and Yukon Workers' Safety & Compensation Commission.
- .2 Exits:
 - .1 Ensure required fire exits are maintained through normal operating hours.
- .3 Pollution Control:

- .1 Prevent the escape of untreated effluent, be it liquid or gaseous substance, or any liquid or solid waste, being objectionable or detrimental to adjoining areas of the construction site.
- .2 Burning of waste, rubbish, etc., on site is not permitted
- .3 Only fires for heating materials and temporary heaters as specified are permitted on site, upon written approval of the Architect.
- .4 Take care to prevent staining or smoke damage to existing structure or material. Replace with new materials any stained or damaged work.
- .5 Ventilate to prevent build-up of toxic levels of contaminants.
- .4 Environmental Controls:
 - .1 Provide environmental protection to surrounding areas, take precautionary measures to prevent excessive noise, sounds, vibrations, dust, air pollution, smoke, etc., which may become objectionable to others occupying adjacent areas.
- .5 Equipment Controls:
 - .1 The Contractor shall be responsible for repair of damage to adjoining property and Owner shall be saved harmless from any litigation arising out of any such damage.
 - .2 Protect from damage existing roadways, poles, trees, grassed areas, etc., on or surrounding construction site and adjacent to roads leading thereto. Make good any damage or disfigurement with materials identical to existing and adjoining work surfaces.
- .6 First Aid:
 - .1 Provide First Aid facilities as required by authority having jurisdiction.
- .7 Posting of Documents:
 - .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of the Territory having jurisdiction, and in consultation with Consultant.
- .8 Correction of Non-Compliance:
 - .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Architect.
- .9 Fire Prevention:
 - .1 Provide and maintain temporary fire protection equipment during performance of work.
 - .2 Take all necessary precautions to eliminate fire hazards and instruct superintendent to make periodic inspections to ensure proper preventative measures are being complied with by all personnel working on the site.
 - .3 Where flame work is required, the trade concerned shall provide additional fire safety measures considered necessary to protect existing facilities from fire. A suitable fire extinguisher shall be provided by contractor directly adjacent to work.

1.11 Regulatory Requirements

- .1 Perform Work in accordance with National Building Code of Canada 2010 (NBCC), including amendments up to application for building permit and other codes of territorial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Materials and workmanship must conform to, or exceed applicable standards of the Canadian Government Specification Board (CGSB), Canadian Standards Association (CSA), American Society of Testing and Materials (ASTM) and other referenced organizations.
- .3 The Contractor is required to ensure that existing and proposed penetrations through existing or proposed fire separations are fire stopped as per code requirements.
- .4 Authorities Having Jurisdiction:
 - .1 The Contractor is to obtain all permits, pay all fees and arrange for all inspections as required by authorities having jurisdiction.
 - .2 Give 96 hours notice requesting Building inspection, at least at the following milestones and wherever required by Building Inspection Authorities:
 - .1 Vapour barrier and insulation installed.
 - .2 Occupancy.
- .5 Building Smoking Environment: Comply with smoking restrictions and municipal by-laws.

1.12 Quality Control and Product Requirements

- .1 Ensure quality and workmanship are adequate to satisfactorily complete the work and conform to the standards generally accepted in the trade, and in conformance with the drawings and specifications.
- .2 The Owner or his authorized representative may reject any part of the work which, in his opinion, does not comply with the requirements of the specifications and drawings. Any such defects or rejected work to be rectified at the contractor's expense.
- .3 Products, materials, equipment and articles incorporated in work shall be new, undamaged, nor defective, and of best quality for the purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .4 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. Notify Architect if delays in the supply of products are foreseeable in order that substitutions or other remedial action may be authorized in ample time to prevent the delay in performance of Work.
- .5 Storage, Handling and Protection:
 - .1 Handle and store Products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
 - .2 Store packaged or bundled Products in original and undamaged condition with manufacturer's seals and labels intact.
 - .3 Store product subject to damage from weather in weatherproof enclosures.

- .4 Contractor is solely responsible for materials stored on site. Owner will not be responsible for stolen or damaged items.
- .6 Transportation:
 - .1 Pay costs of transportation of products required in the performance of Work.
- .7 Manufacturer's Instructions:
 - .1 Unless otherwise indicated, install or erect Products in accordance with manufacturer's written instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
 - .2 Improper installation or erection of products, due to failure in complying with requirements, authorizes the authorities having jurisdiction to require removal and reinstallation at no increase in Contract Price.
- .8 Workmanship:
 - .1 Do not employ any unfit persons or anyone unskilled in their required duties.
 - .2 Workmanship shall be best quality, executed by workers experienced and skilled in respective duties for which they are employed.
 - .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with the Architect, whose decision is final.
- .9 Co-ordination:
 - .1 Co-ordinate, organize, control and be responsible for the work of all trades until final acceptance by the Owner. Should the work be closed down for any cause, assume responsibility for its proper protection during such period.
- .10 Concealment:
 - .1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
 - .2 Before installation, inform authorities having jurisdiction if there is a contradictory situation.
- .11 Inspection:
 - .1 The Owner will have access to the work at all times
 - .2 Give timely notice when requesting inspections and coordinating the work.
 - .3 Notify appropriate agencies and the Owner in advance of any special testing or inspections required.
 - .4 Rejected work is to be removed and replaced, whether the result of poor workmanship, use of defective products or damage and whether incorporated in the work or not.

1.13 Cleaning

- .1 Clean up as work progresses and as directed by Owner.
- .2 Do not allow waste materials and debris to reach and contaminate adjacent properties or water sources.

- .3 Interior areas shall be thoroughly cleaned prior to start of finish interior work and kept free of dust and other contaminants during finishing. Wall surfaces shall be vacuumed before painting and between coats.
- .4 Upon completion of the work, remove all equipment, clear away all rubbish and surplus or waste materials remaining and leave the work in a neat and tidy condition satisfactory to the Architect.
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris. Contractor to cover costs for disposal removal and use own dumpster.
- .6 Clean and polish glass, mirrors, porcelain enamel, baked enamel, plastic laminate, mechanical and electrical fixtures, furniture, walls, floor and ceilings.
- .7 Remove stains, spots, marks, finger prints and dirt from decorative work, electrical and mechanical fixtures, furniture, walls, floors and ceilings.
- .8 Vacuum clean and dust building interiors, behind grilles, louvers, and screens.
- .9 Clean equipment and fixtures to a sanitary condition.
- .10 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds. Sweep and wash paved areas.
- .11 Clean roofs, downspouts, and drainage systems.
- .12 Remove ice and snow from building.
- .13 Ensure that cleaning agents and methods do not remove finishes and permanent protective coatings on surfaces being cleaned. Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.14 As-Built Drawings

- .1 Maintain a set of project As-Built drawings and record accurately significant deviations caused by site conditions, field changes and other changes ordered by the architect. Owner will provide any additional sets of prints required. As-built drawings are to be submitted to consultant at time of Substantial Performance.

