



**SMITHERS REGIONAL AIRPORT  
TERMINAL UPGRADE AND EXPANSION**

TOWN OF SMITHERS BC  
SMITHERS CONTRACT NUMBER 2017-11

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**INVITATION TO BID-TENDER FORM  
&  
SPECIFICATIONS**

**ISSUED FOR CONSTRUCTION  
AUG/09/2017**

NOTE  
ALL ITEMS IN THESE DOCUMENTS WITH RED FONT  
INDICATE CHANGES FROM TENDER DOCUMENTS BY ADDENDUM





**INVITATION TO TENDER**

**FOR**

**AIR TERMINAL UPGRADE AND EXPANSION  
SMITHERS REGIONAL AIRPORT  
SMITHERS BC**

ISSUED FOR TENDER APRIL 11 2017  
ISSUED FOR CONSTRUCTION AUG/09/2017

**SMITHERS CONTRACT NUMBER**  
**2017-11**

**CLOSING: MAY 24, 2017 (Add 5)**

**at 14:00 PM Pacific Local Time**

**NOTE**

**ALL ITEMS IN THESE DOCUMENTS WITH RED FONT  
INDICATE CHANGES FROM TENDER DOCUMENTS BY ADDENDUM**

**BIDDER/CONTRACTOR:** \_\_\_\_\_

**SIGNING:** \_\_\_\_\_

## **LIST OF TENDER DOCUMENTS**

### *LIST OF DRAWINGS*

*ALL DOCUMENTS AS ISSUED FOR TENDER ON APRIL 11 2017*

*AS ISSUED FOR CONSTRUCTION*

## **ARCHITECTURAL DRAWINGS ISSUED FOR TENDER APRIL 11 2017**

A0.00 - TITLE SHEET  
A0.01 - GENERAL NOTES & LOCATION PLAN  
A0.02 - CODE COMPLIANCE AND EXITING PLAN  
A0.03 - CONSTRUCTION ASSEMBLIES  
A1.01 - SITE PLANS  
A1.02 - PHASING PLANS  
A1.03 - DEMOLITION FLOOR PLANS  
A1.04 - DEMOLITION ROOF AND CEILING PLANS  
A2.01 - BASEMENT PLAN  
A2.02 - LEVEL 1 FLOOR PLAN  
A2.03 - ROOF PLAN  
A2.04 - REFLECTED CEILING PLANS  
A3.01 - BUILDING ELEVATIONS  
A4.01 - BUILDING LONG SECTIONS  
A4.02 - BUILDING CROSS SECTIONS  
A5.11 - SECTION DETAILS  
A5.12 - SECTION DETAILS  
A6.01 - WASHROOM DETAILS  
A7.01 - INTERIOR ELEVATIONS  
A7.02 - CLT WALL AND ROOF ELEVATIONS AND PLANS  
A8.01 - WINDOW & DOOR SCHEDULE  
A8.02 - WINDOW & DOOR SCHEDULE  
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S2.1 - FOUNDATION PLAN  
S2.2 - LEVEL 1 FRAMING PLAN  
S2.3 - LOW ROOF FRAMING PLAN  
S2.4 - HIGH ROOF FRAMING PLAN  
S3.1 - BUILDING SECTIONS  
S3.2 - BUILDING SECTIONS  
S3.3 - BUILDING SECTIONS  
S4.1 - SECTIONS AND DETAILS  
S4.2 - SECTIONS AND DETAILS  
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## **LIST OF TENDER DOCUMENTS (2<sup>ND</sup> PAGE)**

### *LIST OF DRAWINGS*

*ALL DOCUMENTS AS ISSUED FOR TENDER ON APRIL 11 2017*

*AS ISSUED FOR CONSTRUCTION*

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M002 - GEOEXCHANGE FIELD  
M101 - CRAWLSPACE - DEMO HVAC  
M102 - LEVEL 1 - DEMO HVAC  
M103 - ROOF - DEMO HVAC  
M104 - CRAWLSPACE - DEMO PLUMBING  
M105 - LEVEL 1 - DEMO PLUMBING  
M106 - ROOF - DEMO PLUMBING  
M201 - CRAWLSPACE - HYDRONICS  
M202 - LEVEL 1 - HYDRONICS  
M211 - CRAWLSPACE - HVAC  
M212 - LEVEL 1 - HVAC  
M213 - ROOF - HVAC  
M221 - CRAWLSPACE - PLUMBING  
M222 - LEVEL 1 – PLUMBING  
M223 - ROOF - PLUMBING  
M231 - CRAWLSPACE - FIRE PROTECTION  
M232 - LEVEL 1 - FIRE PROTECTION  
M241 - EXISTING MECHANICAL ROOM  
M242 - NEW MECHANICAL ROOM  
M251 - WASHROOM LAYOUT  
M300 - VENTILATION SCHEMATIC  
M301 - HYDRONICS SCHEMATIC  
M302 - FIRE PROTECTION & WATER ENTRY SCHEMATIC  
M400 - EQUIPMENT SCHEDULE  
M401 - EQUIPMENT SCHEDULE  
M500 - DETAILS-1  
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E1.01 – SCHEDULES  
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E2.00 – MAIN AND CRAWLSPACE LIGHTING LAYOUT  
E2.01 – MAIN AND CRAWLSPACE POWER AND SYSTEMS LAYOUT  
E3.00 – DEMO MAIN AND CRAWLSPACE LIGHTING LAYOUT  
E3.01 – DEMO MAIN AND CRAWLSPACE POWER AND SYSTEMS LAYOUT

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C2: SITE PLAN  
C3: DETAILS AND NOTES

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*LIST OF SPECIFICATIONS SECTIONS*

*AS ISSUED FOR CONSTRUCTION JULY 26 2017*

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01 11 00 Summary of Work	2
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01 14 00 Work Restrictions Terminal	4
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01 25 00 Contract Modification Procedures	4
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01 32 00 Construction Progress Documentation	2
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01 60 00 Product Requirements	2
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01 82 00 Demonstration and Training	2
<b>DIVISION 2</b>	
02 41 19 Selective Demolition	3
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02 83 00 Lead Removal (read with hazmat report attached)	3
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03 33 31 Cast In Place Architectural Concrete	5
03 35 10 Concrete Floor Finishing	5
<b>DIVISION 5</b>	
05 50 00 Metal Fabrications	4
<b>DIVISION 6</b>	
06 11 00 Wood Framing	3
06 15 43 Cross Laminated Timber	5
06 41 11 Architectural Millwork	9
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07 11 13 Bituminous Damp-proofing	3
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07 26 00 Vapour Retarders	3
07 27 00 Air Barriers	3
07 42 13 Metal Wall Panels	5

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07 54 19	Thermoplastic Membrane Roofing	19
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08 14 16	Flush Wood Doors	5
08 33 25	Rollup Steel Doors	6
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08 44 13	Glazed Aluminum Systems	11
08 44 33	Sloped Glazing (section deleted pta-1)	
08 51 13	Aluminum Windows (section added)	6
08 71 00	Finish Hardware (section replaced)	12
08 71 73	Automatic Door Operators (section added)	5
08 80 50	Glass and Glazing	6

### DIVISION 9

09 21 16	Gypsum Board Assemblies	7
09 22 16	Metal Support Systems	7
09 30 13	Ceramic Tile	7
09 51 00	Acoustic Tile Ceiling	5
09 65 10	Resilient Flooring	7
09 68 13	Carpet Tile	7
09 91 10	Painting	6

### DIVISION 10

10 21 13	Toilet Partitions	4
10 28 14	Toilet and Bath Accessories	5
10 44 13	Fire Extinguishers and Cabinets	3

### DIVISION 12

12 49 20	Motorized Roller Shades (section deleted pta-1)	
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### DIVISION 14

14 54 00	Baggage Claim and Conveyors	9
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21 05 06	Common Work Results for Fire Suppression	8
21 05 33	Heat Tracing for Fire Suppression Piping	2
21 05 53	Identification of Fire Suppression Piping and Equipment	1
21 05 95	Testing, Adjusting and Balancing for Fire Suppression	1
21 07 19	Fire Suppression Piping Insulation	1
21 08 00	Commissioning of Fire Suppression	1
21 13 00	Fire Suppression Sprinkler Systems	11
21 25 00	Fire Extinguishers	2

### DIVISION 22 PLUMBING

22 05 00	Common Work Results for Plumbing	9
22 05 13	Common Motor Requirements for Plumbing Equipment	1
22 05 20	Thermometers and Pressure Gauges for Plumbing	1

22 05 29	Hangers and Supports for Plumbing Piping and Equipment	1
22 05 33	Heat Tracing for Plumbing Piping	2
22 05 48	Vibration Isolation for Plumbing Piping Equipment	1
22 05 49	Seismic Restraint Systems for Plumbing Piping and Equipment	1

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22 05 93	Testing, Adjusting and Balancing for Plumbing	1
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22 08 00	Commissioning of Plumbing	1
22 11 00	Facility Water Distribution and Equipment	17
22 13 00	Facility Sanitary Sewerage and Storm Drainage Systems	4
22 16 00	Facility Natural Gas Piping	5
22 40 00	Plumbing Fixtures and Trim	3

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23 05 14	Variable Speed Drives	6
23 05 16	Expansion Fittings and Loops for HVAC Piping	4
23 05 19	Meters for HVAC Piping	2
23 05 20	Thermometers and Pressure Gauges	4
23 05 29	Hangers and Supports for HVAC Piping and Equipment	4
23 05 33	Heat Tracing for HVAC Piping	6
23 05 48	Vibration Isolation for HVAC Piping and Equipment	7
23 05 49	Seismic Restraint Systems for HVAC Piping and Equipment	3
23 05 53	Identification for HVAC Piping and Equipment	5
23 05 93	Testing, Adjusting and Balancing for HVAC	9
23 07 13	Duct Insulation	7
23 07 16	HVAC Equipment Insulation	6
23 07 19	HVAC Piping Insulation	12
23 08 00	Commissioning of HVAC Systems	3
23 21 13	Hydronic Piping, Valves and Fittings	16
23 21 14	Hydronic Specialties	7
23 21 15	Ground Source Heat Exchanger	13
23 21 23	Hydronic Pumps	5
23 25 00	HVAC Water Treatment	4
23 31 00	HVAC Ducts and Casings	8
23 33 00	Air Duct Accessories	8
23 34 00	HVAC Fans	5
23 36 00	Air Terminal Units	3
23 37 00	Air Outlets and Inlets	3
23 41 00	Particulate Air Filtration	3
23 51 00	Breeching Chimneys and Stacks	3
23 52 00	Heating Boilers	4
23 57 00	Hydronic Heat Exchangers for HVAC	1
23 72 00	Air-to-Air Energy Recovery Equipment	4
23 73 10	Air Handling Units – Commercial	7
23 81 10	Packaged Heating and Cooling Equipment	3
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25 05 01	Integrated Automation (Direct Digital Controls)	21
25 30 01	BACnet Controls	12
25 90 01	Systems Sequences of Operation	13
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26 05 00	Common Work Results – Electrical	14
26 05 01	Seismic Restraints - Electrical	4
26 05 03	Electrical Systems Commissioning	5
26 05 10	Firestopping	4
26 05 12	Demolition Work - Electrical	4
26 05 20	Wire and Box Connectors - 0-1000 V	1
26 05 21	Wires and Cables - 0-1000 V	4
26 05 22	Connectors and Terminations	1
26 05 28	Grounding – Secondary	2
26 05 31	Splitters, Junction, Pullboxes and Cabinets	2
26 05 32	Outlet Boxes Conduit Boxes and Fittings	2
26 05 34	Conduits, Conduit Fastenings and Fittings	5
26 12 17	Dry Type Transformers up to 600V Primary	2
26 24 16	Panelboards Breaker Type	3
26 27 26	Wiring Devices	3
26 27 51	Hand Dryers	1
26 28 21	Moulded Cases Circuit Breakers	1
26 28 23	Disconnect Switches - Fused and Non-Fused	1
26 29 10	Motor Starters to 600 V	3
26 50 00	Lighting	3
26 53 00	Exit Signs	2

**DIVISION 27 - COMMUNICATIONS**

27 05 14	Communication Cables Inside Buildings	5
27 51 16	Public Address and Mass Notification Systems	5

**DIVISION 28 - ELECTRONIC SAFETY AND SECURITY**

28 13 00	Access Control	1
28 23 00	Video Surveillance	4
28 31 03	Multiplex Fire Alarm System	8

**GEOTECHNICAL REPORT ATTACHED**

GEONORTH ENGINEERING 18 pages dated Sept 30 2016

**HAZMAT REPORT ATTACHED**

TOTAL SAFETY 49 pages dated Sept 23 2016



## BID SOLICITATION

Project:

### **SMITHERS REGIONAL AIRPORT – TERMINAL UPGRADE AND EXPANSION**

THE TOWN OF SMITHERS invites bidders to submit a tender for construction of the AIRTERMINAL UPGRADE AND EXPANSION, the tenders must comply with all the terms and conditions of these tender/contract documents.

## 00200 INSTRUCTIONS TO BIDDERS

- 1.1 The Owner of the Project is the TOWN OF SMITHERS.

Submit signed and sealed Tender on the attached tender forms, and returned in an envelope clearly marked:

### **SMITHERS REGIONAL AIRPORT – TERMINAL UPGRADE & EXPANSION**

Contract no 2017-11

addressed to:

### **TOWN OF SMITHERS**

**Rob Blackburn**

Project Coordinator  
Town of Smithers  
1027 Aldous Street  
P.O. Box 879 V0J2N0

Tenders will be received up to **14:00:00 hours** pacific local time, **MAY 24 2017. (Add 5)**

- 1.2 Tenders received after closing time will be returned unopened.
- 1.3 It is the Bidder's/Contractor's responsibility to allow sufficient time for their agent to deliver their Tender by the time and date specified above.
- 1.4 Facsimile or Electronic Tenders will **not** be accepted; however, bidders may issue a revision of their tender form by electronic means up until the tender closing time shown above. Electronic revisions shall be addressed to Rob Blackburn by email at [rblackburn@smithers.ca](mailto:rblackburn@smithers.ca)

- 1.5 Tenders received will be privately opened after the closing time.
- 1.6 Bidders/Contractors finding discrepancies or ambiguities in or omissions from the Tender documents, or in doubt as to their meaning, shall at once notify the contact person as noted in 1.8 below, this section, who will arrange for a ruling and issue an addenda. Such notification shall be made no later than THREE (3) working days prior to closing of the Tender.
- 1.7 All Tenders shall be signed by a duly authorized person having the authority to sign the Tender on behalf of the person, firm, or Corporation submitting the Tender. Tenders submitted by Corporations should bear the Corporate Seal of the Bidder/Contractor.
- 1.8 Inquiries regarding Tender documents may be telephone, email, letter or facsimile and addressed to:  

Moore Wilson Architects Inc.  
Attention: George Gogoulis  
Tel 250 384 2131 ggogoulis@moorewilson.ca

The deadline for submitting inquiries is **12:00 pm May 15 2017**
- 1.9 Any cost incurred by the Bidders/Contractors in the preparation of the Invitation for Tender documents will be borne solely by the Bidder/Contractor and the Invitation for Tender documents will become the property of the Town of Smithers.
- 1.10 In addition to the **original** copy of the Tender document ONE (1) copy is required.
- 2 Bid Depository
  - 2.1 BID\_DEPOSITORY is not applicable to this project
- 3 Acceptance of Bids
  - 3.1 Tenders shall be valid and remain open for acceptance for a period of SIXTY (60) calendar days after the closing date.
  - 3.2 The Bidder/Contractor may withdraw their Tender at any time prior to the time specified for the receipt of Tenders. No Tender may be withdrawn after the opening of Tenders.
  - 3.3 Tenders will not be accepted after the specified time, unless an extension of time has been authorized in writing.
  - 3.4 The Town of Smithers reserves the right to reject any or all Tenders. The lowest or any Tender will not necessarily be accepted.
- 4 Notice of Award
  - 4.1 The acceptance of Tender will be a written communication either a Purchase Order and/or a Letter of Intent from Town of Smithers.
  - 4.2 Formal execution of contract will occur on award of contract where the Town of Smithers will execute the standard CCDC 2-2008 Stipulated Price Contract.

5 Subcontractors

- 5.1 Nothing contained in the contract documents shall create a contractual relationship between a subcontractor and the Town of Smithers.

6 Substantial Performance

- 6.1 The Bidder/Contractor shall substantially complete the work described herein by August 31 2018.

**00250 Site-Visit**

Part 1 – General

- 1.1 Bidders may at their option visit the site to familiarize themselves with existing site conditions. There will be an optional site visit for all bidders on April 20 at 11:00 am at the front entry of the terminal building.
- 1.2 Claims for additional costs will not be considered with respect to existing conditions that could have been ascertained by an inspection of the existing site prior to bid closing day.

**00360 Permit Application**

Part 1 – General

- 1.1 Owner will obtain and pay for the required building permits and licenses only. All other permits, licenses, and fees are the responsibility of the contractor.

**BID FORM**

**SMITHERS REGIONAL AIRPORT – TERMINAL UPGRADE AND EXPANSION**

SMITHERS CONTRACT NO 2017-11

Name \_\_\_\_\_  
(hereinafter referred to as the "Bidder/Contractor")

Address \_\_\_\_\_

Telephone Number \_\_\_\_\_ Fax Number \_\_\_\_\_

WorkSafeBC Registration Number \_\_\_\_\_

**Discrepancy of Price**

In the event of a discrepancy between the written and numerical amounts of any price quoted, the written amount shall prevail.

**Offer**

Having carefully examined all the Tender documents including the CCDC 2–2008 Stipulated Price Contract, the plans, the site, and the conditions affecting the work as well as all the addenda, and having carefully read the specifications, we, the undersigned, offer to furnish all materials, labour, and equipment necessary to complete properly the entire work in all particulars, in accordance with these Contract Documents, the specifications, plans, and addendum instructions of the TOWN OF SMITHERS, for the sum of:

**The Contract Price**, excluding Value Added Taxes (e.g.: GST) is:

\_\_\_\_\_ Dollars

\$\_\_\_\_\_ includes all applicable taxes except for GST.

**Value Added Tax** of (\_\_\_\_ %) payable by the Owner to the Contractor is:

\_\_\_\_\_ Dollars

\$\_\_\_\_\_

**Total Amount of Tender** payable by the Owner to the Contractor for the Construction of the Work is:

\_\_\_\_\_ Dollars.

\$\_\_\_\_\_

[illegible]

### List of Subcontractors and Suppliers

The Contractor agrees to subcontract the following parts of the Work to the Subcontractor or Own Forces listed for each part. The Owner, in its sole discretion, may require the Contractor to demonstrate that the listed Subcontractors and Own Forces can perform the Work.

#### 1.1.2. Subcontractors

Part of the Work

Subcontractor's Legal Name

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

#### 1.1.3. Suppliers

Part of the Work

Subcontractor's Legal Name

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

### Security and Other Requirements

The Bidder/Contractor offers to:

- 1.1.4. provide the Performance Security as required and in accordance with the Contracting Requirements, Section 00610–Bonds and Certificates, Clauses 2–Performance Bonds and 3–Labour and Material Payment Bonds;
- 1.1.5. furnish the schedule of values (with initial breakdown) in accordance with Part 5 of the General Conditions – PAYMENT of the CCDC 2–2008 Stipulated Price Contract;
- 1.1.6. Provide Proof of Insurance in accordance with Section 00800–Supplementary Conditions.
- 1.1.7. Provide a detailed Construction Schedule in accordance with the General Conditions in CCDC 2–2008 Stipulated Price Contract.

This offer is irrevocable and shall remain open for acceptance by the Owner for a period of SIXTY (60) calendar days from the time and date specified for closing of Tenders.

### Cash Allowances

The following is a list of Cash Allowances to be included in the tender price on the tender form. These prices are net of GST. These items are subject to later detailed specification once requirements are more fully known.

1	AIR TERMINAL SIGNAGE, SCOPE AND SPEC TO BE DETERMINED	
	CASH ALLOWANCE \$	2,000
2		
	CASH ALLOWANCE \$	
3		
	CASH ALLOWANCE \$	
4		
	CASH ALLOWANCE \$	
5		
	CASH ALLOWANCE \$	

### Separate Prices

The following is a list of Separate Prices and forms a part of this Contract, upon the acceptance of any or all of the Separate Prices. The Separate Prices stated are a deduction from or addition to the Tender Price and do not include VAT. Do NOT state a revised Total Amount of Tender.

1	REPLACEMENT OF AHU NO 1 - (ref page 23 of this section)	
		Add \$
	SEPARATE PRICE No 2: ADDENDUM No. 1 - (ref page 23 of this section)	
2		
		Add \$
3		
	Deduct \$	Add \$
4		
	Deduct \$	Add \$
5		
	Deduct \$	Add \$

**Signature**

IN WITNESS WHEREOF the Bidder/Contractor has hereunto set his or her hand and seal and where a Bidder/Contractor is a corporate entity the corporate seal of the said company has been affixed in the presence of its duly authorised officers this

\_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_\_

SIGNED SEALED AND DELIVERED BY the Bidder in the presence of

(a)\_\_\_\_\_

(c)\_\_\_\_\_ (seal)

(b)\_\_\_\_\_

If the Bidder/Contractor is not incorporated, he or she shall sign on line (c) in the presence of a witness who shall sign on line (a). If incorporated, only the authorised signing officer(s) of the Bidder/Contractor shall sign on lines (a) and (b) and the corporate seal shall be impressed on line (c).



## **Bidding Addenda**

### **Part 1 – General**

- 1.1 Addenda to the Tender issued prior to closing of Tenders shall be incorporated into the Tender and shall become part of the contract documents.

## **CONTRACTING REQUIREMENTS**

### **AGREEMENT**

#### **Part 1 – General**

##### **1 Notice of Acceptance and Execution of the Contract**

- 1.1 The acceptance of Tender will be a written communication known as the Purchase Order, followed by a Letter of Intent from Town of Smithers.
- 1.2 Formal execution of contract will occur on award of contract where Town of Smithers will execute the standard CCDC 2–2008 Stipulated Price Contract.

##### **2 Contract Documents**

- 2.1 The Contract Documents listed in Article A-3 of the Agreement of the CCDC 2–2008 Stipulated Price Contract and this Invitation to Tender, in its entirety, shall form the contract.

## **00600 BONDS AND CERTIFICATES**

### **00610 Bonds**

#### **Part 1 – General**

##### **1 Bid Bond**

- 1.1 Each Tender Form received from a Bidder/Contractor must be accompanied by a Bid Bond in the amount equal to TEN PERCENT (10%) of the TOTAL AMOUNT OF TENDER. Certified cheques will be accepted.
- 1.2 Bid Bonds shall be issued on a form approved by the Insurance Bureau of Canada and issued by a Surety acceptable to the Owner.
- 1.3 If any Bidder/Contractor declines to enter a Contract within the period set out in the Tender Form, or a further agreed period of time, the principal and surety will be required to pay to the Owner, a sum equivalent to the difference between the principal's bid and the next qualified bid or TEN PERCENT (10%) of the principal's bid, whichever is the lesser.

##### **2 Performance Bond**

- 2.1 The successful Bidder/Contractor shall supply, within TEN (10) calendar days from the date of acceptance, a Performance Bond in the amount of FIFTY PERCENT (50%) of the

total contract price. Such bond must be issued by a surety company licensed to transact business in the Province of British Columbia and must be in a form and contain terms satisfactory to the Town of Smithers.

2.2 The cost of such bond shall be borne by the successful Bidder/Contractor.

### 3 Labour And Material Payment Bond

3.1 The successful Bidder/Contractor shall supply, within TEN (10) calendar days from the date of acceptance, a Labour and Material Payment Bond in the amount of FIFTY PERCENT (50%) of the total contract price. Such bond must be issued by a surety company licensed to transact business in the Province of British Columbia and must be in a form and contain terms satisfactory to the Town of Smithers.