1.15 Warranty

- .1 Warranty period for building to commence on the date of substantial performance and continue for a date of one (1) year thereafter.

1.16 References

- .1 Aluminum Association Designation System for Aluminum Finishes (AA), 1997.
- .2 American National Standards Institute/National Association of Architectural Metal Manufacturers (ANSI/NAAMM).
- .3 American Society for Testing and Materials International (ASTM).
- .4 Association of Wall and Ceilings Industries International (AWEI).
- .5
- .6 Canadian General Standards Board (CGSB).

- .7 Canadian Roofing Contractors Association (CRCA), Roofing Specifications Manual, 1997.
- .8 Canadian Sheet Steel Building Institute (CSSBI).
- .9 Canadian Standards Association (CSA International).
- .10 Factory Mutual (FM Global), FM Approvals - Roofing Products.
- .11 Health Canada/Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .12 The Master Painters Institute (MPI), Architectural Painting Specification Manual, 2004.
- .13 National Building Code of Canada (NBCC), 2010.
- .14 National Fire Code of Canada (NFCC), 2010.
- .15 National Lumber Grades Authority (NLGA).
- .16 Roofing Contractor's Association of British Columbia (RCABC), Roofing Practices Manual.
- .17 Underwriters' Laboratories of Canada (ULC).
- .18 Standards and Guidelines for the Conservation of Historic Places in Canada.

PART 2 PRODUCTS & EXECUTION

2.1 Demolition for Minor Works (02 41 99)

- .1 Site Conditions:
 - .1 If material resembling spray or trowel-applied asbestos or other designated substance be encountered, stop work, take preventative measures, and notify Consultant immediately.
 - .1 Do not proceed until written instructions have been received from Consultant.
 - .2 Notify Consultant before disrupting building access or services.
- .2 Execution:
 - .1 Inspect building and site and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
 - .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
 - .3 Notify and obtain approval of utility companies before starting demolition.
 - .4 Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.
 - .1 Immediately notify Consultant and utility company concerned in case of damage to any utility or service, designated to remain in place.
 - .2 Immediately notify the Consultant should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.
- .3 Preparation
 - .1 Protection of In-Place Conditions:
 - .1 Prevent movement, settlement, or damage to adjacent structures, utilities, landscaping features, and parts of building to remain in place. Provide bracing and shoring required.
 - .2 Keep noise, dust, and inconvenience to occupants to minimum.
 - .3 Protect building systems, services and equipment.
 - .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
 - .5 Do Work in accordance with Section 1.11 - Health and Safety Requirements
 - .2 Demolition /Removal:
 - .1 Remove items as indicated.
 - .1 Protect underlying and adjacent granular materials.
 - .2 Remove parts of existing building to permit new construction.

- .3 Trim edges of partially demolished building elements to tolerances as defined by Consultant to suit future use.
- .4 Disposal
 - .1 Progress Cleaning: clean in accordance with Section 1.15 – 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 1.15 – Cleaning.

2.2 Hazardous Materials (02 81 01)

- .1 References
 - .1 Definitions:
 - .1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.
 - .2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
 - .3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.
 - .2 Reference Standards:
 - .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
 - .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 Action and Informational Submittals:
 - .1 Submit in accordance with Section 1.9 – Submittals
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations

- .2 Submit two copies of WHMIS MSDS in accordance with Section 1.11 - Health and Safety Requirements to Consultant for each hazardous material required prior to bringing hazardous material on site.
 - .3 Submit hazardous materials management plan to Consultant that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements
- .3 Delivery, Storage and Handling:
- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions and Section 1.13 – Quality Control and Product Requirements
 - .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address
 - .3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations
 - .1 When exporting hazardous waste to another country, ensure compliance with Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulations
 - .4 Storage and Handling Requirements:
 - .1 Co-ordinate storage of hazardous materials with Consultant and abide by internal requirements for labelling and storage of materials and wastes.
 - .2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
 - .3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.
 - .4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.
 - .1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval
 - .2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Consultant
 - .5 Transfer of flammable and combustible liquids is prohibited within buildings
 - .6 Transfer flammable and combustible liquids away from open flames or heat-producing devices
 - .7 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C
 - .8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum
 - .9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled

- .10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
 - .1 Store hazardous materials and wastes in closed and sealed containers.
 - .2 Label containers of hazardous materials and wastes in accordance with WHMIS
 - .3 Store hazardous materials and wastes in containers compatible with that material or waste
 - .4 Segregate incompatible materials and wastes
 - .5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers
 - .6 Store hazardous materials and wastes in secure storage area with controlled access
 - .7 Maintain clear egress from storage area
 - .8 Store hazardous materials and wastes in location that will prevent them from spilling into environment
 - .9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment
 - .10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began
 - .11 When hazardous waste is generated on site
 - a) Co-ordinate transportation and disposal with Consultant
 - b) Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.
 - c) Use licensed carrier authorized by provincial authorities to accept subject material
 - d) Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material
 - e) Label containers with legible, visible safety marks as prescribed by federal and provincial regulations
 - f) Only trained personnel handle, offer for transport, or transport dangerous goods
 - .12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
 - .13 Report spills or accidents immediately to Consultant. Submit a written spill report to Consultant within 24 hours of incident

- .4 Products
 - .1 Materials:
 - .1 Description:
 - .1 Bring on site only quantities hazardous material required to perform Work
 - .2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials
- .5 Execution
 - .1 Cleaning:
 - .1 Progress Cleaning: clean in accordance with Section 1.15 – 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 1.15 – Cleaning.