## **00640 Release of Liens**

### Part 1 – General

1.1 Please use CCDC 9A–82 Statutory Declaration–Holdback Release with final payment (Contractor to supply form).

## **00650 Statutory Declaration Forms**

### Part 1 – General

1.1 Please use CCDC 9B–82 Statutory Declaration–Progress Claims with final payment (Contractor to supply form).

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## 00800 SUPPLEMENTARY CONDITIONS

1. The Standard Construction Document, CCDC 2–2008 Stipulated Price Contract, in its entirety, shall apply to this Contract, except as noted below.
  - 1.1. SUPERVISOR, the following shall be added:
    - 1.1.1. "It shall be the responsibility of the Contractor to co-ordinate his work and the work of all Subcontractors, to provide a mutually agreeable schedule. The responsibility as to which Subcontractors provides required articles or materials to be built or provided rest solely with the Contractor. Extras will not be considered based on grounds of difference in interpretation of specifications as to which trade involved shall provide certain specialities or materials."
  - 1.2. APPLICATIONS FOR PROGRESS PAYMENT, revise Article 5.2.5 to read as follows:
    - 1.2.1. "The Contractor shall include a statement based on the schedule of values with each application for payment. The Contractor shall also submit a completed Statutory Declaration (CCDC 9B–82 Statutory Declaration–Progress Claims) and Worksafe BC, letter of coverage showing account in good standing with each application for payment after the first."
  - 1.3. CHANGE ORDER, the following shall be added:
    - 1.3.1. The Contractor and the Subtrade are entitled to the net cost of Labour and materials plus all compulsory government charges and insurance plus TEN PERCENT (10%) overhead and then FIVE PERCENT (5%) profit.
    - 1.3.2. Where a change entails materials and Labour supplied and performed by both the Contractor and the Subtrade, then each shall include overhead and profit as per 6.2.3 above, but only on their respective parts of the work. The Contractor in addition is entitled to FIVE PERCENT (5%) overhead/profit on the Subtrade portion of the work.
    - 1.3.3. Where a change involves a Subtrade only a contractor is entitled to FIVE PERCENT (5%) overhead/profit on the total of the Subtrade work.
    - 1.3.4. When a change involves substituting one item for another already included in the Contract, the value of the change, and applicable mark-ups, shall be applied to the difference in net value of the item only.
    - 1.3.5. When a change involves a net credit to the Contract the value of the change will be the net value without mark-ups.
  - 1.4. CHANGE DIRECTIVE, revise GC 6.3.2 and add the following:
    - 1.4.1. "The Contractor will receive TEN PERCENT (10%) overhead and TEN PERCENT (10%) profit for work performed by his own forces, and FIVE PERCENT (5%) overhead and FIVE PERCENT (5%) profit for work performed by Subcontractors for the Contractor. If the

Subcontractor supplies only an item to the Contractor he shall charge his net cost plus TEN PERCENT (10%)."

#### 1.5. OCCUPATIONAL HEALTH AND SAFETY

- 1.5.1. It is the contractor's responsibility to perform all work in full compliance with Airport and Worksafe BC safety standards. In order to ensure the safe operation of the contracted work, the Contractor shall provide to the Town of Smithers upon request:
- 1.5.2. Proof the employees are covered by Worksafe BC and evidence in writing of account in good standing.
- 1.5.3. Information concerning the contractor's own health, safety programs in compliance with Worksafe BC and WHMIS in the copy of the Firm's Safety Manual, including personal protective equipment used, emergency procedures, standard work procedures and education and training of employees.
- 1.5.4. The Contractor is responsible for ensuring that every employee and worker at the place of employment, for which they are primarily responsible, complies with all WCB regulations.
- 1.5.5. The Contractor shall be deemed the "Prime Contractor" for the purposes of Worksafe B.C.

#### 1.6. HUMAN RIGHTS

- 1.6.1. All Contractors and Sub-Contractors performing work on this project are responsible for ensuring that every employee and worker at the place of employment for which they are primarily responsible, complies with current BC Human Rights Legislation.

#### 1.7. LOCAL LABOUR AND EQUIPMENT

- 1.7.1. The Contractor is requested to employ local personnel and equipment whenever possible.

#### 1.8. ENVIRONMENTAL REQUIREMENTS

- 1.8.1. The Contractor and its sub-contractors shall, during the performance of the Work, comply with all current federal, provincial and local regulations and policies concerned with the protection of the environment. All products and materials incorporated in the work shall, to the furthest extent possible, be of environmentally-friendly composition and manufactured by firms that have processes and technology that utilizes environmentally-friendly manufacturing methods.

#### 1.9.

1.10. INSURANCE CONDITIONS

1.11. *The Town will provide Wrapup Liability insurance with a limit of \$10,000,000 which includes the Owner, contractor, subcontractors, project and construction managers, architects, engineers and consultants whilst engaged in operations related to the project. (PTA-1)*

1.11.1. The Contractor shall provide and maintain property insurance, insuring the full value of the Work in the amount of the Contract Price, plus the value of Owner-supplied materials and equipment, if any, and the insurance shall:

- 1.11.1.1. be in the joint names of the Town of Smithers and the Contractor, and shall include the interest of the Town, the Contractor, Subcontractors and all others having an insurable interest in the Work;
- 1.11.1.2. include all Subcontractors as unnamed insureds or, if they specifically request, as named insureds;
- 1.11.1.3. preclude subrogation claims by the insurer against anyone insured thereunder;
- 1.11.1.4. be provided for by either a builders' risk policy, or an installation floater and insure against all risks of direct loss or damage, including flood and earthquake, subject to any exclusion expressly specified in the Contract and shall apply to all material, equipment, machinery, labour and supplies of any nature whatsoever, the property of the insureds or others for which the insureds may have assumed responsibility, to be used in or pertaining to the site preparation, demolition of existing structures, erection, fabrication, reconstruction, or repair of the Work, or the Site and in transit, subject to the exclusions of the policy specified;
- 1.11.1.5. provide coverage for damage to the Work as a result of an accident to any pressure vessel or vessel under vacuum during the period of such policies up to certification or being placed in operation; and apply to both the installation and testing phases;

1.11.2. The Contractor shall provide and maintain all-risks contractors' equipment insurance protecting all machinery and equipment used by the Contractor in the performance of the Work for the value of any such machinery and equipment; and All property insurance shall be maintained continuously until 10 Days after the date of the Contractor's final application for payment to the Town of Smithers.

1.11.3. All insurance policies shall provide that in the event of a loss, payment for damages to the Work shall be made to the Town of Smithers and the Contractor as their respective interests may appear. The Contractor shall act on behalf of the Town of Smithers and itself for the purpose of adjusting the amount of such loss with the insurers. On the determination of the extent of the loss, the Contractor shall immediately proceed to restore the Work and shall be entitled to receive from the Town of Smithers (in addition to any sum due under the Contract) the amount at which the Town of Smithers' interest in the restoration work has been appraised, to be paid as the work of the restoration proceeds and in accordance with the Contractor's application for payment, but only to the extent that the Town of Smithers actually receives payment from the insurer or insurers in respect of that loss, and the Town of Smithers is not liable to pay the Contractor anything in any other case.

1.11.4. The Contractor shall, from time to time at the request of the Town of Smithers, provide to the Town certificates of insurance satisfactory to the Town, acting reasonably, that all policies of insurance required by these Insurance Conditions are in force, un-amended and not cancelled, and that any premiums due therefore have been paid in full.

1.11.5. All insurance policies under these Insurance Conditions shall contain an endorsement to provide all named insureds with prior notice of changes and cancellations, and such endorsement shall be in the following form:

1.11.5.1. "It is agreed that the coverage provided by this insurance shall not be changed or amended in any way nor cancelled until 30 days after notice of such change or cancellation has been given to all named insureds."

1.11.6. If the Contractor fails to comply with these Insurance Conditions in any respect, the Town may, in its sole discretion, perform the Contractor's obligations under these Insurance Conditions, at the expense of the Contractor, which expense may be withheld by the Town of Smithers in accordance with the General Conditions. Nothing in this section places any obligation on the Town to act under this section or relieves the Contractor from its obligations under these Insurance Conditions.

1.11.7. The Contractor shall require all its Subcontractors, of every description, to provide and maintain insurance as required by the appropriate sections in these Insurance Conditions and those sections shall, with respect to any such Subcontractors, be read as if those sections referred to them.

1.11.8. The Contractor shall be responsible for any and all deductibles payable in any of the foregoing policies.

#### 1.12. MUNICIPAL BYLAWS

1.12.1. The Contractor and its sub-contractors shall strictly comply with the Town of Smithers Bylaws.

#### 1.13. JOINT & SEVERAL LIABILITY

1.13.1. Where the Tender and Contract are executed by more than one person, firm or corporation the Contractor and all persons, firms and corporations so executing the Contract shall be jointly and severally liable and bound by the Contract.

#### 1.14. MISCELLANEOUS

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1.14.1. Time is of the essence.

**00900 ADDENDA AND MODIFICATIONS**

Part 1 – General

**00910 Addenda**

Part 1 – General

- 1.1 Addenda to the Tender issued prior to closing of Tenders shall be incorporated into the Tender and shall become part of the contract documents.

END SUB-SECTION 0091



## SEPARATE PRICES

The following is a list of separate prices to be entered into the appropriate filed of the tender form as an "add" to the base bid price entered on the tender form:

### SEPARATE PRICE NO 1: REPLACEMENT OF AHU NO 1

- 1) Demolition of existing AHU-1 as shown on drawing M241. Demolition is to include all items required for the removal of existing AHU-1. This will include but not be limited to the following items associated with the demolition of AHU-1: Electrical power connection (as indicated on electrical IFT drawings), existing control systems (wiring, tubes, panel and all control devices), ductwork at connection points of unit, heating water branch piping connected to AHU-1. This demolition is also to include all other hangars, support and accessories associated with the demolition of existing AHU-1.
- 2) Provision, warranty and install of new AHU-1 as shown on drawing M241 and scheduled on drawing M400
- 3) Power connection of new AHU-1 and associated components as indicated on electrical IFT drawings
- 4) New DDC controls for AHU-1 as indicated in IFT specifications. Including but not limited to: wiring, programming, graphics, new AHU building controller and points as scheduled in specification sections 25 05 01, 25 90 01 & 25 90 02)
- 5) Connection of ductwork between new AHU and existing ductwork as shown on drawing M241
- 6) New heating water branch piping from existing heating water mains to new AHU-1 shown on drawing M241. Branch piping to include new control valve, shut-off valves, insulation and other accessories
- 7) All crawlspace level chilled water branch piping north of gridline 9 to location of new AHU-1 shown on drawings M201 and M241. This is to include chilled water piping through existing crawlspace, basement and mechanical room. Branch piping to include new control valve, shut-off valves, insulation and other accessories

### SEPARATE PRICE No 2: ADDENDUM No. 1 - EXPANDED TERMINAL UPGRADES (ADD 1)

- 1) The general scope is to upgrade the thermal performance of the remaining Airport exterior walls and windows, provide a new Arrivals Vestibule, and update the interiors of the Administration/Offices wing as outlined in Addendum No. 1.
- 2) Refer to Architectural Addendum No. 1, Structural Addendum No. 1, Mechanical Addendum No. 1, and Electrical Addendum No. 1 for a complete description of the works.

## Unit Rates Cost Quotation for Environmental Issues

Work in addition to the Scope of Work described in the Smithers Regional Airport Terminal Upgrade and Expansion, Contract #2017-11, may be requested / authorized to remove contamination present below the proposed expansion area.

Shell Oil Ltd. is prepared to, under a separate contract, take responsibility for the costs associated with the Shell-caused environmental issues in the Target Areas (indicated in the attached sketch). For clarity, the Costs will be those costs which are in excess of the costs that would have been incurred if the Target Areas were not contaminated. Examples of such Costs include, but are not limited to, the costs, associated with tipping contaminated soils, over-excavating the Target Areas due to contamination, backfilling and compacting the over-excavated Target Areas, etc.

This work would be undertaken in a separate contract with Shell and be billed at time and materials basis. These rates would not apply for work that would otherwise be required for Contract #2017-11.

Proponent bidders are to provide pricing per Table A-1 for the additional work which will form the cost basis of the separate contract.

For general information, it is anticipated that;

All charges will need to be identified to a SNC-Lavalin Project Manager immediately, in writing on a daily basis, and approved by the SNC-Lavalin Project Manager prior to billing. For clarity, time and materials rates would apply in the following likely examples:

- Over excavation –for the sole purpose of expanding the ‘baseline’ excavation to remove additional Shell-caused contaminated soil, beyond those areas as necessary/specified for the airport expansion project.
- Move/relocate/support/replace underground utilities – for utilities that need to be moved/relocated/supported or replaced solely because of environmental.
- Stock pile –for the purpose of temporarily managing excavated soils containing Shell-caused contamination in excess of the applicable standards, prior to offsite disposal.
- Load –for any soils associated with over-excavation and removing stockpiles of contaminated soils.
- Engineered fill - for replacement of excess soils removed in areas specifically requiring engineered fill, beyond what soils would need to be removed for the expansion project, and would be associated with over-excavation
- Haul - for Shell-caused contaminated soil only.
- Supply/Haul clean fill - for replacement of excess soils removed, beyond what soils would need to be removed for the expansion project, and would be associated with over-excavation
- Place/compact clean fill - for replacement of excess soils removed, beyond what soils would need to be removed for the expansion project, and would be associated with over-excavation

If other examples arise during the work that is associated with excavation of Shell-caused contamination, those would need to be discussed with the SNC-Lavalin Project Manager for agreement that scope and costs would be “Incremental Costs” and billable to Shell.

Refer also to the attached diagram of the Target Areas identified in orange as ‘Excavation 1’ and ‘Excavation 2’

Bidders are required to complete the following unit prices sheet.

## Unit Prices

Bidders are required to complete the following unit prices sheet.

**TABLE A-1: Hourly/Daily Rates**

Personnel/Equipment and Related Expenses	Unit Rate (\$)	Contractor Quote	Equipment Model
Project Manager	/Hour		
Project Superintendent	/Hour		
Equipment Operator	/Hour		
Labourer	/Hour		
Living Out Allowance	/Day		
Excavator (including Operator)	/Hour		
Loader (including Operator)	/Hour		
Bobcat (including Operator)	/Hour		
Breaker/Hoeram (including Operator)	/Hour		
Roller/Compactor (including Operator)	/Hour		
Generator and Fuel	/Day		
Crew Truck	/Day		
Trash Pump and Flexible Hosing	/Day		
Aboveground Storage Tank	/Day		
Backfill	/Metric Tonne		
Truck (for soil hauling)* * specify rates for truck, truck & pony, truck & quad trailer (as proposed for utilization)	/Hr		
Other Daily or Hourly Charges (incl. any and all hand tools) – List and specify below or on separate sheet	/Day or /Hour	Attach separate sheet if required	
Mark-up on 3 <sup>rd</sup> party services and materials*	Cost plus ____%		
Daily or Hourly Delay to Contract 2017-11 due to Environmental Issues work	/Day or /Hour		

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 GENERAL DESCRIPTION**

- .1 The work of this Contract consists primarily of renovation and expansion to the existing Smithers Air Terminal Building, located at Smithers BC.
- .2 Refer to Section 01110 - Summary of Work.

**1.3 CONTRACT DOCUMENTS**

- .1 The wording "inspection" in the Contract Documents shall be read as "review", when carried out by the Consultant.
- .2 The Consultant will not be responsible for and will not have control, charge, or supervision of construction means, methods, techniques, sequence, or procedures, or for safety precautions and programs required in connection with the Work in accordance with the applicable construction safety legislation, other regulations, or general construction practice. The Consultant will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Consultant will not have control over, charge of, or be responsible for the acts or omissions of the Contractor, Subcontractors, Suppliers, or their agents, employees, or any other persons performing portions of the Work.

**1.4 SPECIFICATIONS**

- .1 Division 1 of the Specifications generally specifies Work and coordination of Work that is the direct responsibility of the Contractor but shall not be interpreted to define the limits of responsibility that must be established between the Contractor and its Subcontractors by their separate agreements.
- .2 Ensure that Subcontractors, Assigned Contractors and Suppliers understand that the Special Conditions, General Conditions of Contract and Division 1 apply to sections of the Specification governing their Work.
- .3 Ensure that the Work includes all labour, supervision, equipment and Materials required, necessary or normally recognized as necessary for the proper and complete execution of the Work.
- .4 Wherever in the Contract Documents the words "approval", "approved", "direction", "directed", "selection", "selected", "request", "requested", "report", "reviewed" and similar words are used, such approvals, directions, selections, requests and reports shall be given by the Consultant unless specifically stated otherwise.
- .5 Wherever in the Contract Documents the word "provide" is used in any form, it shall mean that the Work concerned shall include both supply and installation of the Materials required for the completion of that part of the Work.
- .6 Wherever in the Contract Documents the word "supply" is used in any form, it shall mean that the Work specified to be supplied includes delivery to Site and unloading, handling and hoisting at location directed.
- .7 Wherever in the Contract Documents the word "installed" is used in any form, it shall mean Work specified for installation includes off-loading, uncrating, unpacking, inspection

and storage; moving from stored location to place of installation; and installing to meet specified requirements.

- .8 Wherever in the Contract Documents it is specified that Work is to proceed or to meet approval, direction, selection or request of jurisdictional authorities or others, such approval, direction, selection or request shall be in writing.
- .9 Wherever in the Contract Documents or as directed by the Consultant it is specified that Work shall be repaired, made good or replaced, it shall be performed without any additional cost to the Town of Smithers.
- .10 Wherever in the Contract Documents the term "and/or" is used, the Consultant shall decide which of the possible meanings applies to the sentence where this term occurs.
- .11 Wherever in the Specifications the term "Related Sections" is used, it shall be taken to mean Work that is directly related to the section but not specified therein. The purpose of this clause is to redirect the reader to other sections of the Specifications for Work related to this section. This clause shall not be construed as a definition of trade responsibility, nor is it exhaustive in its description of related Sections and is included for convenience only.

## **1.5 DRAWINGS**

- .1 The Contractor is responsible for the coordination of metric and imperial dimensions as shown on the Drawings and as specified.
- .2 References to standards, unless otherwise specified, shall be taken to mean the most recent edition in effect at the date of receipt of bids. Where a standard is revised, supplemented or amended after award of the Contract, carry out the Work in accordance with most recent edition of such standards. If the revision to the standard is such that a revision to the Contract Price is necessary, submit claims to the Consultant in accordance with GC 44 Changes in the Work.
- .3 Drawings are in part diagrammatic and are intended to convey specific content of Work required and, as such, indicate general and approximate location, arrangement and sizes of Materials, elements, fixtures, equipment and outlets. Obtain more accurate information about locations, arrangement and sizes by studying, familiarizing with and correlating the Contract Documents and Drawings, including coordination with the shop drawings, and becoming totally familiar with conditions and spaces affecting these matters before proceeding with the Work. Report any differences between the Drawings and these conditions, in writing, to the Consultant immediately. Where job conditions require reasonable adjustments in the indicated locations and arrangements, make the necessary modifications at no additional cost to the Town of Smithers. Similarly, where existing conditions interfere with new installation and required location, include such relocation in the Work of this Contract. Install and arrange fixtures and equipment in such a way as to conserve as much headroom clearance and space as possible.

## **1.6 CODES**

- .1 Comply with the most recent edition of the British Columbia Building Code except as specifically noted.
- .2 Perform work in accordance with codes of federal, provincial or municipal authorities having jurisdiction provided that in any case of conflict or discrepancy, the more stringent requirement will apply.
- .3 Meet requirements of:

- .1 Contract Documents.
- .2 Specified standards, codes and referenced documents.

#### **1.7 SAFETY**

- .1 Observe and enforce construction safety measures required by the most recent edition of the British Columbia Building Code, Provincial Government of British Columbia, WorkSafe BC and all applicable municipal statutes and authorities having jurisdiction.
- .2 Comply with GC 9 Safety and Security
- .3 Ensure that no part of the Work or any existing facility is subjected to a load which will endanger its safety or will cause permanent deformation.
- .4 Ensure that electrical workers carrying out the Work are completely familiar with electrical circuits and equipment and their operation. Before undertaking any Work, coordinate required energizing and de-energizing of circuits with the Town of Smithers. At all times, observe electrical safety procedures and take necessary precautions to ensure safety to personnel at the Site, as well as safety to the public.

#### **1.8 ENVIRONMENTAL REQUIREMENTS**

- .1 Comply with GC 10 Environmental and Archaeological Protection
- .2 Work is to be accordance with the environmental protection rules, regulations and practices required by applicable legislation or general construction practice.

#### **1.9 ARCHIVE INFORMATION**

- .1 Archive drawings of the Airport's as-built condition are available from Town of Smithers Engineering Services. The list of as-built reference drawings is available upon request, from the Town of Smithers.
- .2 The Contractor shall obtain all relevant archive drawings and investigate the existing conditions of the area of Work. Where existing floor slabs are to be cut, locate any cast in place service lines in order to anticipate and provided for the services.

#### **1.10 DOCUMENTS ON SITE**

- .1 In accordance with GC 2 Documents, maintain at the Site one (1) copy of each of the following for use by the Consultant and the Town of Smithers, where applicable:
  - .1 Contract Drawings, Specifications, Addenda.
  - .2 Reviewed shop drawings, product data and samples.
  - .3 Site Instructions, Contemplated Change Orders, Change Orders and Field Work Orders.
  - .4 Inspection and test reports.
  - .5 Copy of all permits from authorities having jurisdiction.
  - .6 Updated Construction Schedule.
  - .7 A signed copy of the Contract, complete with the General Conditions of Contract, and the Supplementary Conditions.
  - .8 Town of Smithers's Construction Safety/Security Manual.

- .9 Approved methodology statements for each scope of work.

**1.11 MEASUREMENTS**

- .1 Perform Work using metric units of measurement, except where specifically noted otherwise.

**1.12 ADDITIONAL DRAWINGS**

- .1 Consultant may furnish additional drawings for clarification as required. These additional drawings will be issued under a field memo, field work order or change order and will have the same meaning and intent as if they were included with Drawings referred to in the Contract Documents.

**1.13 ITEMS SUPPLIED BY TOWN OF SMITHERS**

- .1 The Contractor is responsible for the offloading, storage, receiving reports, confirmation of inventory and transportation of remaining owner supplied materials to the Town of Smithers designated area at the end of the project.
- .2 The Contractor is responsible to support the repair of any owner supplied materials during the Warranty period, including, but not limited to, disconnect, install, reconnect and re-commissioning of any owner supplied materials replaced under warranty.

**1.14 WORK SCHEDULE**

- .1 Interim reviews of work progress based on work schedule will be conducted as determined from time to time by Town of Smithers and schedule updated by Contractor in conjunction with and to approval of Town of Smithers.
- .2 In order to meet the Project schedule, the Contractor may be required to work double shifts and seven days per week.
- .3 In order to meet the Project schedule, some Materials may have to be air-shipped at the Contractor's expense.

**1.15 AIRPORTS IN USE**

- .1 Portions of the Work will be conducted in the restricted area (Airside), necessitating the requirement for security procedures and supervision. Qualified permanent Restricted Area Identification Card (RAIC) holders are required to provide security escort services. Refer to Section 01565 - Security.
- .2 For portions of the Work to be conducted Airside, the Contractor's hours of work may be restricted or limited to minimize conflicts with Airport operations. Refer to Section 01140 - Work Restrictions Terminal and Section 01141 - Work Restrictions Airside.

**1.16 TOWN OF SMITHERS OCCUPANCY**

- .1 The Town of Smithers, its clients, its tenants will occupy existing premises within the Work site during entire construction period to conduct normal operations. Allow the Town of Smithers, its clients, its tenants and their customers full access and use of existing premises.
- .2 Construct Work in stages to accommodate the Town of Smithers's use of premises during construction. Cooperate with the Town of Smithers in scheduling construction operations to minimize conflict and to facilitate Town of Smithers usage.
- .3 Construct Work in stages to provide for continuous public use. Do not close off

emergency fire exits, public access and usage of facilities until use of one stage of Work will provide acceptable alternate exits, access and use. Provide necessary temporary wayfinding and exiting signage for the public and/or tenants.

- .4 When disruption of an existing access is necessitated by the Work, provide alternate protected routes approved by the Town of Smithers. The routes shall be maintained and kept clean by the Contractor.
- .5 The Contractor's access and use of the existing building and use of the existing facilities shall be in agreement with the Town of Smithers. All areas of travel, public use and Work in the existing building shall be kept clean at all times by the Contractor, to the satisfaction of the Town of Smithers.
- .6 The Contractor shall confine apparatus, the storage of Materials and the operation of workers to Work limits indicated on the Drawings and as required by laws, ordinances, permits or by direction of the Town of Smithers, and shall not unreasonably encumber the existing premises. Deliver Materials and equipment to the site on a just-in-time basis.
- .7 If the Contractor is required to carry out Work outside the limits of the agreed Work area, the Contractor shall contact the Town of Smithers immediately and shall not disturb additional areas without authorization by the Town of Smithers.
- .8 Airport operations will take precedence over all construction activity.

#### **1.17 PARTIAL PROJECT OCCUPANCY**

- .1 Pursuant to GC 38 Placing in Service and other clauses, the Town of Smithers reserves the right to take possession of and use some specific areas of any completed or partially completed portion of the Work, regardless of the timing of the completion of the entire Work. Such taking possession or use of the Work, or part thereof, shall not be construed as completion, Substantial Performance of the Work, Total Performance of Work or acknowledgement of fulfillment of the Contract.
- .2 Acceptance for occupancy or occupancy by the Town of Smithers of part or all of the Work shall be by mutual agreement between the Contractor, Consultant and the Town of Smithers and shall not relieve any party of their responsibilities under the Contract.
- .3 Guarantees and warranties for specific items within the occupied space shall become effective on the date of Total Performance of the Work except as otherwise agreed in writing by the Town of Smithers.
- .4 Partial occupancy is subject to the conditions of authorities having jurisdiction.

#### **2.0 PRODUCTS**

Not applicable.

#### **3.0 EXECUTION**

Not applicable.

END OF SECTION 01005



**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 GENERAL SCOPE OF WORK COVERED BY THIS CONTRACT**

- .1 The work of this Contract consists primarily of demolition, new construction, renovations and related work required to renovate and expand the existing air terminal building at the Smithers Airport B.C.
- .2 Refer to Section 00850 - Drawing List.
- .3 The Scope of Work of this Contract as shown on the Drawings and called for in the Specifications generally includes the following components:
  - .1 Demolitions of specified interior and exterior parts of the existing air terminal.
  - .2 Construction of various building extensions.
  - .3 Refurbishment of interior and exterior finishes to the existing building.
  - .4 Various site servicing and exterior civil engineering road and parking modifications.
  - .5 All related electrical, mechanical and fire protection work.
  - .6 Geothermal field and related installations.

**1.3 CONTRACTOR RESPONSIBILITIES**

- .1 The area of Work is an operational area and as such construction activities must be limited to the immediate work area and within the approved construction zone.
- .2 Maintain full operation and maintenance access to all adjacent aircraft gates. All gates shall remain fully functional and in use during the construction.
- .3 Pursuant to GC 21 Materials, assist with expediting and incorporating delivery date for each product into the Construction Schedule.
- .4 Incorporate delivery times for shop drawings, product data, samples and other submittals into the Construction Schedule.
- .5 Install, relocate and maintain temporary enclosures, hoardings and protection as required to carry out the Work.
- .6 Install, relocate, maintain and provide storage of barricades of Airside Work. Replace all Airport Authority supplied equipment that is damaged or destroyed during construction.
- .7 Receive, unload, handle and store products at site. Remove and dispose of crates and packing materials off-site.
- .8 Submit claims to the shipper for transportation damage and shortages.
- .9 Arrange for replacement of damaged, defective or missing items, or return of over-supplied items.
- .10 Handle products and spare parts at site including uncrating, handling, hoisting, storage

and protection.

- .11 Assemble, install, connect, commission, perform start-up test, adjust and finish products.
- .12 Request authorities to inspect installation as required by codes.
- .13 Coordinate requirements for start-up, commissioning personnel where applicable.
- .14 Provide security for the products and ensure that the products are not damaged or stolen.
- .15 Provide a full-time superintendent for the duration of the Work. The superintendent will not be changed without prior written consent from the Town of Smithers and the Consultant.
- .16 Repair or replace items damaged or stolen during the Work. Replace spare parts used in the Work.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01110

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 REQUIREMENTS**

- .1 Contractor shall undertake all means necessary to maintain the Contract schedule.
- .2 The phasing identified in the Contract Documents is to be maintained and adopted by the Contractor.
- .3 Replacement or backup equipment must be readily available in the event of equipment breakdown or alternate resources must be at the Contractor's immediate disposal to ensure Work is not compromised or delayed.
- .4 The construction schedule should be developed using the above dates as a basis, although some flexibility may be permitted provided that major milestones and operational constraints are adhered to in achieving Total Performance of the Work. All deviations from the construction schedule will require approval of the Airport Authority.

**1.3 PROJECT SCHEDULE MILESTONES**

- .1 Schedule the Work in accordance with the following project milestone dates:
- |    |                        |             |
|----|------------------------|-------------|
| .1 | Substantial Completion | AUG 31 2018 |
| .2 | Total Completion       | SEP 30 2018 |

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01115

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 GENERAL REQUIREMENTS**

- .1 Comply with GC 9 Safety and Security, GC 11 Use of Premises, GC 15 Overtime, Hours of Work, GC 17.
- .2 The Town of Smithers has complete jurisdiction over access of the Contractor's staff and workers into the existing buildings and control of construction vehicle routes, parking, loading/unloading zones, etc. as outlined in these Specifications.
- .3 Do not disrupt Airport business except as permitted by the Town of Smithers.
- .4 Airport operations take priority at all times over Contractor's operations and the Work.
- .5 Immediately halt the Work if instructed to do so by Town of Smithers or security escort to permit Airport operations to continue.
- .6 Except as outlined in GC 34 Delays, include costs for possible delay, inconvenience and coordination in Contract price.

**1.3 HOURS OF WORK**

- .1 The work may be performed 24 hours a day, 7 days a week, except as noted below. Regular working hours are from 06:30 hours and 17:00 hours.
- .2 Conduct noisy, interruptive or odorous work at night only between 23:00 and 05:00 hours local time. (Noisy work includes concrete cutting, coring, jack hammering, pile driving and the like.)
- .3 Removal of all demolished material from the construction areas must occur at night only between 23:00 and 05:00 hours, unless removed from a hoarded area direct to the exterior via an agreed access route.
- .4 Erection of new hoarding and platform scaffolding must be performed only at night between 23:00 and 05:00 hours.
- .5 Any work outside of a hoarded area must be conducted between 23:00 and 05:00 hours.
- .6 Any shutdown of existing systems must be conducted between 23:00 and 05:00 hours, with approval of the Town of Smithers and in accordance with specified lockout procedures.
- .7 Work may be subject to change or delays due to Airport operations, late flight arrivals etc.
- .8 The Town of Smithers may, at their discretion, restrict Work in certain areas of the Airport during peak operational hours or days.
- .9 Modify the work schedule when required by the Town of Smithers to accommodate on-going Airport operations.

**1.4 WORK IN AIR TERMINAL BUILDING AND ON SITE**

- .1 The Airport will remain fully operational throughout construction. Perform the Work with

minimum disruption to public and Airport operations during construction.

- .2 Maintain building mechanical, electrical, communications and security systems for operational areas of the building at all times. Maintain access to any maintenance or support rooms located inside the Site.
- .3 Perform Work in the restricted area (Airside) in accordance with the rules and regulations of the authorities having jurisdiction. Refer to Section 01565 - Security.
- .4 Provide hoarding, dust barriers or platform scaffolding and barriers where necessary to contain the Work and protect the public. Refer to Section 01560 - Temporary Barriers and Enclosures.
- .5 Clean up Work daily, to degree directed and acceptable to Airport Authority. Refer to Section 01740 - Cleaning.
- .6 Locate refuse bins subject to approval of Airport Authority.
- .7 Do not restrict or limit existing emergency exits. If emergency exits discharge into the Site, provide a protected route through the Site not less than 1100 mm wide.
- .8 Open trenches and/or excavation areas will not be permitted within public areas of the terminal without written approval from the Town of Smithers. Provide road plates over open trenches and/or excavation on roadways to allow movement of vehicles and equipment.
- .9 Access the Site only via route(s) pre-approved by the Town of Smithers. Refer to Section 01550 - Vehicular Access and Parking.

#### **1.5 PUBLIC ACCESS**

- .1 Free access by the public to designated public access areas not under construction shall be maintained at all times.
- .2 Maintain existing entrances and fire exits free from obstruction throughout alteration Work. Provide alternative and additional exits where required by authorities having jurisdiction.
- .3 The Contractor shall conduct all activities in a manner that respects the continuing operation activities of the Airport and presence of the public during the Work.
- .4 Provide the public and/or tenants a dust free area by providing air tight barriers.

#### **1.6 NOISE**

- .1 Unless otherwise approved by the Town of Smithers, all Work involving excessive noise, vibration including, but not necessarily limited to, jack hammers, concrete saws, concrete drills, steel saws, explosive-activated tools or activities disruptive to the normal operation of the Airport or dangerous to the occupants shall be carried out during time periods approved by the Airport Authority.
- .2 The Contractor shall comply with the requirements of the Town of Smithers regarding noise abatement and shall take all necessary steps to ensure that the generation and transmission of noise and vibration due to this Work is kept to minimum.
- .3 Construction methods shall be maintained to ensure a low level of construction noise. Sound enclosures, sound baffles, muffler-equipped equipment and vibration platforms shall be employed to keep all equipment as quiet as practicable and the noise emission

as low as possible.

**1.7 PERMITS AND LOCKOUT POLICY**

- .1 The Contractor will require Town of Smithers approval prior to proceeding with select construction activities including but not limited to lockout of existing building systems, coring and saw-cutting, excavation and trenching, hot work and crane/hiab operation.

**1.8 LOW VISIBILITY OPERATIONS**

- .1 To safely allow aircraft operations to continue when fog is present, the Town of Smithers will implement its Low Visibility Plan. Low Visibility conditions are most common during the autumn and spring months in morning hours due to "condensation fog".
- .2 When visibility conditions at the Airport is reduced below 2600 feet Runway Visual Range (RVR horizontal) and 500 feet ceiling, the Town of Smithers begins to prepare for operating in low visibility conditions (visibility below RVR1200). During this preparatory phase, the Contractor must be prepared to vacate the airfield within five (5) minutes notice or suspend their activities if the conditions deteriorate to RVR1200 or below.
- .3 When Low Visibility conditions are declared, complete cessation of all Work in the airfield can be expected; limited movement of vehicles around the terminal may also be required. The intent is to reduce aircraft-vehicle interactions and the limitations implemented will be dependent on a number of factors including, but not limited to, location, work activity, time of day and operational requirements.
- .4 The Contractor is to provide for Low Visibility events in their Contract price. No compensation will be made for suspension of Work periods or for periods of standby time during low visibility conditions.

**1.9 MOVEMENT OF EQUIPMENT AND PERSONNEL**

- .1 Refer to Section 01550 - Vehicular Access and Parking.
- .2 Prior to construction, provide for review, plan drawing detailing location of all proposed haul roads, ramps, access points, with associated timing requirements. Plan drawing requires approval of Town of Smithers prior to construction.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 0114

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 GENERAL REQUIREMENTS**

- .1 Comply with GC 9 Safety and Security, GC 11 Use of Premises, GC 15 Overtime, Hours of Work, GC 17 Compliance to the Town of Smithers's Rules and Regulations and the Construction Safety/Security Manual.
- .2 The Town of Smithers has complete jurisdiction over access of the Contractor's staff and workers into the existing buildings and control of construction vehicle routes, parking, loading/unloading zones, etc. as outlined in these Specifications.
- .3 Do not disrupt Airport business except as permitted by the Town of Smithers.
- .4 Airport operations take priority at all times over Contractor's operations and the Work.
- .5 Immediately halt the Work if instructed to do so by the Town of Smithers to permit Airport operations to continue.
- .6 Except as outlined in GC 34 Delays, include costs for possible delay, inconvenience and coordination in Contract price.

**1.3 HOURS OF WORK**

- .1 The work may be performed 24 hours a day, 7 days a week, except as noted below. Regular working hours are from 06:30 hours and 17:00 hours.
- .2 Work may be subject to change or delays due to Airport operations, late flight arrivals etc.
- .3 The Town of Smithers may, at their discretion, restrict Work in certain areas of the Airport during peak operational hours or days.
- .4 Modify the work schedule when required by the Town of Smithers to accommodate on-going Airport operations.

**1.4 PERMITS AND LOCKOUT POLICY**

- .1 The Contractor will require Town of Smithers approval prior to proceeding with select construction activities including but not limited to lockout of existing building systems, coring and saw-cutting, excavation and trenching, hot work and crane/hiab operation. Town of Smithers approval will be given in the form of approved permits. Follow the procedures as outlined in the Construction Safety/Security Manual.

**1.5 WORK IN AIRSIDE AREAS**

- .1 The Airport will remain fully operational throughout construction including all existing runways, taxiways and service roads.
- .2 Wherever possible, Contractor shall be expected to erect secure approved temporary fencing at airside work, with groundside access only, so that the work can be deemed "groundside" and avoid airside construction restrictions.
- .3 Perform Work in the restricted area (Airside) in accordance with the rules and regulations of the authorities having jurisdiction. Refer to Section 01565 - Security.

- .4 Provide temporary protection for safe handling of public, personnel, pedestrians and vehicular traffic.
- .5 Provide barricades and lights where directed. Barricades and lights must be able to resist jet blast from aircraft within the operational areas of the Airport.
- .6 Clean up the Work daily, making sure to control all Foreign Object Debris (FOD) at the Site.
- .7 Travel to the Site will be restricted to dedicated route(s) approved by the Town of Smithers. Refer to Section 01550 - Vehicular Access and Parking.

#### **1.6 AIRCRAFT OPERATIONS**

- .1 Provide the Town of Smithers ten (10) days prior notice of requirement to undertake Work in areas of Airport not closed to aircraft traffic so that Town of Smithers can issue a Notice to Airmen (NOTAM).
- .2 The Town of Smithers has taken steps to minimize the jet blast and prop wash from taxiways and operating areas through the layout of facilities and changes to aircraft operating procedures. These measures will reduce but will not eliminate the impact of jet blast and prop wash on construction activities. Make all construction personnel aware through safety orientation, that routine aircraft operations can result in prop wash or jet blast that may affect their Work. Contractor to ensure that all Materials adjacent to taxiways resist jet blast through good compaction, the application of tack coat or any other method approved by the Town of Smithers.

#### **1.7 LOW VISIBILITY OPERATIONS**

- .1 To safely allow aircraft operations to continue when fog is present, the Town of Smithers will implement its Low Visibility Plan. Low Visibility conditions are most common during the autumn and spring months in morning hours due to "condensation fog".
- .2 When visibility conditions at the Airport is reduced below 2600 feet Runway Visual Range (RVR horizontal) and 500 feet ceiling, the Town of Smithers begins to prepare for operating in low visibility conditions (visibility below RVR1200). During this preparatory phase, the Contractor must be prepared to vacate the airfield within five (5) minutes notice or suspend their activities if the conditions deteriorate to RVR1200 or below.
- .3 When Low Visibility conditions are declared, complete cessation of all Work in the airfield can be expected; limited movement of vehicles around the terminal may also be required. The intent is to reduce aircraft-vehicle interactions and the limitations implemented will be dependent on a number of factors including, but not limited to, location, work activity, time of day and operational requirements.
- .4 The Contractor is to provide for Low Visibility events in their Contract price. No compensation will be made for suspension of Work periods or for periods of standby time during low visibility conditions.

#### **1.8 MOVEMENT OF EQUIPMENT AND PERSONNEL**

- .1 Refer to Section 01550 - Vehicular Access and Parking..
- .2 Prior to construction, provide Town of Smithers, for review, plan drawing detailing location of all proposed haul roads, ramps, access points, with associated timing requirements. Plan drawing requires approval of Town of Smithers prior to construction.
- .3 In areas of Airport not closed to aircraft traffic:



- .1 Obtain Town of Smithers's written approval on scheduling of Work.
- .2 Control movements of equipment and personnel as directed by security escort, Town of Smithers or air traffic control tower.
- .3 Provide competent flag persons at locations designated by Town of Smithers to relay signals from escort or Airport traffic control tower to equipment and personnel wishing to cross live traffic areas.
- .4 Signals from Airport traffic control tower to be obeyed instantly.
- .5 Any Contractor's employee who fails to obey an instruction or signal from the escort or air traffic control tower or who disregards any such instruction will have his security pass revoked and will no longer be permitted in the restricted area.
- .6 Ensure Site, including haul route, is clean and free from litter and debris at all times. Litter and debris not cleaned up immediately will be removed by Town of Smithers at Contractor's expense.
- .7 Immediately stop Work and move men and equipment clear of aircraft operating areas when instructed to do so, or when aircraft are passing.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01141

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 CHANGES IN THE WORK**

- .1 Comply with GC 44 Changes In The Work and GC 45 Force Account Payment.
- .2 Changes to the Work are defined as below and documented using the following forms:
  - .1 **Field Work Order (FWO):**
    - .1 Will be used when an instruction is given to the Contractor in the field which may result in an adjustment to the Contract Price.
    - .2 A FWO signed by the Town of Smithers is authorization to proceed with the Work on a Lump Sum, Unit Price or Time and Material basis as stipulated on the FWO form.
    - .3 Changes to the Work shall not commence until the Contractor receives a copy of the FWO signed by the Town of Smithers.
  - .2 **Field Memo (FM):**
    - .1 Will be issued by the Consultant and be used as an instruction or clarification where the change is not anticipated to result in an adjustment to the Contract Price.
    - .2 Field Memos include Site Instructions, Supplemental Instructions or the like issued by the Town of Smithers or the Consultant.
  - .3 **Change Order (CO):**
    - .1 Will be used for additions or deletions to the Contract Price which originated in the form of revisions to both Drawings and Specifications.
    - .2 A Change Order signed by the Consultant and the Town of Smithers is authorization to proceed with the Work as stipulated on the form.
    - .3 Changes to the Work shall not commence until the Contractor receives a copy of the Change Order signed by the Town of Smithers.
  - .4 **Daily Time Sheet (DTS) Form:**
    - .1 DTS forms are to be used to evidence Work performed on a Time and Material/Force account basis and must be submitted the next working day after Work is performed and must be authorized before payment can be made.
- .3 **Contemplated Changes in the Work (CCO)**
  - .1 Where a Change in the Work is contemplated, the Town of Smithers and/or Consultant will issue a Contemplated Change Order. **Such notice is for information only and is not an instruction to perform changes nor to stop Work in progress.** The Contractor's quotation shall:
    - .1 Make reference to the contemplated change order letter and reference

- number;
  - .2 Be set out in sufficient detail acceptable to the Consultant;
  - .3 Advise if the contemplated change will have any impact on the Construction Schedule. If no notice is given, it will be assumed that there is no impact on the Construction Schedule;
  - .4 Indicate that quotation/estimates will remain open for acceptance by the Town of Smithers for thirty (30) days;
  - .5 Indicate cost impact and submit all required supporting documents; and
  - .6 Be issued to the Town of Smithers and Consultant not more than seven (7) days after receipt of Contemplated Change Order.
- .2 The Town of Smithers and Consultant will review quotations for contemplated changes in Work to determine whether quotation is acceptable, requires resubmittal or should be rejected.
- .3 When the quotations have been evaluated and are acceptable, the Consultant will prepare and complete a Change Order entering the acceptable quotation/estimate adjustments to the Contract Price and Contract Schedule for the Town of Smithers's signature. Once the Change Order is signed and fully executed by the Town of Smithers, it will then be forwarded to the Contractor for signature, his records and authorization to proceed with the Work.
- .4 **Lump Sum Change Orders and Field Work Orders**
- .1 The content of Change Orders and Field Work Orders will be based on a prior quotation approved by the Town of Smithers.
  - .2 The Contractor must submit all necessary supporting documentation broken down in as much detail as required by the Town of Smithers and/or Consultant to approve the quotation offered by the Contractor.
- .5 **Unit Price Change Orders and Field Work Orders**
- .1 The content of Change Orders or Field Work Orders will be based on either prior agreed quantities or a survey of completed Work.
  - .2 When quantities **can be determined** prior to start of Work, the Consultant will prepare and complete a Change Order or Field Work Order describing the Work and entering the agreed confirmed unit prices, total net increase in quantities and total cost adjustments to the Contract Price and Contract Time for the Town of Smithers's signature. Once the Change Order or Field Work Order is signed and fully executed by the Town of Smithers, it will then be forwarded to the Contractor for signature, his records and authorization to proceed with the Work.
  - .3 When quantities **cannot be determined** prior to start of Work, the Town of Smithers or Consultant will assign to the Contractor a Field Work Order signed by the Town of Smithers agreeing and authorizing the described Work to proceed immediately on the basis of the unit prices and an estimate mutually agreed upon. Upon completion of the changes involved, the Consultant will complete the Field Work Order entering the final total cost of the Work based on agreed confirmed unit prices and actual Site measured quantities and support data submitted for the Town of Smithers's signature to adjust the Contract Price as applicable.
- .6 Overhead, Profit and Fee applied to Changes:

- .1 Comply with GC 44 Changes in the Work.
- .2 Additionally:
  - .1 If a Change in the Work includes a Labour and Materials net extra to the Contract, the Subcontractor and Contractor overhead, profit and fee mark-ups shall be applied to the difference between Labour and Materials net credits and net extras.
  - .2 If a Change in the Work includes a Labour and Materials net credit to the Contract, the Subcontractor and Contractor overhead, profit and fee mark-ups will neither be credited nor added.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01250

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 REQUIREMENTS INCLUDED**

- .1 Comply with GC 37 Co-ordination of the Work.
- .2 The Contractor shall coordinate the Work of its consultants, Subcontractors and such Assigned Contractors for whom the Contractor has assumed responsibility for scheduling, safety, security, coordination and performance of the Work.
- .3 Except as specifically provided for in other sections of the Specifications, the Consultant and Contractor shall respond promptly in all matters concerning the Work and each shall be afforded a reasonable amount of time to respond to the communication received from the other. Response time of up to five (5) working days is considered reasonable.
- .4 The Contractor shall:
  - .1 Coordinate, manage, direct and supervise Work of its own employees, consultants, Subcontractors and Assigned Contractors;
  - .2 Expedite the Work to assure compliance with all its own schedules and those of Other Contractors.
  - .3 Comply with orders and instruction of the Consultant, Town of Smithers and authorities having jurisdiction.
  - .4 Coordinate its Work with the work of Other Contractors on the Site.
- .5 Where the work of any trade will be installed in close proximity to, or will interfere with, existing work or the work of other trades, make necessary modifications under the direction of the Contractor and to the Consultant's approval, at no additional cost to the Owner.
- .6 Additional costs to remove, replace, correct and/or modify the work of trades to achieve proper coordination shall be paid by the Contractor.

**1.3 TOWN OF SMITHERS PROJECT MANAGER**

- .1 The Town of Smithers will appoint a Project Manager. All correspondence and authorizations will be distributed through the Consultant.

**1.4 CONSTRUCTION ORGANIZATION AND START-UP**

- .1 The Contractor shall establish on-site lines of authority and communications and shall:
  - .1 **Meetings**
    - .1 Schedule, conduct and/or attend meetings as specified.
  - .2 **Interpretation of the Contract Documents**
    - .1 Consult with the Consultant to obtain interpretation.

- .2 Expedite resolution of questions or conflicts which may arise.
- .3 Transmit written interpretations to Subcontractors and to other concerned parties.

**.3 Use of the Site**

- .1 Allocate space for field office, lunchroom, sheds, Work and storage areas within areas established in coordination with Other Contractors on Site and by the Town of Smithers.
- .2 Regulate use of the Site during the Work.

**.4 Town of Smithers' Construction Safety/Security Program**

- .1 All workers shall be orientated in the Town of Smithers' Construction Safety/Security program by the Contractor prior to commencement of Work on Site.

**1.5 CONTRACTOR'S DUTIES**

**.1 Construction Schedules**

- .1 Comply with GC 28 Construction Schedule.
- .2 Prepare a detailed schedule of construction operations as specified under these Specifications.
- .3 Coordinate with the schedules of Other Contracts.
- .4 Coordinate the schedules of Contractor's consultants, Subcontractors, Assigned Contractors and Suppliers for which the Contractor is responsible.
- .5 Monitor schedules as Work progresses:
  - .1 Identify potential variances between scheduled and actual progress for each phase and determine how the completion date will be met.
  - .2 Recommend to the Consultant and Town of Smithers adjustments in the Work program to meet required completion dates.
  - .3 Monitor and adjust Work programs of the Subcontractors, Suppliers and Other Contractors for which the Contractor is responsible for as required.
  - .4 Document changes in the Schedule, submit to the Consultant and to other parties involved.
  - .5 Provide Schedule updates and progress monitoring on a regular basis.
- .6 Oversee Work of Subcontractors and Assigned Contractors for which the Contractor is responsible to monitor compliance with the Schedule:
  - .1 Verify that labour and equipment are adequate for the Work and the schedule.
  - .2 Verify that product procurement schedules are adequate.
  - .3 Verify that product deliveries are adequate to maintain schedule.

- .4 Ensure all work is completed on schedule.

**.2 Submittals**

- .1 Refer to Section 01330 - Submittal Procedures for submittal procedures.
- .2 Receive and review all shop drawings, product data and samples for conformity with Contract Documents prior to forwarding to the Consultant for review in accordance with GC 5 Shop Drawings and As Built Drawings and Section 01330 - Submittal Procedures.
- .3 Review shop drawings, product data and samples prepared by assigned contractors for scheduling and coordination with the Work and bring to the attention of the Consultant any conditions which would affect the Work of this Contract.
- .4 Establish schedule for the submission, review and return of submittals.