2.3 Rough Carpentry (06 10 00)

- .1 General
 - .1 Quality Assurance
 - .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board
 - .2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards
 - .2 Products
 - .1 Framing and Structural Materials
 - .1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
 - .1 CAN/CSA-O141
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
 - .2 Framing and board lumber: in accordance with NBC.
 - .2 Panel Materials
 - .1 Plywood, OSB and wood based composite panels: to CAN/CSA-O325.0
 - .2 Canadian softwood plywood (CSP): to CSA O151, standard construction
 - .3 Interior mat-formed wood particleboard: to ANSI 208.1
 - .4 Insulating fiberboard sheathing: to CAN/CSA-A247
 - .5 Gypsum sheathing: to ASTM C 36/C36M
 - .6 VOC content with reference to Section 01 35 21
 - .3 Accessories
 - .1 Polyethylene film: to CAN/CGSB-51.34, Type 1, 0.15 mm thick

- .2 Air seal: closed cell polyurethane or polyethylene
- .3 General purpose adhesive: to CSA O112 Series
- .4 Nails, spikes and staples: to CSA B111
- .5 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
- .6 Joist hangers / connectors: minimum 1 mm thick sheet steel, galvanized ZFO01 coating designation
- .4 Fastener Finishes
 - .1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior work, interior highly humid areas, pressure preservative fire-retardant treated lumber.
- .3 Execution
 - .1 Preparation
 - .1 Store wood products.
 - .2 Installation
 - .1 Comply with requirements of NBC 2010 supplemented by following paragraphs
 - .2 Install members true to line, levels and elevations, square and plumb
 - .3 Construct continuous members from pieces of longest practical length
 - .4 Install wall sheathing in accordance with manufacturer's printed instructions
 - .5 Install roof sheathing in accordance with requirements of NBC
 - .6 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
 - .7 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work
 - .8 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners
 - .9 Install sleepers as indicated
 - .10 Use dust collectors and high quality respirator masks when cutting or sanding wood panels
 - .3 Erection
 - .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity
 - .2 Countersink bolts where necessary to provide clearance for other work
 - .3 Use nailing disks for soft sheathing as recommended by sheathing manufacturer
 - .4 Schedule
 - .1 Roof sheathing:

- .1 Plywood sheathing grade, T&G edge, thickness per structural drawings
- .2 Exterior wall sheathing
 - .1 Plywood sheathing grade, square edge, thickness per structural drawings

2.4 Board Insulation (07 21 13)

- .1 Wall/Roof Insulation Above Grade: Extruded Polystyrene (XPS) to CAN/ULC-S701, Type 2. Thickness as indicated.
 - .1 Standard of Acceptance: Styrofoam Deckmate, Deckmate Plus, and Cladmate by Dow; Foamular by Owens Corning.
 - .2 Thickness: as indicated.
 - .3 Size: 2' x 8' or 4' x 8'.
 - .4 Edges: Shiplapped for wall, Square Edge for roof
 - .5 Thermal Resistance: R-5.0/inch.
 - .6 Water Vapour Permeance: 1.5 perm-in.
 - .7 Flame/Smoke Properties: Less than 25/450, to ASTM E84.
 - .8 Mechanically fasten to wall and roof substructure.
- .2 Z-Girts: Roll-formed hot-dipped galvanized Z275 coated, minimum base thickness 1.52mm for Z-girts or as required for applied loading.
 - .1 Break Z-girts at angles, 1:12 slope off horizontal portion to allow drainage within wall cavity.
 - .2 Vertical z-girts formed by two 'L' shapes fastened with plastic thermal break spacers.
 - .3 Coat metal within drainage wall cavities with asphaltic emulsion.
 - .4 Thermal break spacers: Nylon washers 30mm diameter.
- .3 Adhesives: Type 1 recommended by insulation manufacturer for application and to CGSB 71-GP-24.
- .4 Accessories:
 - .1 Tape
 - .2 Insulation fasteners can be adhered or mechanically fastened to surfaces which are to receive board insulation
 - .3 Insulation Fasteners: Impaling clip of plastic with washer retainer and clips, to be mechanically fastened to surface to receive board insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
- .5 Execution:
 - .1 Erect z-girts to requirements of reviewed shop drawings.
 - .2 Install Z-girts vertically over air/vapour barrier membrane on exterior sheathing at 24 inch centers. Fasten through sheathing into framing using approved fasteners that penetrate a minimum of 3/4".

- .3 Install rigid insulation on outer surface of sheathing over impaling clips, on a bed of adhesive, and between Z-girts as recommended by manufacturer.

2.5 Sprayed Insulation – Polyurethane Foam (07 21 29)

.1 General

.1 Submittals

- .1 Provide submittals in accordance with Section 1.9 - Submittals
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations
 - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 2.2 - Hazardous Materials
- .3 Quality assurance submittals: submit following in accordance with Section 1.13 - Quality Control
 - .1 Test reports: submit certified test reports for insulation from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties
 - .2 Submit test reports in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics
 - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures

.2 Quality Assurance

- .1 Applicators to conform to CUFCA Quality Assurance Program
- .2 Qualifications:
 - .1 Installer: person specializing in sprayed insulation installations approved by manufacturer
 - .2 Manufacturer: company with minimum 5 years experience in producing of material used for work required for this project, with sufficient production capacity to produce and deliver required units without causing delay in work
- .3 Health and Safety Requirements: worker protection
 - .1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations
 - .2 Workers must wear protective clothing when applying foam insulation
 - .3 Workers must not eat, drink or smoke while applying foam insulation

- .3 Delivery, Storage, and Handling
 - .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section 1.13 – Quality Control and Product Requirements
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions
 - .4 Site Conditions
 - .1 Ventilate area in accordance with Section 1.11 – Health and Safety Requirements
 - .2 Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and 24 hour after application to maintain non-toxic, unpolluted, safe working conditions
 - .3 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area
 - .4 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials
 - .5 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits
- .2 Products
 - .1 Materials
 - .1 Insulation: closed cellspray polyurethane to CAN/ULC-S705.1
 - .2 Primers: in accordance with manufacturer's recommendations for surface conditions
 - .1 Maximum VOC limit 100 g/l to SCAQMD Rule 1113
- .3 Execution
 - .1 Manufacturer's Instructions
 - .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets
 - .2 Application
 - .1 Apply insulation to clean surfaces in accordance with CAN/ULC-S705.2 and manufacturer's printed instructions
 - .2 Use primer where recommended by manufacturer
 - .3 Apply sprayed foam insulation in thickness as indicated
 - .3 Cleaning
 - .1 Proceed in accordance with Section 1.15 – Cleaning
 - .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment

2.6 Air and Vapour Barrier (07 27 00)

- .1 Sheet Self-Adhesive Membrane (Wall): Self-adhesive air/vapour membrane composed of SBS modified bitumen with thermoplastic polymers and high density polyethylene film, minimal nominal total thickness of 1.1 mm (40 mils). Under surface covered with a silicone release sheet. Membrane shall have the following physical properties:
 - .1 Air Leakage: <0.0005 L/sec/sq.m. at 75 Pa pressure to ASTM E 283.
 - .2 Tested to ASTM 2357 for air barrier assembly.
 - .3 Vapour permeability: <0.03 perms to ASTM E96.
 - .4 Tensile Strength: 40 MPa minimum.
 - .5 Puncture Resistance: 178N to ASTM E154.
 - .6 Lap Peel Resistance: 2000 N/m.
 - .7 Standard of Acceptance:
 - .1 Blueskin SA or SALT as manufactured by Henry Bakor.
 - .2 Sopraseal Stick 1100T as manufactured by Soprema.
 - .3 Sopraseal 60 (heat welded) as manufactured by Soprema.
- .2 Sheet Self-Adhesive Membrane (Roof): Self-adhesive vapour barrier membrane consisting of an SBS rubberized asphalt compound integrally laminated to a woven polyethylene film.
 - .1 Vapour permeability: <1 perms to ASTM E96.
 - .2 Tensile Strength: 40 MPa minimum.
 - .3 Puncture Resistance: 178N to ASTM E154.
 - .4 Lap Peel Resistance: 1750 N/m.
 - .5 Standard of Acceptance:
 - .1 Vapor-Bloc SA as manufactured by Henry Bakor.
 - .2 Sopravap'r as manufactured by Soprema
- .3 Self-adhered Flexible Flashing:
 - .1 Acceptable products: DuPont Straightflash (VF), Typar Flashing RA, Blueskin SA, Sopraseal Stick 1100T by Soprema.
- .4 Through-wall flashing membrane:
 - .1 Standard of Acceptance: Henry Bakor Blueskin TWF, Soprema WFM.
- .5 Primers: As recommended by air/vapour barrier membrane manufacturer. Synthetic rubber based primer conforming to CGSB 37-GP-9Ma.
- .6 Sealants: Mastic sealant from membrane manufacturer, modified bitumen based caulking mastic.
- .7 Installation:
 - .1 Manufacturer's Instructions
 - .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

- .2 General
 - .1 Perform Work in accordance with National Air Barrier Association Professional Contractor Quality Assurance Program and requirements for materials and installation.
- .3 Examination
 - .1 Verify that surfaces and conditions are ready to accept work of this section.
 - .2 Ensure surfaces are clean, dry, sound, smooth, continuous and comply with air barrier manufacturer's requirements.
 - .3 Report unsatisfactory conditions to Consultant in writing.
 - .4 Do not start work until deficiencies have been corrected.
 - .5 Beginning of Work implies acceptance of conditions.
- .4 Preparation
 - .1 Remove loose or foreign matter, which might impair adhesion of materials.
 - .2 Ensure substrates are clean of oil or excess dust.
 - .3 Ensure substrates are free of surface moisture prior to application of self-adhesive membrane and primer.
 - .4 Ensure metal closures are free of sharp edges and burrs.
 - .5 Prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.
- .5 Installation
 - .1 Install materials in accordance with manufacturer's instructions.
 - .2 Self-Adhesive Transition Membrane and Sheet Membrane:
 - .1 Do not install materials in rain or snow.
 - .2 Do not install materials on wet surfaces or attempt to dry surface of materials by heating surface with a torch flame. Substrate internal moisture content must be within manufacturer's acceptable limits.
 - .3 Apply primer to surface at rate of 0.30 litres/m².
 - .4 Cover static cracks up to 3 mm in width in the substrate with a 150 mm wide membrane strip centered on the crack prior to installing the covering membrane.
 - .5 Install membrane onto primed surface by peeling back the paper backing on the underside and adhering the membrane to the surface. Apply hand pressure to the surface of the membrane to remove any trapped air beneath the membrane. Start at the center of the membrane and work toward the edges. Apply pressure with a roller to ensure perfect adhesion of the membrane to the surface.
 - .6 Shingle horizontal laps to drain. Minimum side and end laps 75 mm.
 - .7 Repair holes and tears in the membrane with a patch of membrane material. Membrane patch must exceed affected area by 100 mm minimum. Seal around edges of the patch with mastic.

- .8 Seal upper edge of membrane with mastic if rain is anticipated or if work is to be suspended more than one day.
 - .9 Install double layers of air seal membrane at outside and inside building corners, minimum 300 mm wide strips.
 - .10 At openings in walls apply self-adhesive membrane over sloped sill framing and carry up side jamb openings 300 mm. At corners of openings install 300 mm square membrane reinforcing diagonal to the corner, stretch and fit tight to framing. Apply the membrane on the sill first. Apply corner stripping at jambs second. Apply jamb membrane last.
 - .11 Lap and seal air barrier membrane over through-wall flashing at base of wall and at all horizontal wall flashings.
 - .12 Lap roof membrane flashing over air barrier membrane at parapets and seal.
 - .13 Seal all through-wall and roof equipment flanges with air barrier membrane flashing strips; apply mastic to edges.
 - .14 Seal all metal fabrication flanges with air barrier membrane flashing strips; apply mastic to edges.
 - .15 Seal all horizontal drip flashings to air barrier membrane with minimum 150 mm strips of transition membrane flashing applied horizontally, lap and shingle transition membrane into air barrier membrane; apply mastic to edges of flashing membrane.
 - .16 Install the air/vapour membrane to create a continuous seal at construction elements and at junctions of different materials or construction types.
 - .17 Self-tapping screws to be used if mechanical attachment of insulation is conducted. Use insulation clips or stick pins
- .6 Apply sealant within recommended application temperature ranges.
 - .1 Consult manufacturer when sealant cannot be applied within these temperature ranges.