**.3 Inspection and Testing**

- .1 Inspect Work to assure performance in accordance with requirements of Contract Documents. Conform to the requirements of Section 01450 - Quality Control.
- .2 Reject and remedy Work which does not comply with requirements of Contract Documents.
- .3 Coordinate testing laboratory services:
  - .1 Verify that required laboratory personnel are present.
  - .2 Verify that tests are made in accordance with specified standards.
  - .3 Review test reports for compliance with specified criteria.
  - .4 Recommend and administer any required re-testing.

**.4 Changes and Substitutions**

- .1 Recommend to the Consultant necessary or desirable changes and their values.
- .2 Review Subcontractor's requests for changes and substitutions; submit to the Consultant recommendations and their values.
- .3 Prepare requests for price quotations.
- .4 Promptly notify the Consultant of pending changes or substitutions.

**.5 Reports and Records at Site**

- .1 Maintain a daily log of progress of the Work subject to access by the Consultant or Town of Smithers.

**1.6 CONTRACTOR'S CLOSE-OUT DUTIES**

**.1 Equipment Start-up**

- .1 Coordinate checkout of utilities, operational systems and equipment.

- .2 Assist in initial start-up and testing.
- .3 Record dates of start-up of operation of systems and equipment.
- .4 Correct and resolve problems incurred at start up without delaying schedule.
- .5 Comply with Town of Smithers's equipment tagging system and Turnover Procedures Manual.

**.2 Performance Test**

- .1 Conduct performance test in accordance with agreed test procedures.
- .2 Operate and maintain equipment while in use. Repair and/or upgrade as required.

**.3 Completion of Work**

- .1 Conduct an inspection to ensure specified cleanup has been accomplished.
- .2 Ensure temporary facilities and equipment have been removed from Site.

**.4 Substantial Performance**

- .1 When the Contractor considers that the Work is substantially performed and has submitted its application for a Certificate of Substantial Performance, conduct an inspection of the Work with the Town of Smithers and Consultant to identify and list Work to be completed or corrected.
- .2 Supervise correction and completion of Work.

**.5 Total Performance**

- .1 When the Contractor considers that Work is totally performed and has submitted its application for a Certificate of Total Performance, conduct a review of the work with the Town of Smithers and Consultant.
- .2 Assist the Town of Smithers and Consultant in their reviews.

**.6 Administration of Contract Close-out**

- .1 Receive and review final submittals.
- .2 Transmit to the Consultant and Town of Smithers.
- .3 Comply with Section 01770 - Closeout Procedures.

**1.7 PRE-CONSTRUCTION MEETING**

- .1 Within five (5) days after award of Contract, attend a meeting to discuss and resolve administrative procedures and responsibilities.
- .2 Representatives of the Town of Smithers, Consultant, Contractor, Subcontractors and field inspectors will be in attendance.
- .3 The Town of Smithers will establish the time and location of the meeting and notify parties concerned.



## **1.8 PROGRESS MEETINGS**

- .1 Throughout the progress of the Work, attend progress meetings on weekly basis.
- .2 The Contractor, Subcontractors involved in the Work, Consultant and Town of Smithers representatives are to be in attendance.

## **1.9 CONSULTANT'S MEETING RESPONSIBILITIES**

- .1 The Consultant will:
  - .1 Preside at meetings called for the purposes of addressing design issues or other such matters as determined from time to time.
  - .2 Record, reproduce and distribute copies of the minutes of meetings presided over to include significant proceedings and decisions.
  - .3 Attend construction progress meetings and be prepared to discuss items related to the progress of the Work.
- .2 Representatives of subconsultants shall attend progress meetings as required and be qualified and authorized to act on behalf of the entity each represents.

## **1.10 CONTRACTOR'S MEETING RESPONSIBILITIES**

- .1 The Contractor will:
  - .1 Preside at meetings called for the purposes of addressing construction issues or other such matters as determined from time to time.
  - .2 Record, reproduce and distribute copies of the minutes of meetings presided over to include significant proceedings and decisions.
  - .3 The Contractor shall attend all scheduled meetings and be prepared to discuss the progress of the Work including but not limited to the following:
    - .1 Safety and Security.
    - .2 Review actual Work progress against Construction Schedule, including any delay problems and how the Contractor intends to correct or resolve the delays.
    - .3 Coordination with Other Contractors working on Site.
    - .4 Review critical Work sequences and operational impacts to the Airport.
    - .5 Schedule of required submittals, including identification of priority and urgently required submittals.
    - .6 Review progress of submittal reviews.
    - .7 Review deliveries, delays, substitutions, colour samples, including potential delivery and/or delay problems and how it intends to correct or resolve.
    - .8 Review and discuss on a regular basis to ensure "as-built" drawings are continuously kept current.
    - .9 Review of Site Instructions, Contemplated Changes to the Work, Field

Work Orders and Change Orders.

- .10 Review of Applications for Payment.
- .11 Review of any observations, requests for clarification, problems, conflicts and coordination which may impede progress of the Work.
- .2 Representatives of Subcontractors, Assigned Contractors and Suppliers shall attend contract review meetings as required and be qualified and authorized to act on behalf of the entity each represents.
- .3 The Contractor shall hold regular Site meetings with Subcontractors. The Town of Smithers shall be permitted to attend such meetings on request. Provide copies of all meeting minutes to the Town of Smithers.
- .4 All of the Contractor's and its Subcontractor's workers and Assigned Contractors shall attend a meeting jointly held by the Town of Smithers and the Contractor to orientate and indoctrinate the workers into the Site Safety and Security Program.
- .5 The Contractor will advise and cooperate with the Consultant in the preparation of agenda, issues for resolution and, at all times, act in good faith to ensure that Project meetings are informative and used to expedite the Work.
- .6 The Contractor shall be adequately prepared to discuss progress and monitoring information.

#### **1.11 TOWN OF SMITHERS'S MEETING RESPONSIBILITIES**

- .1 The Town of Smithers will:
  - .1 Preside at meetings called for the purposes of addressing operational issues or other such matters as determined from time to time.
  - .2 Record, reproduce and distribute copies of the minutes of meetings presided over to include significant proceedings and decisions.
  - .3 Attend construction progress meetings and be prepared to discuss items related to the progress of the Work.

#### **2.0 PRODUCTS**

Not applicable.

#### **3.0 EXECUTION**

Not applicable.

END OF SECTION 01310

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 REQUIREMENTS**

- .1 Comply with GC 28 Construction Schedule.

**1.3 SCHEDULES REQUIRED**

- .1 Submit the following schedules:
  - .1 Construction Schedule.
  - .2 Submittal schedule for shop drawings, product data, samples and maintenance manuals.
  - .3 Projected manpower curve, including security guard requirements.
  - .4 Cash flow curve.
  - .5 Percentage complete curve (derived from the schedule of values) on weekly basis with separate curves for the Project as a whole and on major phases or work areas.
  - .6 Scope of Subcontractor Work and Subcontractor monitoring schedule.
  - .7 Equipment list for each phase and stage of the Work.
  - .8 Submittal schedule for Project closeout.

**1.4 CONSTRUCTION SCHEDULE FORMAT**

- .1 Prepare schedule in the form of a horizontal bar chart using the Primavera or MS Project computer-based scheduling system. The Town of Smithers may request submittals in other formats at their option.
- .2 Provide horizontal time scale identifying the first work day of each week.
- .3 The phasing identified in the Contract Documents is to be maintained and adopted by the Contractor. Show activity description, dates and an activity bar for each activity for each phase. Include construction milestones as outlined in Section 01115 - Project Schedule Milestones.
- .4 The Contractor shall use sub-headings to break the Construction Schedule into appropriate areas of Work, and provide a separate bar for each trade of operation under these sub-headings. Include the complete sequence of construction activities and identify extended work hours and night work. The level of detail of the Construction Schedule shall be such that the Contractor's strategy is clearly and unambiguously presented and such that progress can be accurately monitored on a weekly basis.
- .5 In the event of a major issue during construction, the Construction Schedule may need to be revised and resubmitted. In this event, the Contractor shall show changes occurring since previous submission of the Schedule:
  - .1 Major change in scope.

- .2 Activities modified since previous submission.
- .3 Revised projections of progress and completion.
- .4 Other identifiable changes.

#### **1.5 SCHEDULE SUBMISSIONS**

- .1 Initial schedules shall be submitted for approval within fourteen (14) days of award of the Contract.
- .2 Town of Smithers will review the schedules submitted and return a review copy within ten (10) days of receipt.
- .3 Finalized schedule shall be resubmitted within ten (10) days of receipt of the review copy. Once the schedules are agreed, they shall be set up as the baseline schedule for use as a comparison of actual to planned progress.
- .4 Copies of the finalized schedules shall be distributed as follows:
  - .1 Town of Smithers.
  - .2 Consultant.
  - .3 Site office.
  - .4 Subcontractors and Suppliers.
  - .5 Other concerned parties.
  - .6 Others as requested by Town of Smithers.
- .5 Submit updated Construction Schedule for each progress meeting. Updates shall indicate progress of each activity and identify any changes to the schedule through comparison to the baseline(s). In the event of delays to the schedules, the Contractor shall specify the impact of the delay and how the time will be recovered, if necessary.

#### **2.0 PRODUCTS**

Not applicable.

#### **3.0 EXECUTION**

Not applicable.

END OF SECTION 01320

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 REQUIREMENTS**

- .1 Provide submittals listed in the Specifications sections for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in the Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 All submittals must be under a transmittal.
- .3 Work affected by the submittal shall not proceed until review is complete.
- .4 Review submittals prior to submission to the Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of the Work and the Contract Documents. Submittals not stamped, signed, dated and identified will be returned without being examined and shall be resubmitted when completed.
- .5 Coordinate each submission with requirements of the Work and the Contract Documents. Individual submission will not be reviewed until all related information is available.
- .6 Verify field measurements and affected adjacent Work are coordinated.
- .7 The Contractor's responsibility for errors and omissions in submission is not relieved by the Consultant's review of submittals.
- .8 The Contractor's responsibility for deviations in submission from the requirements of Contract Documents is not relieved by the Consultant's review of submittals, unless a deviation on the submittal is noted as such in writing and has been approved by the Consultant.
- .9 Keep one (1) reviewed copy of each submittal on Site.
- .10 Provide at least one (1) copy of every submittal to the Town of Smithers, additional copies may be requested.
- .11 All submittals shall be legible and in the English language.
- .12 All submittals shall be in SI Metric units. Where items or information are not produced in SI Metric units, converted values are acceptable.
- .13 Allow minimum ten (10) working days for the Consultant and Town of Smithers to review submittals from the date they are received.

**1.3 CONSTRUCTION METHODOLOGY**

- .1 The Contractor shall submit a descriptive outline and other appropriate documents (sketches, drawings, checklists, etc.) describing the proposed construction methodology as required in the Contract Documents.

**1.4 SHOP DRAWINGS AND PRODUCT DATA**

- .1 Within fourteen (14) days of award of Contract, the Contractor shall submit a listing and

overall schedule for all shop drawings and product data which it intends to submit for approval. This schedule shall reflect each individual item, the date shop drawings will be submitted and the date upon which approval will be required in order to comply with the Construction Schedule. Spread out the shop drawing submission dates by schedule so as not to overload the Consultant with submission of drawings all at one time. The shop drawing submission schedule shall be a 'living document' and shall be updated monthly to reflect the most current information.

- .2 Shop drawings: original drawings or modified standard drawings provided by the Contractor to illustrate details of portions of the Work that are specific to the Project requirements.
- .3 Product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams used to illustrate standard manufactured products and MSDS where applicable.
- .4 Submissions shall include a transmittal letter containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .5 Submissions shall include:
  - .1 Data and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractors' authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions or Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
    - .3 Setting or erection details.
    - .4 Capacities.
    - .5 Performance characteristics.
    - .6 Standards.

- .7 Operating weight.
- .8 Wiring diagrams.
- .9 Single line and schematic diagrams.
- .10 Relationship to adjacent work.
- .6 Indicate Materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Indicate cross references to the Drawings and Specifications.
- .7 Submit eight (8) prints of shop drawings for each requirement requested in Specification sections.
- .8 Submit six (6) copies of product data sheets or brochures for the requirements requested in Specification sections where shop drawings will not be prepared due to standardized manufacture of product. Product data sheets will only be accepted if information not applicable to the Project is deleted, additional information is provided as required to supplement standard information, dimensions, clearances, performance characteristics, capacities, wiring diagrams and controls are shown.
- .9 Adjustments made on submissions by the Consultant are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Consultant and obtain written approval from the Town of Smithers prior to proceeding with the Work.
- .10 Make changes in submissions as the Consultant may require, consistent with Contract Documents, and resubmit as required. When resubmitting, notify the Consultant in writing of any revisions other than those requested.
- .11 The Contractor shall not commence fabrication until receipt of the shop drawings or product data which have had their final review by all applicable consultants.

## **1.5 SAMPLES**

- .1 Comply with GC 13 Samples and Testing.
- .2 Submit samples in sizes and quantities as requested in the Specifications. Submit full range of colours where colour samples are called for.
- .2 Label samples as to origin and intended use in the Work.
- .3 Deliver samples prepaid to the Consultant's and the Town of Smithers's office.
- .4 Notify the Consultant in writing, at the time of submission of deviations in samples from the requirements of Contract Documents.
- .5 Ensure that items/materials are available in quantities required to complete the Work, as no change or substitution will be permitted after a sample has been reviewed unless a request for change or substitution has been given in writing by the Contractor and the review process is repeated.
- .6 Adjustments made on samples by the Consultant are not intended to change the Contract Price. If adjustments affect value of Work, state such in writing to the Consultant and obtain written approval from the Town of Smithers prior to proceeding with the Work.
- .7 Make changes in samples which the Consultant may require, consistent with Contract

Documents.

- .8 Approved samples will become standards of workmanship and Material against which installed Work will be checked. If any of the Work is not of the same quality, material, finish, colour, texture or appearance as the sample, the portion that is not the same will be considered defective and in nonconformance.
- .9 Store approved samples on Site, accessible at all times and clearly labeled according to Specification section number, description, date of submission and approval.

#### **1.6 INSTALLATION, OPERATING AND MAINTENANCE MANUALS**

- .1 Comply with GC 24 Start-up Assistance and Operating Documents.
- .2 Provide manuals for each division of the Specifications in the identical format as that required per Section 01335 - Installation Operating and Maintenance Manuals, including similar content as applicable, organizing contents into applicable categories of Work, parallel to Specifications divisions and sections.
- .3 Include installation, operating and maintenance data for all equipment and materials provided under Assigned Contracts and equipment and material supplied by the Town of Smithers to the Contractor for installation.
- .4 Submission of the installation, operating and maintenance manuals shall be progressive and managed similar to shop drawings. Submit to the Consultant and Town of Smithers the following at dates agreed to by the Town of Smithers:
  - .1 Title page and spine mock-up. Electronic submission is acceptable.
  - .2 Table of contents. Electronic submission is acceptable.
  - .3 First draft of the hard copy manual(s) for all applicable disciplines with pages inserted noting information or documents to follow. One (1) copy shall be submitted to the Town of Smithers.
  - .4 Second draft of the hard copy manual(s) for all applicable disciplines, which is to be considered the final draft subject only to final inspection notices and warranties submitted for Substantial Performance of the Work, and first draft of the digital manual. One (1) copy shall be submitted to the Town of Smithers.
  - .5 Finalized hard copy and digital manual(s) for all applicable disciplines, which is to be considered the final version at turn-over of an area or Substantial Performance of the Work, whichever is earlier. All required copies of the manual(s) shall be submitted to the Town of Smithers.

#### **1.7 SCHEDULE OF SUBMITTALS**

- .1 The following is a checklist, for convenience only and does not relieve the Contractor from providing submittals not listed herein but required elsewhere in the Specifications.
- .2 Provide to the Town of Smithers prepaid to their offices the following within fourteen (14) days of Contract award:
  - .1 Performance Bond and Labour and Material Payment Bond required by the Town of Smithers – one (1) copy.
  - .2 Copies of the Contractor's insurance as called for under GC 29 Insurance – one (1) copy.



- .3 List of corporate signing officers – one (1) copy.
- .4 Construction Schedule – see Section 01320 – four (4) copies.
- .5 Schedule of values – two (2) copies.
- .6 Schedule of shop drawings – two (2) copies.
- .7 Contractor's company safety policy and all Subcontractor's company safety policies – two (2) copies.
- .8 List of trailers, laydown area plan, survey needs and other special needs. Contractor shall submit a list of its requirements within fourteen (14) days of award of Contract – two (2) copies.
- .9 Emergency plans and procedures, spill preventions program and clean-up and waste removal plan – two (2) copies.
- .10 Material Safety Data Sheets for all hazardous Materials that will be used in the Work – two (2) copies.
- .11 Waste and Recycling Management Plan – see Section 01355 – two (2) copies.
- .12 Hazardous Materials Plan – see Section 01905 – two (2) copies.
- .13 Quality Control Plan – see Section 01450 – five (5) copies.
- .3 Provide one (1) copy to the Town of Smithers prepaid to their offices the following prior to making application for first payment:
  - .1 Letter from WCB and from respective departments representing Canada Pensions, Employment Insurance and Federal Income Tax stating that the Contractor and all Subcontractors are in good standing.
  - .2 Construction Schedule updated with current progress including progress scheduled dates for submission of shop drawings and samples.
  - .3 List of all plumbing fixtures, equipment and fittings proposed to be installed for approval prior to ordering.
  - .4 List of all mechanical equipment proposed to be installed for approval prior to ordering.
  - .5 List of all electrical fixtures and equipment proposed to be installed for approval prior to ordering.
  - .6 List all applicable mechanical, electrical, permits.
- .4 Provide one (1) copy to the Town of Smithers and one (1) copy to the Consultant of the following during progress of the Contract:
  - .1 Schedule of dates for receiving material and equipment supplied by the Town of Smithers.
  - .2 Report on condition of material and equipment supplied by the Town of Smithers within seven (7) days of receipt on Site.
  - .3 Methodologies for all major Work activities.

- .4 Shop drawings, as required by the Specifications.
- .5 Samples, as required by the Specifications.
- .6 Test reports.
- .7 Monthly Statutory Declaration in a form approved by the Town of Smithers that all wages, accounts for Materials, Sub-contractors and Suppliers have been paid in accordance with GC 46 Payments and Certificates.
- .8 Letter from WCB stating that contractor and Subcontractors are in good standing.
- .9 Minutes of meetings with Subcontractors and "tool box" meetings.
- .10 Monthly accident statistical breakdown including accident frequency and accident severity rates.
- .11 WCB reports.
- .12 Accident investigations.
- .13 Installation, operating and maintenance manuals.
- .5 Refer to Section 01780 - Closeout Submittals for details of documents required to be submitted at Substantial Performance of the Work and Total Performance of the Work.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01330

**1.0 GENERAL****1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 GENERAL REQUIREMENTS**

- .1 Comply with GC 24 Start-up Assistance and Operating Documents.
- .2 Refer to Section 01330 - Submittal Procedures and Section 01780 - Closeout Submittals.
- .3 Refer to Section Manuals shall contain pertinent maintenance, operational and installation instruction information on equipment, Materials cleaning and lubrication schedules, filters, overhaul, replacement, adjustment schedules, and emergency procedures as applicable so as to guide the Town of Smithers in the proper operation and maintenance of building Material, components, equipment and systems.
- .4 Include installation, operating and maintenance data for all equipment and materials provided under Assigned Contracts and equipment and material supplied by the Town of Smithers to the Contractor for installation.
- .5 Provide manuals for each division of the Specifications in the identical format such that they appear to be of the same origin. Title pages and spines will be identical except for the applicable discipline content.
- .6 The Contractor shall coordinate the manuals of all Subcontractors and Assigned Contracts to ensure the proper number of volumes are provided such that each of the manual binders are filled to a reasonable capacity.
- .7 All information shall be provided in the English language and be legible.
- .8 All documents shall be inserted such that all information is visible. Documents larger than letter format shall be folded such that no part of the document is protruding from the manual binder edge.
- .9 All oversize drawings shall be folded such that the drawing title is visible and inserted utilizing closeable 'pockets' such that the drawing can be removed for viewing and replaced without removing additional content from the manual binder.
- .10 Provide manuals for each division of the Specifications in hard copy and digital formats, as outlined below.

**1.3 HARD COPY BINDER FORMAT**

- .1 Five (5) copies of each volume of the manual(s) shall be provided to the Town of Smithers. All original documents shall be included in the same binder and this binder shall be labeled as "ORIGINAL" on the title page.
- .2 All manuals shall be provided in a custom made expandable binder to suit the volume of information to be included in the binder. The binder shall be sized to fit letter format paper, have a heavy-duty dark green levant exterior with gold foil stamped lettering on the front and spine. Binders are available in 2-4" and 3-5" expandable format from Ringbinder.com & Menu by Design (Phone: 604-872-8132; Tollfree: 1-800-670-2463).
- .3 Where the content to be included in the manual binder is not enough to fill the custom expandable binder, application can be made to the Town of Smithers to substitute a

standard heavy duty catalogue three-ring binder in lieu of the custom binder. The standard catalogue binder shall be white and equipped with clear plastic sleeves on the front and spine.

- .4 Each binder shall be indexed with custom made tab dividers showing the section title and sequentially numbered colour index tabs of laminated Mylar plastic. Tab colours shall be as outlined below. Custom tabs are also available from Ringbinder.com & Menu by Design (Phone: 604-872-8132; Tollfree: 1-800-670-2463).
- .5 The front of each binder shall be printed with the following information in capital letters:
  - .1 "SMITHERS REGIONAL AIRPORT".
  - .2 Project name.
  - .3 Town of Smithers's project number.
  - .4 Town of Smithers's permit number.
  - .5 Applicable discipline(s) followed by "Operating and Maintenance Manual".
  - .6 Volume number, if applicable.
  - .7 Year the manual was prepared, which should also be the year the project was turned over to the Town of Smithers.
  - .8 Coordinating Consultant's company name.
  - .9 Applicable design Consultant's company name.
  - .10 Applicable Contractor of Subcontractor's company name.
- .6 The spine of each binder shall be printed with the following information in capital letters:
  - .1 "SMITHERS REGIONAL AIRPORT".
  - .2 Project name.
  - .3 Town of Smithers's project number.
  - .4 Town of Smithers's permit number.
  - .5 Applicable discipline followed by "Operating and Maintenance Manual".
  - .6 Volume number, if applicable.
  - .7 Year the manual was prepared, which should also be the year the project was turned over to the Town of Smithers.
- .7 Content and organization of the manual shall be as outlined below.

#### **1.4 DIGITAL COPY FORMAT**

- .1 The digital and hard cover versions of the manuals are to be prepared by the same company, or approved equal.
- .2 Two (2) copies of all installation, operating and maintenance information shall be provided in digital format.
- .3 Organize the information into sections in a user-friendly format to search for specific

information. Provide an indexing system that remains on an expandable portion of the screen that allows the user to scroll through the manual information that appears on the main portion of the screen. The content and organization for each digital copy of the manual shall be arranged identical to the hard copy version.

- .4 The digital requirements are as follows:
  - .1 Utilize Adobe Acrobat Portable Document Format (PDF), latest version.
  - .2 If there is more than one volume of manual, indicate "Volume X of Y" for each volume.
  - .3 The final digital copies of the manual(s) are to be copied to CD or DVD with a custom label.
  - .4 The custom label shall include the same information as the hard copy binder spine.
  - .5 The digital manual shall be enhanced with the following features: bookmarks, thumbnails, internet links, internal document links and Optical Character Recognition (OCR).
  - .6 PDFs shall be produced from or include original Excel, Word and HTML (web browser) files, rather than scanned printed copies of the documents (i.e. use PDF printer for Word, Excel, etc. to produce documents). When available, download documentation from manufacturer's internet site and include in the digital copy of the manual rather than scanning a hard copy of the same document.
  - .7 Refer to Scanning Requirements and Organizational Requirements as follows.
    - .1 Scanning Requirements:
      - .1 All pages contained within the hard copy manual are to be scanned and/or digitized to Adobe Acrobat 8 PDF.
      - .2 Provide a minimum 300 DPI for all scanned pages.
      - .3 All scanned shop drawings may be searched for text with minimum 70% Optical Character Recognition (OCR).
      - .4 All shop drawings are to be scanned to a minimum 216mm x 280mm size but shall retain the original size of the document. (For example, if the original page size is 280mm x 430mm, the digital copy shall also be 280mm x 430mm.)
      - .5 Rotation of scanned page images/texts shall be displayed within +/- 5 degrees.
    - .2 Organizational Requirements:
      - .1 The digital manual shall be organized and colour coded in the same manner as the approved hard copy manual.
      - .2 Bookmark all major tabs/sections and subsections.
      - .3 Bookmark each set of shop drawings.
      - .4 Link the table of contents page to the referenced sections.

- .5 Insert an introduction/summary page for all sections indicating major subsections. Link these pages to their referenced sections.
- .6 Link the system descriptions to the referenced schematic drawings.
- .7 Insert internet links and internal document links from relevant sections to equipment manufacturers, suppliers, contractors official websites, equipment shop drawings.
- .8 Use the following color code for links:
  - .1 Internet links – light blue with underline.
  - .2 Internal document link – dark blue (excludes AutoCAD schematic links).
- .9 Insert a title page for each major piece of equipment. The title page shall include the shop drawing name and a link (dark blue in colour) to the appropriate section.
- .8 It is the responsibility of the Contractor to provide high quality documentation for scanning.
- .9 The digital manual shall be reviewed by the Consultant and the Town of Smithers for content and layout prior to final submission.

## 1.5 CONTENT AND ORGANIZATION

- .1 The Contractor shall provide proper documentation and instruction to Town of Smithers in installation, operation and preventative maintenance of architectural, mechanical and electrical equipment and systems.
- .2 Provide all data, corrected and final shop drawings, etc. as required for inclusion in the installation, operation, and maintenance manuals to the agency preparing the manuals.
- .3 Manual tab colours shall be white.
- .4 The following organization and indexing system shall be used:
  - .1 **Title Page**  
Provide a title page that duplicates the front cover of the manual.
  - .2 **Project Directory**  
Provide a project directory including the name, address, phone and fax number of the owner, architect, mechanical and electrical consultant, general Contractor, Subcontractors, manufacturers and Suppliers (including the firm preparing the manuals).
  - .3 **Main Index**  
Provide under separate tab a main index that covers content across all volumes of the manual. The main index should indicate which volume to locate each of the subsequent sections of the manual.
  - .4 **Instructions**

Provide under separate tab step by step instructions on how to use the manual.

.5 **Equipment Tagging Log**

Provide under separate tab fully executed equipment tagging log.

.6 **Spare Parts List**

Provide under separate tab fully executed spare parts list, including information on part number/code, quantity, etc.

.7 **Warranty**

Provide under separate tab the Project warranty certificate.

.8 **Architectural Finishes**

Provide under separate tab all manufacturer's equipment, Materials, products, data, details, identification, lists, schedules of maintenance, operational and installation instruction information as required in accordance with the various sections of the Specification. Organization of the sub-index shall be approved by the Town of Smithers prior to compiling the first draft of the hard copy manual.

.9 **Mechanical Systems**

Provide under separate tab all manufacturer's equipment, Materials, products, data, details, identification, lists, schedules of maintenance, operational and installation instruction information as required in accordance with the various sections of the Specification. Organization of the sub-index shall be approved by the Town of Smithers prior to compiling the first draft of the hard copy manual.

.10 **Electrical Systems**

Provide under separate tab all manufacturer's equipment, Materials, products, data, details, identification, lists, schedules of maintenance, operational and installation instruction information as required in accordance with the various sections of the Specification. Organization of the sub-index shall be approved by the Town of Smithers prior to compiling the first draft of the hard copy manual.

.11 **Security Systems**

Provide under separate tab all manufacturer's equipment, Materials, products, data, details, identification, lists, schedules of maintenance, operational and installation instruction information as required in accordance with the various sections of the Specification. Organization of the sub-index shall be approved by the Town of Smithers prior to compiling the first draft of the hard copy manual.

.12 **Communications Systems**

Provide under separate tab all manufacturer's equipment, Materials, products, data, details, identification, lists, schedules of maintenance, operational and installation instruction information as required in accordance with the various sections of the Specification. Organization of the sub-index shall be approved by the Town of Smithers prior to compiling the first draft of the hard copy manual.

- .5 Each section of the manual shall contain a sub-index of the following information, where applicable:

- .1 Description of the system.
- .2 Maintenance instruction.
- .3 Commissioning settings.
- .4 Approved shop drawings.
- .5 Test reports and certificates as applicable, including Letters of Assurance for professionals engaged by the Contractor or Subcontractor.
- .6 Supplier, manufacturer and/or distributor information.
- .7 Extended guarantees, warranties, certificates, etc.
- .6 The Contractor and Subcontractors shall cooperate fully to furnish sufficient copies of all relevant documentation to the company preparing the manuals to meet the above requirements.
- .7 Submit documents to Consultant for review before compiling into the manual submitted to the Town of Smithers.

## **2.0 PRODUCTS**

Not applicable.

## **3.0 EXECUTION**

Not applicable.

END OF SECTION 01335



**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents. Read, interpret and coordinate it with all other parts.

**1.2 REGULATORY REQUIREMENTS**

- .1 Comply with GC 16 "Compliance with Applicable Laws, and Responsibility for Permits and Licenses" and GC 2.8 & 2.9 "Documents".
- .2 Execute the Work in accordance with applicable by-laws, regulations, and building codes; conform to most recent published revisions, addenda, supplementary and/or appropriate current standards presently recognized and enforced by authorities having jurisdiction.
- .3 Should conflicts arise between one document or authority and another, obtain clarification from the Town of Smithers before proceeding with Work. Generally, the most stringent regulation will govern.
- .4 Submit to the Consultant during construction and upon completion of the Work all permits and certificates of inspection provided by authorities having jurisdiction.

**1.3 AUTHORITY HAVING JURISDICTION**

- .1 Where the term "authority having jurisdiction" is used in the Specifications, the Town of Smithers will designate the party responsible for this role.

**1.4 PERMITS PROVIDED BY TOWN OF SMITHERS**

- .1 The Town of Smithers will provide the Building Permit at no cost to the Contractor.
- .2 Contractor shall abide by the requirements and conditions outlined in the Building Permit
- .3 Contractor shall seek approval from the Town of Smithers for construction permits including but not limited to lockout of existing building systems, coring and saw-cutting, excavation and trenching, hot work and crane/hiab operation, etc. as required to carry out the Work.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01410

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents. Read, interpret and coordinate it with all other parts.

**1.2 REQUIREMENTS**

- .1 Comply with GC 12 "Inspection", GC 13 "Samples and Testing" and GC 14 "Rejected Material and Work".
- .2 The Contractor shall be responsible for Quality Control in accordance with Section 01450 - Quality Control.
- .3 The Town of Smithers, when deemed necessary, will inspect the Contractor's Work by hiring an independent testing agency to achieve quality assurance.

**1.3 INDEPENDENT INSPECTION/TESTING AGENCIES**

- .1 Independent inspection/testing agencies may be engaged by the Town of Smithers when advised by the Consultant for the purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Town of Smithers.
- .2 Notwithstanding the generality of the foregoing, except as noted herein, the Town of Smithers may retain and pay for independent testing, inspections and quality assurance for the following:
  - .1 Soil Strength: The Town of Smithers will retain, at its cost, an independent inspection/testing agency to perform on-site testing for acceptability of soil suitability throughout the course of the Work.
  - .2 Concrete Mix Design: The Contractor will be responsible for the Contractor's concrete mix designs. The Town of Smithers will retain, at its cost, an independent testing agency to review the concrete mix design and perform testing as required for aggregate and gradation, aggregate fracture and air content throughout the course of the Work.
  - .3 Concrete Testing: The Town of Smithers will retain, at its cost, an independent testing agency to perform on-site tests for slump, air content, strength throughout the course of the Work.
  - .4 Structural Steel and Steel Deck: The Contractor shall be responsible for the Quality Control program of testing and inspection of Materials and workmanship throughout the course of the Work. The Town of Smithers will retain, at its cost, an independent inspection/testing agency to perform on-site Quality Assurance inspection of weld quality, painting systems, torque testing and review of the results of the Contractor's quality control program.
  - .5 Fireproofing: The Contractor shall be responsible for the Quality Control program of testing and inspection of Materials and workmanship during the course of the Work. The Town of Smithers will carry out, at its cost, periodic checks of fireproofing quality and review workmanship and Materials.
  - .6 Contractor shall be responsible for any other testing or quality control agencies specified elsewhere in these specifications, including but not necessarily limited to BCRAC roofing inspection program, AWMAC millwork inspection program.

- .7 General: The Town of Smithers and Consultant will review the Contractor's Quality Control programs for completeness, conformance to the Specifications and compliance with applicable codes and standards.
- .3 If any defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of defect. The Contractor shall correct defects and irregularities as advised by the Town of Smithers or Consultant at no additional cost. The Contractor shall pay all costs for re-testing and re-inspection. The Town of Smithers shall have the right to deduct from payment otherwise due to Contractor, the costs of all re-testing and re-inspection.

#### **1.4 CONTRACTOR'S RESPONSIBILITIES**

- .1 Notify appropriate independent inspection/testing agency and Consultant adequately in advance of the requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or Materials required for testing as specifically requested in Specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the Work.
- .3 Arrange for the independent inspection/testing agencies access to the Work, off-site manufacturing and fabrication plants.
- .4 Co-operate to provide reasonable facilities for such access.
- .5 Provide labor and facilities to obtain and handle samples and Materials on Site. Provide sufficient space to store and cure test samples.

#### **1.5 REJECTED WORK**

- .1 Remove defective Work, whether the result of poor workmanship, use of defective products or damage and whether incorporated in the Work or not, which has been rejected by the Town of Smithers or Consultant as failing to conform to the Contract Documents. Replace or re-execute in accordance with the Contract Documents.
- .2 Make good Other Contractor's Work or existing facilities and structures damaged by such removals or replacements promptly.

#### **1.6 REPORTS**

- .1 The Consultant will submit to the Contractor copies of results of any tests undertaken by an independent inspection/testing agency.
- .2 Provide to the Town of Smithers and Consultant copies of any inspection and/or test reports undertaken as part of these Contract Documents, in accordance with Section 01450 - Quality Control.
- .3 Provide copies to Subcontractor of Work being inspected or tested and manufacturer or fabricator of Material being inspected or tested.

#### **2.0 PRODUCTS**

Not applicable.

#### **3.0 EXECUTION**

Not applicable.

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.
- .2 Comply with GC 11 Use of Premises.

**1.2 TEMPORARY UTILITIES**

**.1 Telecommunications**

- .1 The Contractor shall pay for the cost of telephone, e-mail and internet services.
- .2 The Contractor shall pay for the cost of all connections and disconnection and removal of all required communication equipment and services.

**.2 Temporary Power and Lighting**

- .1 The Town of Smithers will permit the Contractor to access temporary power from existing power sources within and adjacent to the terminal building, as approved by the Project Administrator:
- .2 The Town of Smithers shall pay for the cost of power consumption but shall not guarantee an uninterrupted supply of power.
- .3 The Contractor is responsible for the cost of hookup, distribution, maintenance, disconnection and removal of all necessary alterations of the temporary power source from the hook-up point.
- .4 The Contractor shall provide and maintain temporary lighting throughout the Site. The level of illumination on all floors shall be not less than required by WCB regulations.
- .5 Do not, except with written approval from the Town of Smithers, use the Work as a source of light and power for construction purposes. Pay all costs and be responsible for maintenance up to the date of Substantial Performance of the Work, including a proportioned cost of lamp replacement. Upon completion, restore and adjust all plant and equipment used for this purpose. Guarantees and warranties will commence in accordance with the General Conditions to the Contract.
- .6 Use of temporary and permanent electrical system for temporary power is subject to the following:
  - .1 Only 15 ampere duplex receptacles may be used.
  - .2 Receptacles being used for this purpose shall be clearly identified for use as construction power and shall be replaced at completion of the Project.
  - .3 Do not use permanent power for welding or large motor-driven tools.
- .7 The Contractor shall supply its own independent power for its welding machines, compressors, fans, etc.

**.3 Water Service**

- .1 The Town of Smithers will permit the Contractor to access water from existing hydrants or services, as approved by the Project Administrator.:
- .2 The Town of Smithers shall pay for the cost of water consumption but shall not guarantee an uninterrupted water service.
- .3 The Contractor is responsible for the cost of hookup, distribution, maintenance, disconnection and removal of all necessary alterations of the water service from the hook-up point.

**.4 Temporary Ventilation**

- .1 The Contractor shall:
  - .1 Provide adequate forced ventilation of enclosed areas for curing of installed Materials, to disperse humidity and to prevent hazardous accumulations of dust, fumes, vapours or gases.
  - .2 Exercise due care with regard to adequate ventilation when working in confined areas.
  - .3 Prevent hazardous accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
    - .1 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
    - .2 Dispose of exhaust materials in a manner that will not result in harmful exposure to persons.
    - .3 Ventilate storage spaces containing hazardous or volatile materials.
    - .4 Ventilate temporary sanitary facilities.

**.5 Sanitary Facilities**

- .1 Contractor shall provide their own temporary toilet facilities for the duration of the project.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01510

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.
- .2 Comply with GC 11 Use of Premises.

**1.2 FIELD OFFICES**

- .1 The Contractor shall use areas designated by the Town of Smithers for temporary site offices.
- .2 Contractor's site office layout plan is to be submitted to and approved by the Town of Smithers.
- .3 Securing the site offices will be the Contractor's responsibility. Coordinate security procedures with the Town of Smithers who will have access to all areas of the Site at all times.

**.4 Contractor's Office**

The agreed upon building to the north side of the parking lot will be provided as a site office for the Contractor's use, the Contractor is responsible for equipment and services to the building. (PTA-1)

- .1 Maintain office equipped with telephone, fax, internet service and equipment, printer, photocopier and other typical office equipment and supplies required.
- .2 The Town of Smithers's facsimile and photocopier are not available for use by the Contractor.

**.5 Subcontractors' Offices**

- .1 Subcontractors are to provide themselves with offices as necessary, located where directed by the Contractor and in accordance with the approved layout plan.

**.6 First Aid Facilities**

- .1 Provide and maintain first aid facilities on site in accordance with WCB Occupational first aid requirements.

**1.3 EQUIPMENT, TOOL AND MATERIALS STORAGE**

- .1 Provide and maintain in a clean and orderly condition adequate lockable storage boxes for tools and equipment as required.
- .2 Provide and maintain in a clean and orderly condition suitable lockable enclosures or sheds for storage and protection of Materials which require such protection. Limit storage of Materials and equipment to designated storage areas only. When in doubt, ask the Town of Smithers for guidance; height restrictions and other constraints may apply.
- .3 Provide storage area for Town of Smithers Supplied Materials.
- .4 Deliver Materials on a just-in-time basis. The Contractor shall not unduly encumber the

Site with excess Materials. Excess Materials will be removed by the Town of Smithers at the Contractor's expense.

**1.4 STOCKPILES**

- .1 Stockpile materials at location approved by the Town of Smithers.
- .2 The Contractor shall maintain stockpiles in a clean and orderly condition as directed by the Town of Smithers.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01520

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 PARKING AREAS**

- .1 Comply with GC 11 Use of Premises.
- .2 Only vehicles required for construction of the Work will be permitted on site.
- .3 Contractor must make application to the Town of Smithers for parking passes.
- .4 No materials or equipment shall be stored in the designated parking area.
- .5 Vehicles shall at all times maintain a minimum three (3) meter clearance from the Primary Security Line (PSL) fencing.

**1.3 DELIVERIES**

- .6 All deliveries shall be to the Contractors approved project "lay down area"
- .7 Curbside deliveries are only permitted, after hours, or as coordinated with the Project Coordinator.

**1.4 HAUL ROUTES**

- .1 Repair and maintain haul route roads, signs, gates, fencing, traffic lights and electronically operated gates as directed by the Town of Smithers for the duration of the project.
- .2 Provide continuous routine maintenance of haul routes, including grading and debris and dust control.
- .3 All vehicles travelling Airside shall be clean of loose debris, including but not limited to rocks, mud, dirt, etc. Tires and exposed decks shall be brushed and subject to inspection prior to entering the Airside environment.
- .4 Do not overfill trucks in order to avoid spillage. Repeated overfilling or spillage will result in vehicle pass being rescinded. If spillage occurs, clean-up immediately. Contractor to ensure that no native Material is tracked onto any haul roads. If, in the opinion of the Town of Smithers, Material is being tracked onto haul roads the Contractor will be required to cease hauling immediately and remediate the road to pre-existing condition.
- .5 Keep drainage ditches free from haul material during construction.
- .6 Protect all underground structures and utilities.
- .7 Obtain all required permits including municipal permits for use of public roads as haul roads.

**1.5 TEMPORARY ROADS**

- .1 Build, maintain and remove temporary roads as required. Contractor is not permitted to use owner supplied materials to building or maintain temporary roads.
- .2 Protect all underground structures and utilities.



- .3 Repair and maintain temporary road signs, gates, fencing, traffic lights and electronically operated gates as directed by the Town of Smithers for the duration of the project.
- .4 Provide continuous routine maintenance of temporary roads, including grading and dust control.

#### **1.6 TRAFFIC CONTROL**

- .1 The Contractor shall assume complete responsibility for control of pedestrian and vehicular access and traffic during the Work.
- .2 Provide and pay for all necessary control devices unless specified otherwise, including lighting, signs, barricades, qualified flag people, etc. as required by the Town of Smithers for safe completion of the Work.

#### **1.7 REFERENCE STANDARDS**

- .1 Regulate traffic in accordance with Uniform Traffic Control Devices for Canada (UTCD) (distributed by Roads and Transportation Association of Canada), except where specified otherwise.

#### **1.8 PROTECTION OF TRAFFIC**

- .1 Comply with requirements of the Town of Smithers and Consultant.
- .2 When working on a travelled way:
  - .1 Place equipment in position to present minimum of interference and hazard to travelling public.
  - .2 Keep equipment units as close together as working conditions will permit and preferable on the same side of the travelled way.
  - .3 Do not leave equipment on the travelled way overnight.
- .3 Do not close any lanes of road of highway without approval of the Town of Smithers. Before re-routing traffic, erect suitable signs and devices in accordance with instructions contained in Part D of UTCD.

#### **1.9 INFORMATIONAL AND WARNING DEVICES**

- .1 Provide and maintain signs and other devices required to indicate construction activities or other temporary and unusual conditions resulting from the Work that may require road user response.
- .2 Supply and erect signs, delineators, barricades and other warning devices as specified in Part D of UTCD.
- .3 Place signs and other devices in locations recommended in UTCD or as instructed by Town of Smithers.
- .4 Meet with Town of Smithers Project Manager minimum one (1) week prior to commencement of any Work that impacts traffic to review any traffic implications, signs and other devices required for the Work.
- .5 Continually maintain traffic control devices in use by:
  - .1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

- .2 Removing or covering signs which do not apply to conditions existing from day to day.

**1.10 OPERATIONAL REQUIREMENTS**

- .1 Part of the Work is in the restricted area and will require escort services by qualified permanent Restricted Area Identification Card (RAIC) holders.
- .2 Refer to Section 01140 - Work Restrictions Terminal, Section 01141 - Work Restrictions Airside and Section 01565 - Security.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01550

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.
- .2 Comply with GC 11 Use of Premises.

**1.2 SITE SAFETY AND SECURITY**

- .1 Comply with GC 9 Safety and Security and the Construction Safety/Security Manual.
- .2 Erect and maintain whatever enclosures, barricades or temporary doorways that are required. Employ such forces, including security personnel, as are necessary to prevent theft from and vandalism to the Work.
- .3 The Town of Smithers shall at all times have access through and be given keys for locks to such secure areas.
- .4 The Contractor shall provide security as required during normal working hours and shall control access to and from the Site. Material shall not be removed from the Site unless accompanied by a Removal Authorization form signed by both the Town of Smithers and Contractor's representative. The Contractor shall provide security during non-working hours as it deems necessary to protect equipment, Materials and completed Work.

**1.3 FIRE PROTECTION**

- .1 Refer to GC 9 Safety and Security and the Construction Safety/Security Manual.
- .2 Provide fire protection facilities as required by local authorities, the National Building Code and WCB and Construction Safety/Security Manual.

**1.4 EXISTING SERVICE**

- .1 Where the Work necessitates the interruption of services to existing building, the Contractor shall schedule it to occur outside of operational hours only and obtain written permission from the Town of Smithers a minimum of seventy-two (72) hours in advance.

**1.5 BARRIERS, SITE ENCLOSURES (HOARDING)**

- .1 Provide and maintain perimeter hoardings to the Work area in locations as indicated on the drawings, as necessary to carry out the Work and in locations required to meet operational requirements of the Town of Smithers.
- .2 Provide hoarding layout and erection drawings (including sequencing as required), to the Town of Smithers for review and approval prior to erecting on Site.
- .3 The Contractor may need to make minor alterations to the hoarding to facilitate the construction. Obtain Town of Smithers approval for changes to the perimeter hoarding and coordinate changes with Other Contractors.
- .4 All hoarding walls, except as noted otherwise in the Drawings, shall be construct full height from existing floor to underside structure above, or as close to full height as practical where encountering extensive existing services.
- .5 Construct hoardings using 38 mm x 89 mm construction grade lumber framing @ 600

- mm O.C. Erect hoardings square, true, butt-joined and flush.
- .6 Where exposed to public view, finish with primer plus two (2) coats of latex paint or tightly applied white poly. Allow for three (3) different paint colours as selected by the Consultant.
  - .7 Hoardings exposed to exterior elements shall be designed, constructed and maintained to prevent any infiltration of rain at all times. Normal building temperature and humidity must be maintained within the existing terminal.
  - .8 Any hoarding that separates the restricted area from the public area shall be framed with plywood from floor to ceiling soffit. Building hoarding tight to the soffit of the floor above. Proper separation of security screened passengers is of utmost importance.
  - .9 Install insulation full height where insulation is indicated in the drawings. Cut and trim insulation neatly to fit all spaces. Butt joints tightly, offset vertical joints. Do not compress insulation. Insulation shall be full width of stud spaces.
  - .10 Place poly after all insulation has been installed and before application of plywood. Cover entire areas noted, no voids. Work to adhesive manufacturer's recommendations. Install under slight tension, lap all edges at least 150 mm and seal. Set true to plane, free of defects, tears and sags.
  - .11 Provide lockable pedestrian door(s) as required for operation of each phase and conforming to applicable security restrictions, refer to Construction Safety/Security Manual. Provide three (3) sets of keys to the Town of Smithers.
  - .12 Hoarding shall be dust tight to localize dust generating activities. These barriers shall be fully sealed with poly sheeting and duct tape to ensure no dust escape into occupied or public spaces. Abut hoarding framework to existing building structures including beams, walls and columns. Stuff openings between the wood framing members and the building structure with glass fiber material and seal along free edges with tape, prior to application of plywood. Ensure a dust seal is maintained around existing services.
  - .13 All hoarded areas are to be maintained at negative pressure. Negative air ducts must be concealed and/or contained in the existing ceilings and/or hung from the ceiling in a temporary enclosure that is painted to be aesthetically pleasing to the public.  
  
Provide an air movement system which extracts air directly from work area, filters extracted air through a high efficiency particulate aerosol filtering system, (capable of collecting and retaining fibres greater than 0.3 microns in length at 99.97% efficiency) and discharges this air directly outside Work area to the exterior of building. This system shall maintain a minimum pressure differential of 5 Pa relative to adjacent areas outside of Work area. A gauge must be installed by the contractor so the pressure differential can be monitored.
  - .14 Maintain and protect poly barriers. Provide necessary plywood protection of poly barriers in heavy work areas to ensure dust seal is maintained within work enclosures. Provide necessary manpower to ensure the dust barriers are maintained. Provide necessary protection (such as concrete curbs) around dust barriers/hoardings in baggage handling area to ensure baggage carts do not penetrate them.
  - .15 Existing communication equipment areas must be sealed and provided with positive pressure and conditioned air in order to prevent any damage.
  - .16 Remove all hoarding at the completion of each phase of the project. Make good all

finishes damaged by the hoarding.

## **1.6 DUST BARRIERS**

- .1 Provide temporary dust barriers as required to carry out the Work and in locations required to meet operational requirements of the Town of Smithers. Cover entire areas noted with no voids. Extend from floor to underside of slab above. Seal at top, bottom and perimeter edges.
- .2 Provide dust seals through operational inbound and outbound conveyor lines and related floor penetrations.
- .3 Work to adhesive manufacturers recommendations. Install under slight tension, lap all edges at least 150mm and seal. Set true to plane, free of defects, tears and sags.
- .4 Where equipment such as electrical boxes, wiring, ductwork, piping or registers are installed in walls and need to penetrate the dust barrier, the barrier shall be wrapped behind such equipment and overlapped by at least 100mm, and taped. Any penetrations of this wrapping, such as for wires, pipes or ducts, shall be effectively sealed with caulking, tape or other accepted material.
- .5 All dust barrier areas are to be maintained at negative pressure. Negative air ducts must be concealed and/or contained in the existing ceilings and/or are hung from the ceiling in a temporary enclosure that is painted to be aesthetically pleasing to the public.