2.7 SBS Membrane Roof (07 52 00)

- .1 Products:
 - .1 Prefabricated membrane to comply with CAN/CGSB 37-GP-56M.
 - .2 Membrane Roofing
 - .1 Soprema Sopraply system (heat-welded two-ply).
 - .1 Base Sheet: Sopraply Base 510/520 by Soprema.
 - .2 Cap Sheet: Sopraply Cap 550 by Soprema.
 - .3 Flashing Base Sheet: Sopraflash Flam Stick.
 - .4 Flashing Cap Sheet: Sopraply Traffic Cap 560
 - .5 Flashing and Trim: in accordance with "Sheet Metal Flashing and Trim" and as shown on Contract Drawings.
 - .6 Warranty: The membrane manufacturer will issue a written document in the owner's name, valid for a 10-year period, saying that it will repair any leaks in the roofing membrane to restore the roofing system to a dry and watertight

condition, to the extent that membrane manufacturing or installation defects caused water infiltration. The warranty must cover for the entire cost of the repair(s) during the entire warranty period. The warranty must be transferable, at no extra cost, to subsequent building owners. The contractor will issue a written and signed document in the owner's name, certifying that the work executed will remain in place and free of any workmanship defect for a period of 10 years, starting from the date of acceptance.

- .2 Execution:
 - .1 Do membrane application in accordance with manufacturer's instructions.
 - .2 Roof penetrations: Install vent stack covers and other roof penetration flashings and seal to membrane in accordance with the manufacturer's recommendations and details.
 - .3 Environmental Requirements: Do not install when temperature remains below -18 deg. C for torch application. Min. temperature for solvent based adhesive is -5 deg. C. Apply only during weather that will not introduce moisture into roofing system.
 - .4 Do roofing work in accordance with applicable standard in Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual.
 - .5 Base sheet application: Starting at low point on roof, unroll base sheet (parallel to roof edge). Torch base sheet entirely onto prepared substrate. Overlap side laps by 3" along lines provided for this purpose, and overlap end laps by 6". Stagger end joints by a minimum of 12". Torch sufficiently and continuously to avoid wrinkles, air pockets or fishmouths. In cold weather, adjust welding time to obtain homogenous seam (it may be necessary to slow down in certain cases.) Cut off corners at end laps to be covered by the next roll.
 - .6 Cap sheet application: Starting at low point in roof, unroll and torch cap sheet onto base sheet, taking care not to burn membrane. Lap sheets 3" min. for side laps, 6" min. for end laps. Offset joints in cap sheet 12" min from those in base sheet.
 - .7 Once base sheet is applied and no defects are apparent, proceed with cap sheet installation. Begin with double-selvage starter roll. If starter roll is not used, side laps covered in granules must be degranulated by embedding side laps in torch-heated bitumen over a 3" width. Starting at low point in roof, unroll cap sheet. Carefully align first side lap (parallel to roof edge). Weld cap sheet onto base sheet with torch recommended by membrane manufacturer. During application, simultaneously melt both designated contact surfaces so a bead of bitumen is apparent as cap sheet unrolls. Avoid overheating. Make sure joints between the two layers are staggered by at least 12". Overlap cap sheet side laps by 3". and end laps by 6". Cut off corners at end laps to be covered by next roll. All overlap surfaces must be degranulated. Complete perfect welds between two membranes. Leave no zone unwelded. In cold weather, adjust welding time to obtain homogenous seam (it may be necessary to slow down in certain cases.) Once cap sheet is installed, carefully check all overlapped joints.
 - .8 Flashings: Install flashing base sheet stripping prior to installing membrane cap sheet. Mechanically fasten base sheet and torch cap sheet onto substrate in 38" wide strips. Lap flashing base sheet to membrane base sheet 6" min. and

seal. Lap flashing cap sheet to membrane cap sheet 10" min. and torch weld. Provide 3" min. side lap and seal.

- .9 Application to be free of sags, blisters, wrinkles and fish mouths.

2.8 Sheet Metal Flashing and Trim (07 62 00)

- .1 Galvalume Sheet Steel: fabricated from Aluminum-zinc alloy coated steel sheet: to ASTM A792/A792M, commercial quality, grade 33 with AZ180 coating, 22 gauge base metal thickness.
 - .1 Locations: As indicated on drawings.
- .2 Pre-finished Sheet Steel: fabricated from Aluminum-zinc alloy coated steel sheet: to ASTM A792/A792M, commercial quality, grade 33 with AZ150 coating, 24 gauge base metal thickness.
 - .1 Finish: Factory applied silicone modified polyester (SMP). Top side dry film thickness minimum 20 microns.
 - .2 Colour: Galvalume
- .3 Accessories:
 - .1 Isolation coating: alkali resistant bituminous paint.
 - .2 Sealants: UV resistant one part polyurethane, colour to match adjacent surface.
 - .3 Clips or Cleats: of same material, and temper as sheet metal, minimum 2" wide. Thickness same as sheet metal being secured.
 - .4 Fasteners and washers: to RCABC standards.
 - .5 Solder: to ASTM B32.
 - .6 Flux: rosin, cut hydrochloric acid, or commercial preparation suitable for materials to be soldered.
 - .7 Touch up paint: as recommended by prefinished material manufacturer.
 - .8 High-Temperature Underlay Membrane: Self-adhering high temperature membrane complete with compatible primer and sealant. Acceptable product, Soprema Lastobond Shield HT, Bakor Blueskin PE 200HT, or acceptable substitution.
- .4 Fabrication:
 - .1 Fabricate metal flashings and other sheet metal work to applicable SMACNA and RCABC standards using S-Lock and standing seam connections.
 - .2 Make allowance for expansion at joints.
 - .3 Hem exposed edges on underside 3/4". Miter and seal corners with sealant.
 - .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
 - .5 Fabricate curved or radius sections of flashing and trim to suit radius and or curve indicated.
 - .6 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