Provide an air movement system which extracts air directly from work area, filters extracted air through a high efficiency particulate aerosol filtering system, (capable of collecting and retaining fibres greater than 0.3 microns in length at 99.97% efficiency) and discharges this air directly outside Work area to the exterior of building. This system shall maintain a minimum pressure differential of 5 Pa relative to adjacent areas outside of Work area. A gauge must be installed by the contractor so the pressure differential can be monitored.

- .6 Contractor must maintain and protect all poly barriers in the Work areas. Provide necessary plywood protection of poly barriers in heavy work areas to ensure dust seal is maintained within work enclosures. Provide necessary manpower to ensure the dust barriers are maintained. Provide necessary protection (such as concrete curbs) around dust barriers/hoardings in baggage handling area to ensure baggage carts do not penetrate them.
- .7 Provide dust seals through operational inbound and outbound baggage conveyor lines and through any penetrations.
- .8 Remove dust barriers at the completion of each phase of the project. Make good all finishes damaged by the dust barriers.

## **1.7 SITE FENCING**

- .1 Supply, install and maintain temporary site fencing as required. Relocate, dismantle and remove fencing from time to time as required to carry out the Work or as required by the Town of Smithers.
- .2 Failure to do so will result in the Town of Smithers arranging for Other Contractors to do this Work and the cost of such shall be borne by the Contractor.

- .3 Dismantle and remove all fencing at the completion of each phase of the project. Make good all finishes damaged by the fencing.
- .4 Construction, soil debris and FOD that migrates outside the fenced construction area must be immediately removed and the affected area cleaned. Failure to do so will result in backcharges from the Town of Smithers. (ADD 2)
- .5 Where construction debris, dust, soil and other objects (FOD) could blow or otherwise migrate onto airside and aircraft areas outside the construction zone, place filter fabric onto fencing as SECTION - 01 74 00 CLEANING Paragraph; 3.1.9 (ADD 2)
- .6 Temporary fencing that separates the construction area from airside operations shall comply with SECTION - 01 56 50 SECURITY Paragraph; 1.11 (ADD 2)

#### **1.8 TEMPORARY HANDRAILS**

- .1 Supply and install temporary guards as required. Dismantle and remove guards on completion or as required for safety.
- .2 Failure to do so will result in the Town of Smithers arranging for Other Contractors to do this Work and the cost of such shall be borne by the Contractor.
- .3 Provide and maintain safety barricades, covered openings and guards throughout the Work and enforce this requirement. Include dismantling and re-installation as required from time to time as required to carry out the Work.

#### **1.9 PROJECT SIGNS AND INFORMATION NOTICES**

- .1 The Town of Smithers may supply a project identification signboard for the Contractor to erect in a prominent location on the Site.
- .2 Only Town of Smithers supplied project identification signboards and Contractor notices for safety are permitted on Site. All signs to be approved by Town of Smithers.
- .3 Maintain signs and notices for the duration of the project. Remove and dispose of Contractor supplied signs on completion of the project unless otherwise instructed by Town of Smithers.
- .4 Provide adequate temporary signage to ensure passengers are temporarily re-routed during each phase of construction. All signs to be approved by Town of Smithers.

#### **1.10 PROJECT MARKERS**

- .1 Provide temporary markers around the designated work zone as indicated on the drawings and as directed by the Town of Smithers. Use acceptable materials as approved by the Town of Smithers.
- .2 Remove and re-install markers as required throughout construction.

#### **1.11 PROTECTION OF WORK**

- .1 Protect surrounding private and public property from construction debris, operations and

damages at all times during performance of the Work.

- .2 Be responsible for damage incurred and pay costs to correct damage caused by own forces.
- .3 Provide protection for completed and partially completed finishes and equipment during the performance of Work.
- .4 Be responsible for damage incurred due to lack of or improper protection.

#### **1.12 SCAFFOLDING AND LADDERS**

- .1 Design, construct and dismantle ladders, scaffolding in accordance with CSA S269.2-M87 and WorkSafe BC regulations governing scaffolding and ladders.
- .2 Erect scaffolding independent of walls and erect ladders so as not to damage finishes. Remove promptly when no longer required. Wear fall protection as required by WorkSafe BC when working on scaffolding.
- .3 Platform scaffolding over and/or above public areas shall be finished with plywood and painted. Install a layer of 6 mil ploy over full area of top of platform and fix tightly to adjacent wall, glazing or hoarding to provide seal over gap. Turn up 300mm; caulk and seal.
- .4 Scaffolding erection drawings shall be sealed by a Professional Engineer registered in the Province of British Columbia.
- .5 All platform-scaffolded areas shall be maintained at negative pressure. Negative air ducts must be concealed and/or contained in the existing ceilings and/or are hung from the ceiling in a temporary enclosure that is painted to be aesthetically pleasing to the public.

Provide an Air Movement system which extracts air directly from work area, filters extracted air through a High Efficiency Particulate Aerosol filtering system, (capable of collecting and retaining fibres greater than 0.3 microns in length at 99.97% efficiency) and discharges this air directly outside work area to exterior of building. This system shall maintain a minimum pressure differential of 5Pa relative to adjacent areas outside of work area. A gauge must be installed by the contractor so the pressure differential can be monitored.

- .6 All platform-scaffolded areas shall not block security and/or life safety systems, including but not limited to security cameras, sprinklers, fire alarm detection devices and fire alarm speakers. The contractor shall relocate all such devices as necessary.

#### **1.13 RESTORATION OF TEMPORARY FACILITIES**

- .1 Restore permanent facilities used for temporary services to specified condition.
- .2 Remove all temporary construction services, utilities on completion of the Work.

#### **2.0 PRODUCTS**

Not applicable.

#### **3.0 EXECUTION**

Not applicable.

END OF SECTION 01560



**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 RESTRICTED AREA**

- .1 Comply with GC 9 Safety and Security and the Construction Safety/Security Manual.
- .2 An area at the aerodrome (Airport) identified by a sign to which access is restricted to authorized persons only is considered a restricted area (commonly referred to as Airside). Restricted areas are further defined as sterile or non-sterile:
  - .1 Sterile area is the restricted area accessible to screened passengers; including but not limited to passenger hold rooms and aircraft loading bridges
  - .2 Non-sterile area is the restricted area non-accessible to screened passengers; including but not limited to baggage make-up areas, aprons and aircraft movement areas.
- .3 In general, access into the restricted area of the Smithers Airport is limited to select access points as approved by the Town of Smithers. All personnel and vehicles entering or leaving the construction site must follow prescribed access routes and be under escort.
- .4 Security measures shall be taken to meet the Town of Smithers's security requirements.
- .5 Town of Smithers Security, Operations and/or the RCMP may, for security reasons, remove all of the Contractor's work force from the Airport at any time. No assessment for temporary "Stop-Work" periods will be payable.

**1.3 CONTRACTOR'S RESPONSIBILITIES**

- .1 Contractor and subcontractors shall be responsible for construction, personnel and vehicles employed for the Project and requiring access to restricted areas.

**1.4 PASSES AND KEYS**

- .1 Passes are mandatory in restricted areas for all personnel and equipment engaged in the Work. Persons with passes are subject to the Town of Smithers's Conditions of Issue. Refer to Appendix A for Conditions of Issue.
- .2 The Contractor may apply for permanent passes, called a Restricted Area Identification Card (RAIC), temporary escort-required passes and/or vehicle plates, as required to carry out the Work. Pass type will be dependent on the duration of the Work. Applications for passes can be obtained from the Town of Smithers Access Control Office, located on Level 1 of the Domestic Terminal Building (Phone: 604-276-6177). A payment of \$25.00 is required to obtain temporary passes and vehicle plates, \$20.00 of which is a refundable deposit.
- .3 The Contractor is responsible for obtaining and safekeeping of all RAIC's, temporary passes and vehicle plates required to carry out the Work.
- .4 Valid driver's license or other picture identification is required in conjunction with a temporary pass to access the restricted area.

- .5 A register of all temporary passes currently in use will be maintained by a security escort. This register will include the identity of the user and may include other information such as driver's license number and/or times of entry and exit.
- .6 On completion of the project, RAIC's and temporary passes are required to be returned to the Town of Smithers Access Control Office. Non-refundable fees and/or penalties will be charged to the passholder and their sponsor company for any passes that are not returned to the Town of Smithers. A schedule of these fees and/or penalties is available from the Access Control Office.
- .7 Upon request, keys accessing certain areas can be issued to the Contractor. Keys will be issued to permanent passholders only and are not transferrable. Non-refundable fees and/or penalties may be charged to the passholder and their sponsor company for any keys that are not returned to the Town of Smithers.
- .8 All fees and/or penalties are subject to change with limited notice. The most current fees and/or penalties shall apply.

### 1.5 SECURITY ESCORT SERVICES

- .1 For Work inside the restricted area, the Contractor shall coordinate and pay for security escort, equipped with two-way radio, to provide safe access within restricted areas. The Airside security escort will provide the following services:
  - .1 Register temporary passes for the Contractor's listed daily workforce and delivery people.
  - .2 Maintain a registration list of temporary pass holders for inspection by Town of Smithers or similar representative.
  - .3 Deny restricted area admission to anyone without an approved temporary or permanent pass or not employed by the Contractor.
  - .4 Provide information and caution as necessary to alert the temporary passholder entrant of the requirements to remain within designated boundaries.
  - .5 Provide surveillance of the construction area to ensure temporary passholders remain within construction areas.
  - .6 Advise the Town of Smithers of any breach or attempt of breach of security and safety regulations. The Contractor is to note that a breach of security and/or safety regulations by a temporary or permanent passholder will result in removal of the passholder from the restricted area.

- 1.6 Security escorts must be qualified under the Airport restricted area access clearance program.

### 1.7 RESTRICTED AREA ACCESS

- .1 The Contractor, all staff and subcontractors working or accessing the restricted area will be required to attend a safety and security orientation meeting. The meeting will be held at the Town of Smithers offices prior to commencement of construction. The Town of Smithers shall make no payment for attendance at such a meeting. Contractor employees or subtrades new to the Site will be required to undergo a similar orientation throughout the course of the Work.
- .2 RAIC holders will be subject to security controls, per the Conditions of Issue, including

the requirement to be inspected prior to entering the restricted area.

- .3 Temporary passholders will be subject to security controls, per the Conditions of Issue, including the requirement to be inspected prior to entry and to be escorted while inside the restricted area.
- .4 At no time will a temporary passholder have access to aircraft, baggage, cargo, or passengers unless under security escort.
- .5 At no time will a vehicle have access to the restricted area unless under security escort.
- .6 Temporary passholders will be escorted by a person in possession of a Restricted Area Identity Card (RAIC) that has been issued to them for movements inside the restricted area. The escort to temporary passholder ratio shall not exceed 1:3 vehicles and/or 1:10 persons in non-sterile areas and/or 1:3 persons in sterile areas. Temporary pass holders must remain in complete care, control and line-of-site of the escort person at all times while inside the restricted area. **It should be understood that the number of escorts required is not strictly related to the number of workers on site, but is usually determined by the activities occurring at any given time. It should also be understood that security regulations are subject to change with limited notice.**

#### 1.8 RESPONSIBLE PERSONNEL

- .1 Provide the Town of Smithers with a list of responsible personnel and those of subcontractors, who may be contacted after working hours in case of emergency.

#### 1.9 DELIVERIES

- .1 Provide personnel at access control point to issue and receive passes, for deliveries to restricted areas.
- .2 Any delivery vehicle required to encroach on aircraft movement/maneuvering areas not closed to aircraft traffic, must be escorted through operational areas to the construction areas by a security escort.

#### 1.10 DAILY SECURITY

- .1 Contractor shall provide work schedule minimum seven (7) days in advance so restricted area work activities can be coordinated with Town of Smithers Operations and Security.
- .2 When work is to be done within the restricted area outside normal working hours, submit for approval area and times of work, if there is any deviation from the approved work schedule.
- .3 Contractor shall follow the Town of Smithers's instructions to maintain Airport security during all phases of construction. Any work required to restore Airport security will be carried out at the Contractor's expense.

#### 1.11 SECURITY FENCE

- .1 For work to be done on the restricted airside portion of the project; contractor shall create a new Primary Security Line (PSL). Install 2.4 m high temporary security fencing, with triple barbed wire strands, exactly to match existing adjacent airport security fencing. Access into the fenced area shall be by gated access from a groundside location, and there shall be no access possible from the construction area onto the restricted airside. In this manner, the restricted area rules listed above will not be applicable for work done within the fenced area. Remove the temporary PSL fencing at end of project.

- .2 Install the revised temporary Primary Security Line (PSL) fence in coordination with the Town of Smithers. Notify Town of Smithers of any defects, breaks, or breaches.
- .3 Stationary equipment and vehicles will not be permitted within three (3) meters of the non-restricted side of the fence and within one (1) meter of the restricted side of the fence.
- .4 The security fence may be temporarily relocated as required to facilitate construction. Advise the Town of Smithers and Consultant at least fourteen (14) days in advance of any necessary fence relocations.
- .5 Upon inspection, make good any damage to security fence as required by the Town of Smithers.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01565

**APPENDIX A**

**“Conditions of Issue”**

## Conditions of Issue

The term privilege and phrase pass, access assignment and (or) permission both refer to privileges granted and administered by the Town of Smithers, including but not limited to that of Signing Authority; document of entitlement; security pass including Restricted Area Identification Card (RAIC), temporary clearance-pending pass, temporary Block, Access or Visitor pass; cut key; electronic key card; lock combination; parking pass; Airside Vehicle Operating Permit (AVOP) or vehicle plate; Terminal Vehicle Operating Permit (TVOP); qualification or certification; and identification or qualification card.

### General Conditions

- COI-1 I hereby expressly consent to the collection, use and disclosure by the Aerodrome Operator (Town of Smithers ADD 2) of personal information, including but not limited to biometrics and prox records, to government agencies and other third parties the Aerodrome Operator determines appropriate in the circumstances, all in accordance with applicable privacy laws and these Conditions of Issue.
- COI-2 I acknowledge that the RAIC or other pass, access assignment and (or) permission privilege issued to me must be used in a manner that is compliant with the Canadian Aviation Security Regulations, a copy of which is available through the Transport Canada website at [www.tc.gc.ca](http://www.tc.gc.ca) or by hard copy from the Town of Smithers Access Control Office.
- COI-3 I am subject to any service charges and penalty fees, as set out in the Privileges Program Fee Schedule, associated with the issuance and recovery of any RAIC or other pass, access assignment and (or) permission privilege issued to me and that these fees are subject to change at the discretion of the Town of Smithers.
- COI-4 I understand that the RAIC or other pass, access assignment and (or) permission privilege issued to me by the Town of Smithers, and all information contained therein, is the property of the Town of Smithers. I will present the RAIC or other document of entitlement for inspection or surrender immediately upon demand by the Aerodrome Operator (Vancouver Town of Smithers) (including those appointed or authorized by the Aerodrome Operator), or my employer.
- COI-5 I will return the RAIC or other pass, access assignment and (or) permission privilege issued to me to the Access Control office immediately upon any change in the circumstances under which it was issued, including but not limited to termination of employment, change of duties, completion of temporary work activities, a change in restricted area access requirements, an absence from work for a period exceeding 60 days, or on or before the date of card expiry.
- COI-6 I understand that when I use my RAIC or other pass, access assignment and (or) permission privilege to open an access point such as a door, hatch or gate, including baggage systems, I assume control of the access point and all responsibility for ensuring against unauthorized access through that point. I only relinquish this responsibility after ensuring the access point is left locked and properly secured.
- COI-7 I will not knowingly or willingly assist an unauthorized person(s) to access the Restricted Areas of the Aerodrome.
- COI-8 I will not use the RAIC or other pass, access assignment and (or) permission privilege issued to me to bypass passenger screening, where as an intended passenger on a commercial aircraft, or where required by airport procedure and/or legislation, I would be subject to such screening.
- COI-9 I understand the RAIC or other pass, access assignment and (or) permission privilege issued to me is only valid while I am on duty or in the performance of work-related duties. I will not use my RAIC or other pass, access assignment and (or) permission privilege to access Restricted Areas for personal reasons. The Aerodrome Operator (Town of Smithers), its representatives, the Minister, or a peace officer reserve the right to confirm my duties within the Restricted Area.

- COI-10 I will not use the RAIC or other pass, access assignment and (or) permission privilege to perform work or duties that are not directly related to the business of the company providing sponsorship of my privileges.
- COI-11 I will acknowledge and follow the instructions relating to security issues given to me by the Aerodrome Operator (Vancouver Town of Smithers), its representatives, the Minister, a CATSA screening officer, or a peace officer.
- COI-12 I will ensure the RAIC or other documents of entitlement issued to me, including a clearance-pending pass, block pass, access pass or visitor pass is visibly displayed on my outer clothing at all times while I am in the Restricted Area.
- COI-13 It is my responsibility to safeguard the RAIC or other pass, access assignment and (or) permission privilege issued to me and I will report a lost or stolen pass, access assignment and (or) permission privilege, together with a police file number (for stolen only), to my sponsor company and the Town of Smithers Access Control office immediately.
- COI-14 I understand a "sterile restricted area" is a portion of a greater restricted area that is intended to be accessed by screened passengers, such as hold rooms, aircraft loading bridges, arrivals corridors and walkways; whereas a "non-sterile restricted area" is a portion of a greater restricted area that is not intended to be accessed by screened passengers, including but not limited to all airside areas, restaurant kitchens and service counters, or any area under construction.
- COI-15 I understand the maximum security escort ratio inside a sterile restricted area is one (1) security escort person in possession of a RAIC issued to them for every three (3) escort-required pass holders (see COI-14 above for definition of sterile restricted area)
- COI-16 I understand the maximum security escort ratio inside a non-sterile restricted area is one (1) security escort person in possession of a RAIC issued to them for every ten (10) escort-required pass holders (see COI-14 above for definition of non-sterile restricted area)
- COI-17 When I am appointed as a security escort, I will remain with the person under escort while in a Restricted Area, as required by the Canadian Aviation Security Regulations. This includes the requirement to maintain control and direct line-of-sight with the person under escort and any tools of the trade in their possession.
- COI-18 I will comply with all rules and regulations as laid down in accordance with the Restricted Area Access Control Directive, Airside Traffic Directives and Airport Operations Directives as relevant to my employment and work activities within the Restricted Area. Any questions I have relating to these or other Directives, Policies or Regulations may be directed to appropriate Aerodrome Operator staff.

I acknowledge that I have read, understood and agree to comply with the Conditions of Issue and that my failure to do so may result in the suspension or revocation of the privileges so granted.

Signature \_\_\_\_\_

Name \_\_\_\_\_

Pass # \_\_\_\_\_

Company \_\_\_\_\_

Title \_\_\_\_\_

Office Use Only

Initial

Date

Date \_\_\_\_\_

Conditions of Issue





## **1.0 GENERAL**

### **1.1 DOCUMENTS**

This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts

- Wherever SECTION 01 62 00 – SUBSTITUTIONS is referenced in any specification section,  
.1 replace with SECTION 01 60 00 Paragraph 1.5 SUBSTITUTION. ADD 2

### **1.1 BASIC PRODUCT REQUIREMENTS**

- .1 Comply with GC 20 Performance of the Work and Personnel, GC 21 Materials and GC 22 Manufacturer's Directions.
- .2 Use new Material unless otherwise specified.
- .3 Submit the following information for Materials and equipment proposed for supply:
  - .1 Name and address of manufacturer.
  - .2 Trade name, model and catalogue number.
  - .3 Performance, descriptive and test data.
  - .4 Manufacturer's installation or application instructions.
  - .5 Evidence of arrangements to procure.
- .4 Use products of one manufacturer for Materials and equipment of same type or classification, unless otherwise specified.

### **1.2 MANUFACTURER'S INSTRUCTIONS**

- .1 Unless otherwise specified, comply with manufacturer's most recent printed instructions for Materials and installation methods.
- .2 Notify Consultant in writing of any conflict between the Specifications and manufacturer's instructions. Consultant will designate which document is to be followed.

### **1.3 ACCEPTABILITY**

- .1 Consultant may elect to perform inspections and tests at the place of manufacture, the shipping point, or at the destination, to verify conformance of Materials to applicable Specifications. Inspections and tests performed by Consultant will not relieve Contractor of its responsibility to meet the Specifications, nor shall such inspection/tests be considered to be a guarantee of acceptance of Materials that will be delivered at a later time.
- .2 Nonconforming Materials, whether in place or not, will be rejected by Consultant with written notification to Contractor to correct or remove the defective Materials from the Project. If Contractor fails to respond, Airport Authority may order correction, removal, or replacement of defective Materials by others, at Contractor's expense.
- .3 Materials accepted on the basis of samples provided may be sampled and inspected/tested by Consultant at any time. The fact that the Materials were accepted on the basis of samples will not relieve Contractor of its responsibility to use Materials which

conform to the Specifications.

#### **1.4 SUBSTITUTION**

- .1 No substitutions will be permitted without prior written approval of Airport Authority.
- .2 Proposals for substitution made after award of contract must include technical information and statements of respective costs of items originally specified and the proposed substitution.
- .3 Proposals for substitution made after award of contract will be considered by Airport Authority if:
  - .1 Materials specified are not available,
  - .2 Delivery of those Materials specified would unduly delay completion of contract, or
  - .3 Alternate Materials to those specified, which are brought to the attention of and considered by Airport Authority as equivalent to the material specified and will result in a credit to the Contract Price.
- .4 Should proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other Work on the Project. Pay for design or Drawing changes required as a result of substitution.
- .5 Amounts of all credits arising from acceptance of substitutions will be determined by Consultant and Contract price will be reduced accordingly

#### **1.5 FASTENINGS - GENERAL**

- .1 Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non-corrosive fasteners, anchors and spacers for securing exterior work.
- .2 Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage. Wood and plastic plugs are not acceptable.
- .3 Conceal fasteners where indicated. Space evenly and lay out neatly.
- .4 Fastenings which cause spalling or cracking are not acceptable.

#### **1.6 DELIVERY AND STORAGE**

- .1 Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.
- .2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.
- .3 Store material and equipment in accordance with supplier's instructions.
- .4 Touch-up damaged factory-finished surfaces to Airport Authority's satisfaction. Use primer or enamel to match original. Do not paint over name plates.

#### **2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01600

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 SECTION INCLUDES**

- .1 This section of the Specification includes requirements applying to all trades for execution of the Work within the existing building.
- .2 Comply with GC 9 Safety and Security, GC 15 Overtime, Hours of Work, GC 36 Cutting, Fitting, Patching.

**1.3 SITE EXAMINATION**

- .1 Information provided relating to existing conditions is not guaranteed. It is deemed that the Contractor has verified and evaluated all information relative to existing conditions. Contract includes all Work that can be determined by visual examination.
- .2 The detailed examination of existing conditions augments the information provided by the Contract Documents.
- .3 Contractor is responsible for additional costs associated with the existing site conditions.

**1.4 SITE CONDITIONS**

- .1 Maintain unobstructed safe access for personnel and Materials at all times.
- .2 Maintain safe public access to the occupied building at all times. Conduct all activities in a manner that respects the continuing operation activities of the Town of Smithers and presence of the public during the performance of the Work. Perform the Work so as to minimize inconvenience to the normal operations of the facility.
- .3 The drawings may diagrammatically show some known utilities including abandoned and relocated utilities in their approximate locations. These locations are not guaranteed nor is their existence confirmed. Verify location of underground services.
- .4 Equipment, fixtures and outlets indicated or specified shall be considered to be approximate.

**1.5 SETTING OUT OF WORK**

- .1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated. Provide one benchmark, one working point and one set of intersecting coordinates for trades' use.
- .2 Provide devices needed to lay out and construct work.
- .3 Supply such devices as straight edges and templates required to facilitate inspection of work.

**1.6 EXISTING CONDITIONS**

- .1 If while carrying out alteration Work, the Contractor or subcontractors expose conditions that contravene with applicable regulatory codes and requirements of authorities having jurisdiction, unsafe or in any way less than the acceptable industry standard for the particular item, the Contractor shall immediately notify the Consultant before proceeding

with further Work. The Consultant will review the condition and issue the appropriate instruction.

- .2 All Work performed and Materials used shall be not less than the standard of quality for the existing finished building, except where such existing materials are no longer available, are inappropriate for the intended reconstruction or detailed otherwise on the Drawings.

## **1.7 EXISTING SERVICES**

- .1 The Contractor shall familiarize itself with all available information and documents regarding existing building services and ensure that they are protected and maintained continuously throughout the entire period of construction and alterations.
- .2 Any interruptions to existing electrical power, water, fire protection system and other services shall be kept to an absolute minimum and the Work performed to have the least impact on Airport operations.
- .3 Submit schedule and obtain approval from Town of Smithers for any shut-down or closure of active service or facility at least five (5) working days prior to shut-down. Follow lockout procedures as outlined in the Construction Safety/Security Manual. Adhere to approved schedule and provide notice to all affected parties prior to commencing the Work.
- .4 Before commencing the Work, establish location and extent of service lines in area of Work and notify Town of Smithers of findings. Contractor must X-ray all floor slabs to locate existing service lines prior to any demolition, coring, sawcutting, etc. Contractor must use wandng or detection devices or hand dig pits to locate all underground services.
- .5 Where unknown services are encountered, immediately advise Town of Smithers and confirm findings in writing.
- .6 Remove abandoned service lines as indicated on Drawings. Cap or otherwise seal lines above ceilings and/or below floor slabs, or as otherwise directed by Town of Smithers. All abandoned services shall be removed to source unless otherwise directed. Services permitted to be left shall be clearly tagged noting service type and source.
- .7 Relocate existing service and utility lines in area of work which must remain active.
- .8 Survey and record locations and elevations for underground services of maintained, re-routed and abandoned service lines.

## **1.8 PROTECTION**

- .1 Refer to Section 01560 - Temporary Barriers and Enclosures.
- .2 The Contractor shall take all necessary precautions to fully protect those portions of the existing building, against damage during demolition and/or installation of new Work. Maintain and relocate protection until such Work is complete.
- .3 The Contractor shall provide protection against smoke propagation emanating from welding operations by use of temporary smoke barriers and/or temporary local ventilation of areas involved.
- .4 All Work areas to receive renovations shall be completely sealed off by the Contractor from the remainder of the building. Temporary partitions shall be installed, covered, insulated and sealed from construction noise and dust. All debris shall be removed daily

from these areas to maintain clean, safe and efficient Site conditions. Control of dust is critical, take all necessary precautions and schedule Work to ensure dust is kept to a minimum.

- .5 Prevent hazardous accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction by providing air tight enclosures. Provide local negative air to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas. Dispose of exhaust materials in a manner that will not result in harmful exposure to persons. Ventilate storage spaces containing hazardous or volatile materials. Ventilate temporary sanitary facilities. Provide negative air system complete with high efficiency filters.
- .6 Take precautions to ensure existing ducts are kept completely dust free at all times.
- .7 Provide and maintain weather protection to protect freshly placed concrete.
- .8 Where Material or equipment is being transported within the existing building on carts or pallets, such carts or pallets shall have rubber tires.
- .9 Damage of any nature to existing building or its contents, except where required by the Work, shall be made good to the satisfaction of the Town of Smithers and/or Consultant and at no additional cost to the Town of Smithers. Making good shall mean restoration to at least original condition in terms of strength, safety, workmanship and appearance.
- .10 Ensure that each trade protects its own Work from damage arising out of construction operations of other trades. Ensure that each trade, on completion, removes protective coverings and restores all fittings, fixtures and components to produce the intended appearance and quality.

#### **1.9 FIRE-RATED ASSEMBLIES**

- .1 The Contractor and all Subcontractors shall conform to the following requirements to maintain the continuity of fire-rated assemblies whether or not shown on the Drawings:
  - .1 Openings for conduits, pipes and ducts shall be tightly fitted or sealed with firestop Materials at the penetration to prevent the passage of flame and remain in place when subjected to the standard fire exposure in CAN4-S115 for a period of time equal to the fire protection rating required for the grade of fire-rated assembly in which the penetration occurs.
  - .2 The Contractor shall be responsible for ensuring that where the Work passes through a fire-rated assembly, the penetration shall be constructed using an Underwriter's Laboratory labeled assembly approved by authorities having jurisdiction. Install in strict accordance with the manufacturer's directions. A sample of this Material shall be submitted to the Consultant for review. Refer to Specifications.

#### **1.10 BURNING AND WELDING**

- .1 Obtain Town of Smithers permission and directions on procedures and precautions to be taken prior to performing any welding or any operation which may involve source of ignition, which could cause fire or explosion.
- .2 No burning or open flame is allowed within the construction area, except with an approved hot work permit. All work areas must have smoke detectors replaced with heat detectors temporarily connected in order to provide the necessary fire safety.
- .3 Maintain at all times adequate fire-extinguishing and suppression equipment, in good

condition, at immediate site of such operations.

- .4 Submission of Town of Smithers approved Hot Work Permits will be required for all cutting, torching and welding. These permits are to be submitted at least 72 hours prior to commencing the work.

#### **1.11 ALTERATIONS, CUTTING AND PROTECTION**

- .1 Comply with permit and lockout requirements of the Construction Safety/Security Manual.
- .2 Cutting and removal Work shall be performed so as not to cut or remove more than is necessary and so as not to damage adjacent Work.
- .3 Before openings are cut in existing floor slabs and holes are core drilled in existing concrete, undertake proper radiographic (X-RAY) inspections of affected area for existing services. Obtain written approval from the Town of Smithers prior to proceeding.
- .4 New openings in existing concrete shall be saw-cut. The cuts shall not overrun the corners of the openings. Core-drill at each corner of new rectangular opening so that the concrete can be removed without saw-cut corners.
- .5 Continuously/continually provide water misting in heavy construction areas (i.e. jackhammering) to keep dust propagation to a minimum. Provide necessary manpower to ensure this is performed at all times.
- .6 Contractor shall assign the Work of moving, removal, cutting, patching and repair to trades under his supervision so as to cause the least damage to each type of Work encountered, and so as to return the building as much as possible to the appearance of new Work.
- .7 Protect remaining finishes, equipment and adjacent Work from damage caused by cutting, moving, removal and patching operations. Protect surfaces which will remain a part of the finished Work and touch-up as required.
- .8 The Contractor shall coordinate with the mechanical and electrical trades so that all their items, such as electrical switches, lights, pull stations, outlets, etc., are not installed prior to review of their location by the Consultant. These items when located on a column, post, etc., shall be centred on such surface and all efforts made to conceal conduit and the like regardless of what the electrical drawings show. When two such items or fixtures are adjoining or nearby, they must be centred and mounted at the same height, or mounted one directly above the other, regardless of the mounting heights shown on the electrical or mechanical drawings and specifications. Review exposed surface wiring or conduit runs for location by the Consultant prior to placement. Runs must be straight, parallel to wall, with tight 90° bends.

#### **1.12 PATCHING, EXTENDING AND MATCHING**

- .1 Patch and extend existing work using skilled mechanics that are capable of matching the existing quality of workmanship. The quality of patched or extended Work shall not be less than that specified for new Work.
- .2 Patch, extend or match existing work as necessary to make the Work complete and consistent, to identical standards of quality and visual appearance.
- .3 In areas where a portion of an existing finished surface is damaged, lifted, stained, or otherwise made or found to be imperfect, patch or replace the imperfect portion of the surface with matching Material.



- .4 Do not incorporate salvaged or used Material in new construction, except where small quantities of finish Material which are difficult to match or duplicate are approved for patching or extending purposes by the Consultant.
- .5 Provide adequate support or substrate for patching of finishes.
- .6 If the imperfect surface was painted or coated, repaint or recoat the patched portion in such a way that uniform colour and texture over the entire surface results.
- .7 If the surrounding surface cannot be matched, repaint or recoat the entire surface.
- .8 The quality of the products that exist in the building shall serve as the specification requirement for strength, appearance and other characteristics.
- .9 Where new Work abuts or finishes flush with existing work, make the transition as smooth and workmanlike as possible. Patched Work shall match existing adjacent Work in texture and appearance so as to make the patch or transition invisible to the eye at a distance of 1.0 m.
- .10 Where drywall, wood, metal or other finished surface is cut in such a way that a smooth transition with new Work is not possible, terminate the existing surface in a neat fashion along a straight line at a natural line of division and provide trim appropriate to the finished surface.
- .11 Where two (2) or more spaces are indicated to become one (1) space, rework floors and ceilings so that horizontal planes are without breaks, steps or bulkheads.
- .12 In cases of a change of level 50 mm or more, obtain instructions from the Consultant as to method of making transition.
- .13 Restore existing work that is damaged during construction to a condition equal to its condition at the time of the start of Work.
- .14 At locations in existing areas where partitions are removed, patch the floors, walls and ceilings with finish Materials to match adjacent finishes.
- .15 Where a product or type of construction occurs in the existing building, and it is not specified as a part of the new Work, provide such products or types of construction as needed to patch, extend or match the existing Work.
- .16 These Specifications will generally not describe existing products or standards of execution, nor will they enumerate products which are not a part of the new construction. The existing product is its own specification.
- .17 In the sections of the Specifications which follow these general requirements, no concerted attempt has been made to describe each of the various existing products that must be used to patch, match, extend or replace existing work. Obtain all such products in time to complete the Work on schedule. Such products shall be provided in quality which is in no way inferior to the existing products.

#### **1.13 CONCEALMENT**

- .1 Conceal pipes, ducts and wiring in, wall and ceiling construction of finished areas, unless noted otherwise.

#### **1.14 REPAIR**

- .1 Replace Work damaged in the course of alterations, except at areas approved by the

Consultant for repair.

- .2 If the repaired Work is not brought up to standard for new Work, the Consultant will direct that it be cut out and replaced with new Work.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01730

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 COORDINATION**

- .1 The Contractor is responsible for coordination of all aspects of the Work including those of Subcontractors and Other Contractors.
- .2 The Contractor is deemed by Town of Smithers to be the principal Contractor for the Work, responsible for the health and safety of all workers, subcontractors and their workers, other contractors and their workers, and authorized site visitors.
- .3 All project-related correspondence to Town of Smithers is to be addressed or copied to the Town of Smithers Project Manager. Authorizations must be in writing. Email transmission of the prescribed forms of documents is acceptable.

**1.3 GENERAL PROTECTION**

- .1 Comply with GC 10 Environmental and Archaeological Protection.
- .2 Prior to the commencement of construction, a meeting may be held to discuss the environmental protection measures. This meeting will include representatives from Town of Smithers and the Contractor.
- .3 Environmental management plans shall be developed by the Contractor in a form and with content acceptable to Town of Smithers. The plans required shall be determined by the Town of Smithers on a project basis and may include, but are not limited to, Spill Prevention and Response, Erosion-Sediment Control (ESC), and Waste and Recycling Management. Environmental management plans must be submitted prior to the start of Work.
- .4 The Contractor shall conduct all operations in a careful manner to protect natural ground surfaces, water quality, vegetation, fish and wildlife and shall use practices which will:
  - .1 Prevent and avoid all forms of pollution to waterbodies, groundwater, soil and air.
  - .2 Minimize soil erosion and preserve ground stability.
  - .3 Minimize disturbance by restricting construction activities to the designated construction right-of-way as approved by Town of Smithers as well as extra temporary Work space required along the perimeter of the Work area.
  - .4 Not destroy, remove or clear trees, timber or shrubs or disturb watercourses to any extent greater than is absolutely necessary for the performance of the Work.
- .5 The Contractor shall dispose of sewage, refuse and chemical wastes (including hazardous wastes) in a manner approved by all authorities having jurisdiction.
- .6 Compliance - The Contractor shall comply with all directions given by Town of Smithers to protect and preserve the environment.
- .7 Town of Smithers will conduct monitoring of the Work Site in order to ensure that the Contractor's practices conform to the environmental requirements set out herein.

- .8 The Contractor shall allow free and complete access to the Work by personnel charged with the monitoring of the environmental practices of the Contractor.
- .9 If Town of Smithers inspection during construction to monitor compliance with this Environmental Protection Specification disclose any non-compliance by the Contractor with the requirements of either this Environmental Protection Specification or any other provision of the Contract, the Contractor shall, at the direction of Town of Smithers's Representative or inspectors, immediately suspend without compensation all construction activities in connection with the part of the Work which is non-compliant, immediately rectify or correct the non-compliance and then deliver to Town of Smithers's representative such information as Town of Smithers's representative may require to demonstrate to Town of Smithers's satisfaction that there will be no repeat incident of such non-compliance. Work shall not recommence on the part of the Work until after Town of Smithers's Representative has confirmed to the Contractor in writing that Town of Smithers's Representative is satisfied that the Contractor has in place safe-guards to avoid such incidents in future.

#### 1.4 AIR QUALITY AND ENERGY CONSERVATION

- .1 Burning of refuse or other material is prohibited.
- .2 The Contractor shall control fugitive dust and other airborne emissions from such site activities as, but not limited to, vehicular and machinery movement, demolition of existing structures, earthworks and stockpiling of soils or other construction materials. The use and application of chemical dust suppressants by the Contractor shall be approved by the Town of Smithers.
- .3 The Contractor shall have in place appropriate indoor air quality control measures to ensure that construction and public areas are not adversely affected by fugitive dust, uncomfortable temperatures, and other unacceptable air emissions.
- .4 The Contractor will be required to collect information for reporting to Environment Canada's National Pollutant Release Inventory (NPRI). This includes submission to the Town of Smithers of a completed NPRI Project Paint and Solvent Use Form and a NPRI Construction Road Dust Form, as applicable, upon project completion. A copy of submission details including Material Safety Data Sheets (MSDS), calculations, input values, and rationale to determine threshold values must be provided. .5 The Contractor will be required to meet the *Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations* if applying traffic marking products.
- .6 Prior to commencing construction and operation of any facilities with point-source emissions (such as exhaust vents, chimneys, and stacks), the Contractor shall obtain, and retain for inspection if requested by the Town of Smithers, all necessary regulatory permits.
- .9 A person must not operate a non-road diesel engine if the discharge of air contaminants exceeds 20% opacity, measured after the first three minutes of the start-up of that engine.
- .10 A person may not idle a non-road diesel engine for more than five consecutive minutes unless the idling is necessary to serve the purpose of the machine, emergency purposes, to ensure the safe operation of the machine, or for maintenance purposes. Vehicles should make use of idle-reduction technologies where applicable and appropriate.
- .11 Endeavour to use low-emission construction equipment where applicable – including use of vehicles using alternative fuels or with emission control devices.

- .12 Ensure that all equipment being used and disposed of that containing refrigerants complies with the Federal Halocarbon Regulations and Ozone Depleting Substance Regulations.
- .13 Ensure that construction activities are energy efficient by minimizing the use of lighting and electronics and use energy efficient lighting where required.
- .14 Ensure that all building openings are properly insulated to prevent building heat loss.
- .15 Electricity, water, and gas consumption must be metered during construction to provide to the Town of Smithers the amount of resources used.

## **1.5 ARCHAEOLOGICAL PROTECTION**

- .1 All archaeological resources are protected, whether found on the ground surface or buried beneath the surface.
- .2 All work shall be undertaken in compliance with the Town of Smithers Archaeological Resource Protection Standard.
- .3 Areas where historical remains are suspected or identified will be monitored by the Town of Smithers's archaeological representative during Construction. If any geological, historical or archaeological remains are discovered during the Work, the Contractor shall cease all related activity and notify Town of Smithers. All such remains shall be deemed the property of Town of Smithers and the Contractor shall protect them from vandalism and theft.
- .4 Where a previously unidentified archaeological or heritage Site is encountered during construction, no further Work will be undertaken in the immediate vicinity of the Site, until it is examined by Town of Smithers's archaeological representative.

## **1.6 WATER QUALITY PROTECTION**

- .1 All water discharges from the construction site and related work areas (including access roads, soil fill areas) shall comply with the Town of Smithers Surface Water Quality Guidelines. To this end the Contractor shall:
  - .1 Develop sediment control plan and submit to Town of Smithers for review. Adjust plan as required by Town of Smithers. Plan must ensure sediment laden water does not enter ditches, culverts or storm sewers, and will include sediment ponds and silt fences, as required. Size of sediment ponds will be restricted to avoid attracting water fowl to Site. Plan must include monitoring of discharge water quality. Monitoring results shall be provided promptly to the Town of Smithers.
  - .2 Ensure all water discharging into waterways and drainage systems meets the criteria of GC 10 Environmental and Archeological Protection.
  - .3 Complete work in zones to keep the exposed area of active earthwork to a minimum. The previous zone shall be completed prior to commencement of the following zone.
  - .4 In periods of significant precipitation, that has potential to cause severe runoff, in consultation with the AEC and Town of Smithers, temporarily suspend Work when directed. Work shall recommence when Contractor, AEC and Town of

Smithers see fit.

- .5 During periods when the Work is suspended due to significant precipitation Contractor shall monitor the Site for silt laden runoff and, where required, implement mitigative measures, at Contractor's own cost, to control silt laden runoff.
- .6 Minimize the removal of and impact to all riparian vegetation.
- .7 Take reasonable care to avoid damage to graded and/or seeded areas.
- .8 Not cause unnecessary damage, or increase the possibility of erosion, through the use of vehicles or equipment.
- .9 Ensure that where water is to be discharged on land, the water will be dissipated over a well-vegetated area, temporary riprap or other stable surface material to ensure that there is no soil erosion and will not be allowed to flow directly back into Fraser River/Sturgeon Banks or its tributaries.
- .10 Restore, to the equivalent of its original condition, all soil or ground which has been graded or disturbed as a result of contamination, or eroded or become unstable as a result of his activities.
- .11 Not operate construction equipment in waterways.
- .12 Not use waterway beds to obtain construction Materials.
- .13 Not dump excavated fill, waste material or debris in waterways unless previously discussed with the AEC and Town of Smithers and specifically indicated on the Drawings.
- .14 Design and construct temporary crossings to minimize erosion and disturbance to waterways/ditches. All temporary crossings and Materials must be removed immediately after use of the temporary crossing.
- .15 Ensure that working hydrocarbon spill containment systems are available on Site and that personnel are well trained in their use.
- .16 Not fuel or maintain construction equipment adjacent to waterways/ditches.
- .17 Not store fuels, oils, lubricants, greases, solvents or like petroleum substances adjacent to waterways/ditches.
- .18 Not allow material (i.e. plastics, paper, construction Materials, etc.) to enter any waterbody; the policy shall be "zero emissions" into the aquatic environment.
- .19 Ensure that pumps used for removing water is placed on bermed polyethylene sheeting to prevent hydraulic fluid and/or fuel leaks from entering the environment.
- .20 Ensure that all machinery on Site and all transient vehicles, including haul trucks, are free of leaks of any kind or are removed from use in the Work and banned from Site until the problem is rectified to the satisfaction of the Town of Smithers.
- .21 The Contractor shall service or refuel vehicles and equipment in such a way that contaminants do not enter any waterbody.
- .22 All vehicles utilized for refueling will be equipped with automatic shut-off valves.

- ..24 Do not wash-out concrete trucks, pumps or wash any tools in adjacent watercourses or drainage ditches.
- .25 Remove and dispose of excess concrete or grout and wash water at an appropriate treatment facility (i.e. wash back into truck for disposal at concrete batch plant).

## **1.7 WASTE AND RECYCLING MANAGEMENT**

- .1 The Contractor shall comply with all applicable laws, regulations, permit conditions and requirements of the Contract when disposing of any waste generated on this project, including but not limited to normal garbage and trash, hazardous wastes (such as used paint or waste batteries), waste oil, or other Materials not authorized for on Site disposal. At no time shall any waste Material be allowed to enter Fraser River/Sturgeon Banks or its tributaries. No on-site burning or burial of waste shall be acceptable.
- .2 The Contractor shall be responsible for assuring that all reasonable efforts are implemented to eliminate or minimize waste production. Additionally, only facilities approved by the authorities having jurisdiction and by Town of Smithers may be used for disposal or recycling of any waste (garbage, trash, hazardous, etc.)
- .3 For off-site waste and hazardous waste disposal, transportation and disposal are to comply with all applicable federal, provincial, regional laws and bylaws including but not limited to the Environmental Management Act, Hazardous Waste Regulation, Landfill bylaw.
- .4 All non-hazardous and non-toxic trash, such as paper, paper products, wood, plastic, glass, and discarded food items, shall be stored in closed, leak-proof type storage bins. The Contractor is responsible for proper collection and transportation to disposal facilities (e.g., sanitary landfill) approved by the authorities having jurisdiction and by Town of Smithers. The Contractor shall establish a Waste and Recycling Management Plan which will provide clear documentation of the implementation of the plan at commencement, throughout progress of the Work and at completion.

### **WASTE AND RECYCLING MANAGEMENT PLAN**

- .1 Prior to the start of construction, the Contractor shall provide a full and complete Waste and Recycling Management Plan for review and approval by the Town of Smithers.
- .2 The Waste and Recycling Management Plan shall contain the following:
  - .1 Analysis of the proposed job site waste to be generated, including types of waste and recyclable materials by volume or weight.
  - .2 A list of items to be salvaged.
  - .3 Disposal and recycling sites.
  - .4 The appropriate separation, handling and recycling to be used by all parties at the appropriate stages of the Work.
  - .5 Reporting schedule.
- .3 Implementation and Materials Handling Procedures
  - .1 The Contractor shall designate an on-site party or parties to be

- responsible for instructing site personnel and overseeing and documenting procedures and results of the Waste and Recycling Management Plan.
- .2 The Contractor shall distribute copies of the Waste and Recycling Management Plan to the Town of Smithers Project Manager, the Site Superintendent, each Subcontractor and the Consultant.
  - .3 The Contractor shall provide on-site instruction for the appropriate separation, handling and recycling to be used by all parties at the appropriate stages of the Work.
  - .4 The Contractor shall designate lay-down areas within the Work area to facilitate separation of materials for recycling and salvage. Recycling and waste bin areas are to be kept neat and clean and clearly marked to avoid contamination of materials.
  - .5 The Contractor shall prevent contamination of materials to be recycled and salvaged and handle materials consistent with requirements for acceptance by designated facilities.
  - .6 The contractor shall provide separation of waste Materials for re-use and/or recycling.
- .4 Transportation.
- .1 The Contractor may engage a hauling subcontractor, self-haul or make each subcontractor responsible for their own waste transportation. In all cases compliance with these requirements is mandatory.
- .5 Reporting
- .1 Submit to the Town of Smithers before Total Performance of the Work, or as requested by the Town of Smithers, a completed Waste and Recycling Project Form (attached to the end of this section of the Specifications) including copies of way-bills, invoices, manifests and other documentation confirming that all waste materials have been hauled to the required locations and legally disposed of.

#### HAZARDOUS WASTE

- .1 It is the Contractor's responsibility to determine whether any waste generated pursuant to the execution of the Work is classified as a hazardous waste ("Hazardous Waste") by any authority having jurisdiction, has any hazardous or toxic characteristics, or is identified as a "Hazardous Waste" under the Environmental Management Act.
- .2 All Hazardous Waste shall be treated or disposed of in authorized facilities, permitted under regulations as defined by Ministry of Environment. . The Contractor shall identify potential facilities for waste disposal and evaluate each such facility's legitimacy, compliance with regulatory requirements and capacity. Contractor shall notify Town of Smithers in writing of approved waste disposal Site(s) for Town of Smithers's approval. After selecting a facility, Contractor shall periodically check and verify that the facility is properly handling and disposing of the Hazardous Waste.
- .3 All temporary or permanent hazardous materials storage tanks (e.g. diesel fuel, gasoline) must be registered by the Contractor with the Town of Smithers prior to being brought to site. A completed Town of Smithers Storage Tank Registration Form (included at end of



specifications) must be provided to the Town of Smithers for review and approval.

## **1.8 ENVIRONMENTAL SPILL PREVENTION AND RESPONSE PROCEDURES**

- .1 Spills to the environment have the potential for causing:
  - .1 Environmental damage.
  - .2 Adverse effects on fish, wildlife or other environmental resources.
  - .3 Heightened publicity associated with a positive or negative effect on the environment.
  - .4 Legal action with respect to environmental noncompliance and/or damage.
- .2 The Contractor shall employ the following measures to prevent Spills (e.g. leaks, releases, discharges): maintain spill containment/clean-up equipment and Materials, develop a site specific Spill Prevention and Response Plan, and educate employees on the environmental requirements and responsibilities.
  - .1 **SPILL PREVENTION AND RESPONSE PLAN**
    - .1 Prior to the start of construction the Contractor shall provide a full and complete Spill Prevention and Response Plan for review and approval by the Town of Smithers.
    - .2 The Spill Prevention and Response Plan shall contain the following:
      - .1 Analysis of the activities and equipment associated with the Work that pose the main spill risks.
      - .2 A list of preventative measures to be taken to reduce the risk of spills occurring.
      - .3 A list of response steps to be taken in the event of a spill.
      - .4 A call-out list including the Town of Smithers and appropriate regulatory agencies.
      - .5 Reporting procedures.
- .3 The following Spill response procedures shall be undertaken by the Contractor and shall be coordinated with Town of Smithers's response through the Town of Smithers's representative:
  - .1 Take immediate action to minimize environmental consequences and manage resolution of the incident.
  - .2 Notify the Town of Smithers immediately; all spills regardless of size are to be reported immediately to Airport Operations at 604-207-7022.
  - .3
  - .4 Gather information for the assessment of causes so that prevention of future incidents can be planned.
  - .5 Prepare a written Environmental Incident Report (EIR) as soon as possible (within one (1) working day of the occurrence) summarizing events, actions and recommendations for future avoidance.
  - .6 Submit EIR to Town of Smithers representative.