- .5 Flashings:
 - .1 Roof and walls: Form flashings to profiles indicated.
 - .2 Form joints of all horizontal and sloping cap flashings with standing seam joints.
- .6 Execution:
 - .1 Comply with manufacturer's written recommendations for storage and installation.
 - .2 Install sheet metal work as detailed to RCABC Standards.
 - .3 Use concealed fastenings except where approved before installation.
 - .4 Counter-flash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock seams forming tight fit over hook strips.
 - .5 Lock end joints and caulk with sealant.
 - .6 Install surface mounted reglets true and level, and caulk top of reglet with sealant.
 - .7 Insert metal flashing into reglets and under cap flashing to form weather-tight junction.
 - .8 Caulk flashing at reglets and cap flashing with sealant.
 - .9 Install curbs and flashings, around items projecting through roof.
 - .10 Install base metal flashing on all vertical surfaces, walls, curbs etc where hot asphalt is used to adhere flashing membranes.
 - .11 Make all roof areas watertight. Flash openings and other items projecting through roofing. Bend up flashing as required, fold and clip neatly and secure in straight lines free from wrinkles and undulations.
 - .12 Ensure wide girth flashings are adequately sloped to the inside of roof areas and do not pond water. Back-sloped flashings will be rejected by the Architect. Fastenings to be concealed and watertight. Carefully place, form and trim breaks. Bond and neutralize soldering.
 - .13 Turn back edges of all exposed flashing to form 1/4" stiffeners.
 - .14 Keep all metal drip flashings a minimum of 4" above all roof surfaces.
 - .15 Install flashing in maximum 8' lengths, to profiles indicated.
 - .16 Construct internal and external mitres with properly shaped capping pieces.
 - .17 Form all flashing on a bending brake. Execute all hand trimming, shaping and soldering with appropriate tools. Install with hold down clips.
 - .18 Allow for expansion and contraction to finished work without deformation.
 - .19 Neutralize all acid flux before painting.
 - .20 Slope all horizontal wall flashings minimum 2% slope to exterior.
 - .21 Form 2" end dams for all wall flashings and at openings.

2.9 Roof Anchors and Safety Restraints (07 72 69)

- .1 General:
 - .1 Summary: Manufacturer to design and provide complete engineering for permanent fall arrest and restraint anchors, equipment supports and provide required engineering information to the Architect to enable complete design of the building structure and reinforcements not part of this Section.
 - .2 Regulatory Requirements: Conform to Worker's Safety and Compensation Commission of Yukon regulations for Fall Protection.
- .2 Products:
 - .1 Exposed structural units: Stainless steel, type 304, 290 MPa (42 ksi) yield strength. Single insert: Cast stainless steel, Type 304.
 - .2 Anchor pedestal to be Schedule 40 pipe, hollow structural steel section and base plate assembly to be hot-dipped galvanized to CSA-G164.
 - .3 Attachment rings and other hardware: in accordance with ASTM F887; drop forged or fabricated, 22.2 kN (5,000 lb-force)-force proof load.
 - .4 Fasteners: Stainless steel type 304 or better, lock-nut washers and hex nuts. Drilled anchor bolts, stainless steel type 304 inserts with HVA adhesive by Hilti Canada Ltd.
 - .5 Mild Steel: to CSA-G40.21, Type W, yield strength 350 MPa for HSS, 300 MPa for plates and other sections.
 - .6 Cold Rolled Steel: to CSA-S136, yield strength 380 MPa, tensile strength 460 MPa.
 - .7 Welding Materials: to CSA-W59 by welders qualified to CSA-W47.1.
 - .8 Flashing: Pre-finished stainless steel flashing cap.
 - .9 Joint Sealants: Non-skinning butyl sealant where not exposed to UV or neutral curing silicone sealant.
 - .10 Fabrication:
 - .1 Weld and grind smooth all connection to CWB requirements. Fabricate for roof and deck mounting.
 - .2 Size uprights for minimum 8" exposure above roof membrane to RCABC good roofing practices.
 - .3 Fabricate seamless flashing where metal pier anchors are used. Use one piece stainless steel cap at the top of pier anchors.
- .3 Execution:
 - .1 Install safety anchors in accordance with manufacturer's written instructions under the supervision of a qualified structural engineer registered in the Yukon and employed by the manufacturer.
 - .2 Provide field inspection and testing upon completion by manufacturer's technical representative and note deficiencies in written report to Architect.
 - .3 Notify Owner of attachments, harnesses, equipment and personal safety items, not forming part of the permanent installation specified in this Section, but are required for a properly executed roof safety and rooftop maintenance system.

2.10 Fire- Stopping (07 84 00)

- .1 Fire Stop System Rating:
 - .1 For penetrations through a fire wall or horizontal fire separation provide a fire-stop system with a 'FT' rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.
 - .2 For combustible pipes, tubing, ducts, chimneys, optical fiber cables, electrical wires and cables, totally enclosed non-combustible raceways, electrical outlet boxes and similar building services that penetrate through a fire separation provide a fire-stop system with a 'F' Rating as determined by ULC or cUL as indicated below:

Separation Fire Resistance Rating	Fire-stopping Required ULC or cUL 'F'
.1 30 minutes	20 minutes
.2 45 minutes	45 minutes
.3 1 hour	45 minutes
.4 1.5 hours	1 hour
.5 2 hours	1.5 hour
.6 3 hours	2 hours
- .2 For combustible pipe penetrations through a fire separation provide a fire-stop system with a 'F' Rating as determined by ULC or cUL (when tested with a pressure differential of 50 Pa between exposed and unexposed sides) which is equal to the fire resistance rating of the construction being penetrated.
 - .1 For joints provide a fire-stop system with an Assembly Rating as determined by CAN4-S115-M, ULC-S115-M or UL 2079 which is equal to the fire resistance rating of the construction being penetrated.
- .3 Manufacturers:
 - .1 Subject to compliance with through penetration fire-stop systems and joint systems listed in the ULC Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory, provide products of the following acceptable manufacturers:
 - .1 A/D Firebarrier
 - .2 3M Fire Protection Products.
 - .3 Hilti (Canada) Limited.
 - .4 Tremco Sealants & Coatings.
 - .5 Other manufacturers listed in the above noted reference Standards.
- .4 Accessories:
 - .1 Fiber Insulation: Alumina-silica refractory fiber insulation in blanket or bulk form with service temperature limit of 1315 degrees C, melting point of more than 1760 degrees C, specific gravity 2.56, thickness to suit application.
 - .2 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
 - .3 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

- .4 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .5 Sealants for vertical joints: non-sagging.
- .5 Installation:
 - .1 Comply with manufacturer's storage and installation instructions.
 - .2 Install fire stopping and smoke seal material and components in accordance with ULC and cUL Certification and manufacturer's instructions.
 - .3 Seal holes or voids made by through penetrations, poke through termination devices, and un-penetrated openings or joints to ensure continuity and integrity of fire separation are maintained by providing an air and water resistant seal..
 - .4 Consult with related trades before installation of ULC or cUL fire-stop systems that might hamper the performance of fire dampers in duct work.
 - .5 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
 - .6 Tool or trowel exposed surfaces to neat finish.
 - .7 Remove excess compound promptly as work progresses and upon completion.
 - .8 Protect materials from damage on surfaces subjected to traffic.
- .6 Schedule:
 - .1 Acceptable substitution product listed in the ULC Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory.
 - .2 Sealants or caulking materials for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT):
 - .1 3M Fire Stop Sealant 2000.
 - .2 3M Fire Barrier CP25 WB.
 - .3 Hilti FS-One Intumescent Firestop Sealant.
 - .4 Hilti FS 604 Self Levelling Firestop Sealant.
 - .5 Tremco Tremstop Fyre-Sil Sealant.
 - .3 Sealants or caulking materials for use with sheet metal ducts:
 - .1 Hilti CP 601s Elastomeric Firestop Sealant.
 - .2 Hilti CP 606 Flexible Firestop Sealant.
 - .3 Hilti FS-One Intumescent Firestop Sealant.
 - .4 Hilti FS 604 Self Leveling Firestop Sealant.
 - .4 Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps:
 - .1 3M Firestop Sealant 2000.
 - .2 Hilti CP 672 Firestop Spray.
 - .3 Hilti CP 601s Elastomeric Firestop Sealant.
 - .4 Hilti CP 606 Flexible Firestop Sealant.
 - .5 Hilti FS 604 Self Leveling Firestop Sealant.
 - .6 Tremco Tremstop Fyre-Sil Sealant.

- .5 Intumescent sealants or caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed flexible cable or cable bundles and plastic pipe:
 - .1 3M Fire Barrier CP25 WB.
 - .2 Hilti Fs-One Intumescent Firestop Sealant.
 - .3 Tremco Tremstop WBM Intumescent Firestop Sealant.
- .6 Intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles:
 - .1 3M Fire Barrier CP25 WB.
 - .2 Hilti FS-One Intumescent Firestop Sealant.
 - .3 Hilti CP 618 Firestop Putty Stick.
 - .4 Tremco Tremstop WBM Intumescent Firestop Sealant.
- .7 Non-curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles:
 - .1 Hilti CP 618 Firestop Putty Stick.
- .9 Wall opening protective materials for use with cUL/ULC listed metallic and specified nonmetallic outlet boxes:
 - .1 Hilti CP 617 Firestop Putty Pad.
 - .2 Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems) tested to 50 Pa differential:
 - .3 3M Fire Barrier PPD Plastic Pipe Device.
 - .4 Hilti CP 642 or CP 643 Firestop Collar.
- .10 Materials for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways:
 - .1 3M Firestop Foam 2001.
 - .2 3M Fire Barrier CS-195 Composite Sheet.
 - .3 Hilti FS 635 Trowelable Firestop Compound.
 - .4 Hilti FS 657 Fire Block.
- .11 Non-curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways:
 - .1 Hilti FS 657 Fire Block.
- .12 Sealants or caulking materials used for openings between structurally separate sections of wall and floors:
 - .1 3M Fire Barrier CP 25 WB.
 - .2 Hilti CP 672 Firestop Spray.
 - .3 Hilti CP 601s Elastomeric Firestop Sealant.
 - .4 Hilti CP 606 Flexible Firestop Sealant.
 - .5 Hilti FS 604 Self Leveling Firestop Sealant.

2.11 Joint Sealants (07 92 00)

- .1 Sealant materials:
 - .1 Type 1: Multi-component, polyurethane sealant. To meet specified requirements of CGSB specification CAN/CGSB-19.24-M90, Type 2, Class B. Use at all locations, except where another type is specified. Acceptable product, Dymeric 240, Dymeric 240 FC by Tremco Ltd., Sikaflex 2c.
 - .2 Type 2: Medium modulus, moisture curing, one part silicone sealant. Meeting the specified requirements of specification CAN/CGSB-19.13-M87, Classification MCG-2-25-A-L. Use in glass to glass, glass to metal and metal to metal curtainwall joints and sheet metal roofing. Acceptable material, Dow 791 or 795, Spectrem 2 by Tremco Ltd.
 - .3 Type 3: Mildew resistant, one component neutral cure silicone sealant. Meeting the specified requirements of specification CGSB-19GP22M. Use on fixtures, bathtubs and vanity tops, clear elsewhere. Acceptable product, Tremsil 600 white or clear by Tremco Ltd.
 - .4 Type 4: One component, paintable acrylic latex sealant. Meeting the specified requirements of specification CGSB-19-GP-17M. Use in interior non-moving joints that may be painted. Acceptable product, Tremflex 834 by Tremco Ltd.
 - .5 Type 5: Ultra low modulus, one component, moisture curing silicone sealant. Use for moving joints. Acceptable product, Spectrem 1 by Tremco Ltd.
 - .6 Type 6: One-part moisture curing polyurethane sealant. Acceptable product Vulkem 116. Use in tile work expansion joints, vertical and horizontal.
- .2 Colours of sealant to be selected by the Consultant from the range of manufacturer's standard colours.
- .3 Joint Cleaner: Xylol, methylethyleketon or non-staining and non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.
- .4 Primers: Type recommended by sealant manufacturer.
- .5 Joint Fillers:
 - .1 General: Compatible with primers and sealants, oversized 30 to 50%.
 - .2 Polyethylene, Urethane, Neoprene or Vinyl: Extruded closed cell foam Shore A, hardness 70, tensile strength 138 to 207 kPa. (20 to 30 psi).
 - .3 Joint backing material vertical surfaces (excluding EIFS) - Sof Rod an extruded polyolefin foam by Tremco Ltd.
 - .4 Joint backing horizontal surfaces and EIFS surfaces - Standard Backer Rod, a closed cell polyethylene foam by Tremco Ltd.
- .6 Bond breaker, where joint configuration does not allow for proper depth/width ratio place a pressure sensitive plastic tape at the back of the joint that will not bond to the sealant such as 3M #226 or #481 or Valley Industries #40.
- .7 Adhesives, sealants and sealant primers VOC content to comply with content limits of South Coast Air Quality Management District (SCAQMD) Rule #1168.
 - .1 Architectural Sealant Primers:
 - .1 Non-Porous: 250 g/L
 - .2 Porous: 775 g/L

.2 Architectural Sealants: 250 g/L

.8 Execution:

.1 Preparation:

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants. Maintain depth of sealant at middle of joint width as follows:

Joint Width	Sealant Depth	Joint Depth
6 mm	6 mm	10 mm
20 mm	10 mm	15 mm
32 mm	13 mm maximum	20 mm

*Minimum adhesion surface to be 1.5 times depth.

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

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

.4 Ensure joint surfaces are dry and frost free.

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

.2 Priming: Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking. Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

.3 Backup Material: Apply bond breaker tape where required to manufacturer's instructions. Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

.4 Mixing: Mix materials in strict accordance with sealant manufacturer's instructions.

.5 Sealant: Apply sealant in accordance with manufacturer's written instructions.

.6 Locations:

.1 Caulk all joints where indicated on the drawings and at all locations where required to provide a complete weather-tight building.

.2 Install sealants in all locations shown on drawings.

.3 Install sealant at the perimeter of all exterior openings where doors, windows, grilles and other items abut or penetrate the exterior wall materials.

.4 Install sealant at all door saddles, spread a bead of sealant compound over entire seat of saddles at least 3 mm thick before installing saddle.

.5 Seal the junctions of differing exterior wall materials.

.6 Provide a minimum of two continuous beads of sealant under all prefinished or galvanized steel wall flashings.

.7 Curing.

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

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

2.12 Skylights (08 60 00)

- .1 Products: Fixed Aluminum Curb Mounted Glass Skylight.
- .1 Standard of Acceptance: 2000 Series Aluminum Skylight as manufactured by Kawneer Company
 - .2 Type: Ridge Skylight with Vertical Gable, and Single Slope Skylight
 - .3 Base Frame: ASTM B 221; 6063-T6 alloy and temper
 - .4 Finish: Kawneer Permanodic® AA-M10C22A31, AAMA 611, Architectural Class II Clear Anodic Coating (Color #17 Clear)
 - .5 Glazing: LoE³-366 Triple Glazed.
 - .6 Rough Opening: to be confirmed by Contractor on site
 - .7 Fasteners: Exterior fasteners to be stainless steel.
 - .8 Gaskets: Interior glazing gaskets shall comply with ASTM C 864 and be extruded of a silicone compatible EPDM rubber. Exterior glazing gaskets to be Tremco Visionstrip®.
 - .9 Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
 - .10 Thermal Barrier: Thermal separator shall be extruded of a silicone compatible PVC (Poly Vinyl Chloride).
 - .11 Warranty: Provide manufacturer standard 20 year warranty against insulating glass failure and 10 year warranty against manufacturers' material or workmanship defects.
- .2 Execution:
- .1 Install skylight in accordance with CAN/CGSB-63.14 and manufacturer's installation instructions.
 - .2 Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive skylight system and sill plate is level in accordance with manufacturer's acceptable tolerances.
 - .1 Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays
 - .3 Ensure skylight is securely sealed and fastened to site built curb.
 - .4 Erect components plumb, level and in proper alignment
 - .5 Ensure continuity of envelope air barrier and vapour retarder systems
 - .6 Adjust and seal assembly with provision for expansion and contraction of components
 - .7 Sheet Air and Vapour Barrier:
 - .1 Equip window frames with site installed air barrier and vapour barrier material for sealing to building air barrier and vapour barriers.

- .2 Material: identical to, or compatible with, building air barrier and vapour retarded materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.
- .3 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier from interior.
- .8 Seal joints between windows and window sills with sealant. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills. Apply sealant to standard building practice and as per drawings. Conceal sealant within window units except where possible.
- .9 Seal joints between windows and adjoining gypsum wallboard terminations (j-bead) and between windows and window sills with white silicone caulking. Properly mask joints before caulking and tool joint immediately with tool of proper shape to achieve the narrowest neat joint possible.
- .10 Conceal sealant within window units except where exposed use is permitted by Consultant.
- .11 Subsequent to installation of the skylight, the contractor shall be responsible for the cleanup and protection of all materials provided per this section, including glazing materials and framing members. No abrasive materials of any kind shall be used in cleaning of skylight surfaces.

2.13 Painting (09 91 00)

- .1 Qualified products: only paint materials listed on the MPI Qualified Products List are acceptable for use on this project.
- .2 All interior paints must be products meeting MPI "Environmentally Friendly" E3 rating based on VOC content levels.
- .3 Paint materials: to MPI Standards listed in Finishing Formula.
- .4 Paint materials for each coating formula to be products of a single manufacturer.
- .5 Colour: as specified by the architect
- .6 Prepare wood surfaces to CGSB 85 GP 1M.
 - .1 Use CAN/CGSB 1.126 vinyl sealer over knots resinous areas.
 - .2 Apply wood paste filler to nail holes and cracks.
 - .3 Tint filler to match stains for stained woodwork.
- .7 Prepare wallboard surfaces to CGSB 85 GP 33M. Fill minor cracks with plaster patching compound.
- .8 Sand and dust between each coat to remove defects visible from distance up to 5 feet.
- .9 Apply paint to exposed gypsum board areas only.
- .10 Paint all exposed miscellaneous metals, structural steel components, conduits, pipes, hangers and other mechanical and electrical equipment occurring in finished (visible) areas. Colour and texture to match adjacent surfaces and as specified by Architect, except as noted otherwise.
- .11 Leave name plates unpainted.
- .12 INT.9.2B High Performance Architectural Latex: for gypsum board walls and ceilings apply:

- .1 two coats semi-gloss HIPAC latex, MPI#138, 139, 140, 141: E2 or E3 only.
- .2 one-coat Latex primer sealer MPI#50: E2 or E3 only.
- .13 Match paint colour to existing.