- .7 Prepare updates to the EIR as necessary and submit them to Town of Smithers's representative.

**1.9 FILL QUALITY**

- .1 All fill material brought onto or off of Town of Smithers lands must comply with the Town of Smithers Fill Quality and Fill Placement Standard.
- .2 Any vehicle loads containing contaminants will be rejected and the vehicle permanently banned from the Site.
- .3 Clean fill, soil, concrete and asphalt excavated from the construction areas can be placed on an approved "on-airport" site as directed by the owner. (PTA-1)

**1.10 WILDLIFE**

- .1 For the protection of wildlife and wildlife habitat, the Contractor shall:
  - .1 Minimize disturbance to wildlife,

**1.11 NOISE**

- .1 The Contractor shall comply with municipal noise by-laws and shall adhere to any specific dB requirements. All equipment must be equipped with mufflers or other noise abatement devices, in good working order, and suitable for use in the areas of the proposed Works. Where regulated, hours of Work must comply with all applicable regulations.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01735

(FORM follows)

## Waste and Recycling Project Form Construction & Demolition

project \_\_\_\_\_

Please use this form to track all waste including:

- Regular construction waste such as concrete, metals, and drywall
- Hazardous waste such as fuels, paint, and solvents.

Submit this form at the end of the project or on a regular basis as arranged with the Town of Smithers's Environment Department. Include any associated certificates of disposal.

<b>Project Name</b>	<b>Project Site/ Location</b>	<b>Project Type</b> <input type="checkbox"/> <b>Construction</b> <input type="checkbox"/> <b>Demolition</b>
<b>Name of Company</b>	<b>Contact Person</b>	<b>Telephone No.</b>

<b>Project Update</b>			
<b>For Period:</b> _____ <b>to</b> _____			
<b>Type of Material</b>	<b>Disposal Facility</b>	<b>Weight Salvaged or Recycled (kg)</b>	<b>Weight Disposed (kg)</b>

**The Town of Smithers is committed to operating the Airport in a manner that minimizes its impact on the surrounding environment, both natural and urban.**

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 REQUIREMENTS**

- .1 Comply with GC 11 Use of Premises and GC 23 Clean-up.
- .2 Conduct cleaning and disposal operations to comply with local ordinances and regulations.
- .3 Store removed waste in specified containers, and remove from premises at the end of each working day in legal manner.
- .4 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

**2.0 PRODUCTS**

**2.1 MATERIALS**

- .1 Use only cleaning materials, chemical agents and equipment recommended by the applicable manufacturers of that surface and that meet the requirements of rules, regulations and practices required by applicable legislation. Ensure that they are compatible with cleaning materials and methods that will be used by the Town of Smithers following completion of the Work.

**3.0 EXECUTION**

**3.1 CLEANING DURING CONSTRUCTION**

- .1 Maintain the Work daily in a tidy condition, free from accumulation of waste products and debris. The Contractor shall be responsible for the cleanliness of the Site. Enforce and ensure Other Contractors and Subcontractors carry out cleaning as required. The Contractor shall cleanup and back-charge the appropriate party for clean-up costs.
- .2 Ensure dust, debris and other contaminants resulting from the Work will not contaminate building systems.
- .3 Provide waste containers for collection of garbage and debris. Empty containers on a daily basis. Provide covers for containers.
- .4 Remove waste material and debris from the Site and deposit in waste container at the end of each working day. Empty waste containers daily and/or as directed by the Town of Smithers.
- .5 Ensure that gypsum board and other construction debris capable of being reused and/or recycled is handled and disposed of off Site to a legal designated site capable of handling such material.
- .6 Remove surplus Materials and Temporary Works, debris, rubbish, tools, equipment and machinery not required for performance of remaining Work.
- .7 Clean interior areas prior to start of finish Work, maintain areas free of dust and other contaminants during finishing operations.

- .8 Failure to perform regular and satisfactory cleanup will result in the Town of Smithers arranging for clean-up and back-charge the Contractor.
- .9 Ensure area outside of the Site is free of Foreign Object Debris (FOD) at all times. Install filter cloth along fencing as required to contain construction related FOD to the Site. At end of each work day, clean Site free of debris.
- .10 The operational public areas adjacent to the perimeter of the construction site hoarding inside the terminal will be inspected by Town of Smithers safety and operations staff regularly including every morning at 05:00 a.m. Any damaged hoarding dust or debris shall be repaired or cleaned up by Town of Smithers immediately and any costs incurred shall be charged to the Contractor's account.
- .11 The Contractor may elect to employ the Town of Smithers janitorial cleaning company, to provide all daily cleaning and final cleaning in order to maintain Town of Smithers standards.

### **3.2 FINAL CLEANING AND PREPARATION FOR OCCUPANCY**

- .1 Perform final cleaning in preparation for acceptance of the Work for "occupancy" (place into service), Substantial Performance of the Work, Total Performance of the Work, or as directed by the Town of Smithers.
- .2 Refer to Specifications for additional cleaning requirements.
- .3 Submit a program for cleaning to the Consultant and Town of Smithers for review.
- .4 Refer to each Specification section for specific cleaning requirements.
- .5 Upon completion of the Work, remove Construction Plant, surplus Materials and Temporary Works including but not limited to construction offices, storage sheds, fencing, hoardings, temporary protection, temporary utilities, lighting and signs from the Site. Contractor shall notify and seek written approval from the Town of Smithers to remove any Materials or equipment belonging to or supplied by the Town of Smithers.
- .6 Initially clean of paint spots, stains, droppings, rubbish, debris, tools and equipment and thoroughly broom/vacuum clean throughout before final washing and/or waxing where specified.
- .7 Examine, repair and adjust hardware operation to door units, window units, millwork/casework units, washroom partitions, equipment units, etc., leaving all in clean, polished, smooth, perfect, functional working order.
- .8 Examine, clean and polish accessories, fittings and fixtures to produce intended appearance and use.
- .9 Wash down and dry floors, stairs, decks and glazed wall surfaces and/or faces; re-polish as necessary.
- .10 Brush off construction dust and wipe down with a damp cloth throughout, generally on and over sills, structural steel, tracks, ledges, shelves, high ceilings, counters, cabinets, railings, etc. Clean concrete from steel members.
- .11 Clean and polish glass, glazing, mirrors, chrome units free of dirt, paint spots, stains, droppings, packing tapes, protective films, grout, etc., to produce intended appearance.
- .12 Clean dirt, dust, paint spots, droppings, etc., from plumbing and electrical fittings and other Material and equipment throughout the building and leave in first-class order.

- .13 Clean roof areas free of construction debris, especially nails, screws and sharp objects that can damage the roofing membrane. Ensure roof drains are clear of debris and dome fittings are secure. Ensure that floor drains are clear of construction debris.
- .14 Replace glass broken and scratched during performance and until completion of the Work, occurring from any cause, at no additional cost.
- .15 The Contractor shall provide clean-up of all areas outside of the tenant spaces when directed by the Town of Smithers. This may be back-charged to the tenant if they do not clean up their own Materials.
- .16 In preparation for inspection for "occupancy", Substantial Performance of the Work and Total Performance of the Work, do cleaning to meet the following conditions:
  - .1 Clean structural steel including touch-up if necessary.
  - .2 Resilient floors: wash, seal, wax and polish where required and/or specified.
  - .3 Carpeting: trim, clean, vacuum and as applicable replace worn or damaged areas.
  - .4 Other floors: remove visible stains, marks, paint spots, droppings, leaving floors thoroughly scrubbed, washed, sealed, waxed and polished where required or specified.
  - .5 Finish hardware: adjust, clean, polish and confirm in perfect working order.
  - .6 Aluminum, stainless steel and other miscellaneous metals: wash exterior and interior sides, clean and polish; replace any damaged finishes.
  - .7 Glass: wash exterior and interior sides, clean and polish.
  - .8 Doors: adjust, clean, touch-up and confirm in perfect working order.
  - .9 Painted, decorated and stained work: soil and dirt marks, fingerprints, stains; remove and patch, replace and/or touch-up where required.
  - .10 Ceramic tiles: clean, wash, seal, replace flawed and damaged tiles where required.
  - .11 Suspended acoustical ceilings: replace damaged, broken and stained tiles; replace broken and bent suspension members.
  - .12 Damaged finishes, including glass, stainless steel, acoustic ceilings, ceramic tiles, carpet, millwork, etc.: replace.
  - .13 Built-in lighting fixtures and equipment: clean, touch-up and re-lamp where required.
  - .14 Work under mechanical division: clean, balance, test, certify and make operational; identify and label where required and/or specified; remove and replace construction filters.
  - .15 Work under electrical division: clean, test, certify and make operational; identify and label where required and/or specified.
  - .16 Unfinished/shell areas (such as storage areas, service/utility rooms and tenant improvement spaces): wipe all surfaces, broom and vacuum clean unless otherwise specified and/or scheduled.

- .17 Site, exterior: leave the Work site thoroughly neat and clean and free of all construction rubbish and debris.
- .18 Paved surfaces: broom and hose clean; remove staining from equipment fluids.
- .19 Other ground surfaces, including landscaping: clean, rake, smooth neatly throughout.
- .17 The Work shall be kept in a clean condition pending Substantial Performance of the Work and a cleanup performed within seven (7) days of the date of Substantial Performance of the Work and final cleaning before official opening.

END OF SECTION 01740

**1.0 GENERAL**

**1.1 DOCUMENTS**

- .1 This section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

**1.2 RELATED SECTIONS**

- .1 Section 01810 – Commissioning.

**1.3 DEMONSTRATION REQUIREMENTS**

- .1 Prior to final inspection, demonstrate operation, adjustment and maintenance of architectural, mechanical and electrical equipment and systems to the Town of Smithers and Consultant. Arrange and pay for start-up personnel where applicable. Advise and obtain approval from the Town of Smithers of demonstration dates.
- .2 One (1) systems and equipment demonstration to the Town of Smithers will be required. Separate sessions can be held for architectural, mechanical and electrical systems.
- .3 The commissioning coordinator shall organize the demonstration to the Town of Smithers and Consultant of all equipment and systems in conjunction with the Contractor and Subcontractor's commissioning agent(s). Equipment suppliers shall participate in the demonstration as required. The demonstrations will occur only after the operation and testing has been successfully completed.
- .4 A team comprising of the following will be required at the demonstration:
  - .1 Commissioning coordinator.
  - .2 Contractor and Subcontractors' commissioning representative(s).
  - .3 Consultant and Consulting Engineers (as applicable).
  - .4 Town of Smithers operating and maintenance representatives (as applicable).
  - .5 Town of Smithers Independent Professional (as applicable).
  - .6 Subcontractors, including representation from applicable trades.
- .5 The commissioning coordinator shall submit the names of representatives of the demonstration team for the Consultant and Town of Smithers's review at an early stage of the commissioning phase of the Project.
- .6 The Contractor its Subcontractors shall:
  - .1 Co-operate with the Town of Smithers and commissioning coordinator in the demonstration of all systems and equipment.
  - .2 Provide necessary representation from the Contractor and Subcontractors as necessary to carry out the demonstration of systems and equipment as required. The cooperation of all trades is essential for an efficient and planned process; representatives in attendance must be intimately familiar with the performance and commissioning of all systems and equipment.
- .7 The commissioning coordinator shall:
  - .1 Coordinate and attend the orientation and demonstration session for the Town of



Smithers's operating and maintenance personnel.

- .2 Submit agenda for demonstration session for approval of the Town of Smithers.
- .3 Provide records of demonstrations to the Town of Smithers, including a sign in sheet of all representatives present.
- .4 Maintain a log of questions, problems encountered and solutions employed discussed during the demonstration. Submit this log to the Town of Smithers.

**1.4 TRAINING REQUIREMENTS**

Not applicable.

**2.0 PRODUCTS**

Not applicable.

**3.0 EXECUTION**

Not applicable.

END OF SECTION 01820

## **PART 1 - General**

### **1.1 SECTION INCLUDES**

- .1 Building Demolition.
- .2 Removal of designated building equipment and fixtures.
- .3 Removal of designated construction.
- .4 Storage of removed materials and disposal of materials.
- .5 Identification of utilities.
- .6 Refer to items scheduled at end of section.

### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 73 50 – Environmental Protection.
- .3 Section 01 74 20 – Hazardous Waste Removal.

### **1.3 REFERENCES, CODES & STANDARDS**

- .1 BCBC British Columbia Building Code: Part 8 Safety Measures at Construction and Demolition Sites.
- .2 Worker's Compensation Board (WCB) of British Columbia Regulations
- .3 CSA Canadian Standards Association: CSA S350

### **1.4 REGULATORY REQUIREMENTS**

- .1 Conform to applicable code for demolition work, dust control, products requiring electrical disconnection.
- .2 Do not close or obstruct egress width to any building or site exit.
- .3 Do not disable or disrupt building fire or life safety systems without three (3) days prior written notice to Owner.
- .4 Conform to applicable regulatory procedures when discovering hazardous or contaminated materials. Contractor shall be responsible for retaining a Hazardous Materials Consultant to investigate the existing conditions, test sample materials, determine hazardous contents, and specify procedures and measures to be undertaken during construction.

### **1.5 PROJECT CONDITIONS**

- .1 Accept the site as it exists and be responsible for all demolition work as shown on the drawings and as specified herein.
- .2 Maintain safe access for the staff and public to the existing building at all times. Conduct all activities in a manner that respects the continuing operation activities of the Airport, its staff and presence of the public during the Work.

- .3 Maintain public safety and traffic control precautions at all times during the demolition work, using properly trained qualified persons to control all Demolition Contractors' activities, vehicles, equipment, traffic and presence of public during the Work.
- .4 Provide and maintain necessary perimeter protection including hoarding, guard railing, screen cover, lights and warning signs during execution of the work to fully protect all persons.
- .5 Maintain unobstructed safe access for personnel and removal of materials at all times.
- .6 Take precautions to guard against movement, settlements, collapse and damage to adjacent structures, services, utilities, sidewalks, paving, curbs, landscaping and construction designated to remain.
- .7 Prevent debris from accumulating and blocking surface drainage systems and blocking safe exit passage to adjoining streets and property.
- .8 Do not allow dirt, debris or discarded materials to accumulate on site. Remove promptly.
- .9 Keep fire extinguishing suppression equipment on hand at all times.

## **1.6 QUALITY ASSURANCE**

- .1 Assign Work to trades experienced, efficient and skilled in the Work designated to remain or to be removed so as to cause the least damage to each type of Work encountered.

## **PART 2 - Products**

### **2.1 MATERIALS**

- .1 Except for materials and equipment to be removed and relocated, materials designated to be removed shall become the Contractor's property and shall be removed entirely from the site and disposed of in a legal manner to an approved disposal site as applicable.

## **PART 3 - Execution**

### **3.1 PREPARATION**

- .1 Carefully remove existing materials and equipment to be relocated in the new Work.
- .2 Provide all bracing, shoring, underpinning or needling as needed to maintain building and its components structurally secure and free of deflection or stress until permanent support completed.
- .3 Provide protection to ensure materials, finishes and surfaces to remain will not be damaged, scratched or marred by Work of this section.
- .4 Take all reasonable measures to ensure that dust and dirt generated by the Work are fully localized and contained within the demolition area by properly sealing off all openings, louvers, vents, ducts, ceiling spaces and any other similar potential passageways leading to existing building systems and existing occupied areas still in operation.

### **3.2 DEMOLITION**

- .1 Cutting, removing and demolition shall be performed so as not to cut or not or remove more than is necessary or to damage adjacent Work. Cut existing construction back to neat straight lies allowing for replacement finishes to follow.
- .2 Schedule and execute all work in a careful manner with all necessary consideration to prevent injury or damages to persons and to surrounding property. Do not interfere with the use of and passage to and from

adjoining buildings, driveways, sidewalks and other facilities.

- .3 Take all reasonable measures to ensure that dust and dirt generated by the Work are fully localized and contained within the demolition area by properly sealing off all openings, louvers, vents, ceiling spaces and any other similar potential passageways leading to existing building systems and existing occupied areas still in operation.
- .4 Store such items being reused in a protected area until ready to be installed into the new construction proposed.
- .5 Cut and remove assemblies, materials, items indicated as removed on the drawings.
- .6 Repair and make good damage to existing construction caused by the work of this section. Use mechanics skilled in the type of Work involved to replace such damaged Work.
- .7 Prevent debris from blocking any existing surface drainage catch basins or systems.

### **3.3 CLEANING**

- .1 Continuously during the work of this section remove all dirt, debris discarded material and deposit in waste containers. Keep routes to and from waste containers clear.
- .2 Clean interior area of building daily where work of this section causes or deposits any dirt or debris.

### **END OF SECTION**

## 1 **ASBESTOS GENERAL**

Work this specification section with the Hazardous Materials Survey included in these Specification documents

### Section Includes

- .1 The disturbance, handling, removal, and disposal of asbestos-containing materials from the specified areas of Smithers Airport located at 6421 Airport Road No. 1, Smithers,, BC. It is the intent of this Scope of Work to show the work necessary to complete the asbestos abatement.
  - Black putty on 1988 date stamped windows, if scheduled to be disturbed during the renovations, must be removed using **Moderate Risk** asbestos work procedures,
  - Green vinyl floor tile and adhesive mastic in Breaker Room B, if scheduled to be disturbed during the renovations, must be removed using **Moderate Risk** asbestos work procedures,
  - Pipe thread compound on all piping throughout the building, if scheduled to be disturbed during the renovations, must be removed using **Moderate Risk** asbestos work procedures, if using the “wrap and cut” removal method,
  - Firestop in Basement Electrical Room, if scheduled to be disturbed during the renovations), must be removed using **Moderate Risk** asbestos work procedures, if using the glove-bag removal method
  - Pipe elbow insulation in the Basement Mechanical/Boiler Room, Breaker Room B, and in the crawlspace, if disturbed during the renovations, must be removed using **Moderate Risk** asbestos work procedures, if using the glove-bag removal method
  - Brown caulking on the door to tarmac from the Air Canada office, if scheduled to be disturbed during the renovations, must be removed using **Moderate Risk** asbestos work procedures,
  - Yellow vinyl floor tile and adhesive mastic in the S4G Admin Office and into the Hallway, if scheduled to be disturbed during the renovations, must be removed using **Moderate Risk** asbestos work procedures,
  - Yellow vinyl floor tile and adhesive mastic on the 2<sup>nd</sup> Floor Landing, if scheduled to be disturbed during the renovations, must be removed using **Moderate Risk** asbestos work procedures,
  - Green vinyl floor tile and adhesive mastic at the top of the Stairwell, if scheduled to be disturbed during the renovations, must be removed using **Moderate Risk** asbestos work procedures,
- .2 The disturbance, handling, removal and disposal of asbestos-containing materials must be performed in strict compliance with these specifications and with all applicable regulatory requirements.

### 1.2 Documentation

- .1 The Hazardous Materials Removal Contractor will maintain the following documentation on site.
  - .1 A copy of the WorkSafeBC Occupational Health & Safety Regulation (current edition).
  - .2 A copy of the WorkSafeBC, WHMIS core manual (current edition).
  - .3 WorkSafeBC “**Notice of Project for Employment involving Asbestos**” (NOPA) and, attached to the NOPA, the site-specific asbestos abatement work procedures intended for use.
  - .4 The Contractor’s Corporate Occupational Health & Safety Program.
  - .5 The Contractor’s Exposure Control Plan.
  - .6 Material Safety Data Sheets (MSDS) for regulated products used on the project.
  - .7 Canadian Standards Association, CSA Z-190, “Selection, Care and Use of Respirators” (current edition).
  - .8 Copies of current fit test forms for all employees required to wear a respirator.

### 1.3 Qualifications

- .1 Supervisors and workers for the removal of asbestos-containing materials must have successfully completed a recognized course or equivalent training, in asbestos awareness and abatement.

#### **1.4 Procedures and Requirements**

- .1 Asbestos-containing materials removal (excluding pipe elbow insulation), must be performed following Moderate Risk asbestos work procedures, as defined by the WorkSafeBC Occupational Health & Safety Regulation and these specifications.
- .2 Asbestos-containing pipe elbow insulation removal must be performed following Moderate Risk asbestos work procedures when using the glove bag method of removal, as defined by the WorkSafeBC Occupational Health & Safety Regulation and these specifications.
- .3 The Occupational Health and Safety Consultant and the Owners representative must be notified prior to any disturbance, removal, handling and disposal of asbestos containing materials in addition to those hazardous materials identified elsewhere within these Specifications.
- .4 A copy of the site-specific work procedures intended for use on this project must be submitted to WorkSafeBC with the NOPA.

## **2 DESCRIPTION OF WORK**

### **2.1 General**

- .1 The work specified herein shall be the disturbance, removal, handling and disposal of known asbestos-containing materials, by competent persons trained, knowledgeable and qualified in Moderate Risk work procedures, and Moderate Risk glove-bag work procedures.
- .2 Access to areas of the site where hazardous materials are being removed is to be restricted to, the Prime Contractor (if suitably trained) , the Hazardous Materials Removal Contractor, the Occupational Health and Safety Consultant, the Owner's representative (if suitably trained), and representatives of regulatory agencies who may have jurisdiction. The Hazardous Materials Removal Contractor will instruct and train any visitors requiring access to the work areas on; entry and exit procedures and the use of any appropriate personal protective equipment for the classification of work being conducted at the time of entry. Any worker deemed by the Prime Consultant or the Owner's representative to be inadequately trained, or unfit to perform their duties, will be removed from the project.
- .3 All platforms used to access the hazardous materials will be constructed and used in accordance with the requirements of the WorkSafeBC Occupational Health & Safety Regulation. All elevated platforms for this project, i.e. both rolling and fixed scaffolding, must be engineered, supplied, installed, cleaned and dismantled by the Contractor.
- .4 All required documentation is the responsibility of the Contractor. Site-specific emergency procedures must be provided by the Hazardous Materials Removal Contractor and posted on site.
- .5 The health and safety of Contract employees in the areas affected during hazardous material removal work will be the sole responsibility of the Hazardous Materials Removal Contractor and that Contractor's supervisor must remain on site at all times during abatement work. Should the Hazardous Materials Removal Contractor require the assistance of any other trade during the performance of the work of this project, he will be responsible for providing all necessary equipment and training required to affect that assistance. Any specific trade documentation requirements for items such as lockout procedures, must be provided by a qualified tradesperson.
- .6 The Hazardous Materials Removal Contractor will assume total responsibility for the erection and maintenance of all signs and the integrity of all enclosures and barriers related to the hazardous material removal work.
- .7 The Hazardous Materials Removal Contractor will provide all necessary labour, materials, insurance, permits and equipment necessary to carry out the work in accordance with all applicable regulations and this documentation.

- .8 The Hazardous Materials Removal Contractor will provide all necessary labour and equipment (e.g. GFCI electrical panel, hoses, valves, connections, etc.), to secure the required utilities for all hazardous materials removal work.
- .9 All air monitoring and inspections, if necessary, will be conducted by the Health and Safety Consultant. If air-monitoring results show areas outside enclosures to be contaminated, the Hazardous Materials Removal Contractor will clean these identified areas immediately under direction of the Health and Safety Consultant at no additional cost to the Owner.
- .10 The Hazardous Materials Removal Contractor will not demobilize from an area of removal until the Health and Safety Consultant has inspected the completed area. The Hazardous Materials Removal Contractor will allow sufficient time for fiber settling prior to final air clearance following encapsulation of the work areas, before dismantling the work area enclosures. The dismantling of previously contaminated work areas must be conducted following Moderate Risk work procedures.
- .11 The Hazardous Materials Removal Contractor will allow sufficient time for inspection of the site after set up and before commencement of abatement activities and must not begin work in a new area without informing the Prime Consultant.
- .12 All HEPA vacuums and negative-air units on the project are to be D.O.P. (dioctyl phthalate) or P-A-O (poly alfa olefin) tested at the beginning of the project, and from that point on, at the discretion of the Health and Safety Consultant.

## **2.2 Asbestos containing materials impacted by this project**

- .1 The following lists the type of hazardous materials with their known location and the Risk Level appropriate for the nature of their disturbance in compliance with the current WorkSafeBC Occupational Health & Safety Regulation.
- .2 If any asbestos containing materials not specified herein, are impacted by the scheduled renovation, the Hazardous Materials Removal Contractor is to stop work and wait to receive direction from the Owner's Representative.

## **2.3 Asbestos-containing materials**

- .1 All specified areas of asbestos removal include the removal of all settled dust, debris, and all generated waste materials, in accordance with Moderate Risk and Moderate Risk glove bagging asbestos abatement procedures, from the following areas:
  - .1 The removal of asbestos-containing window putty from 1988 windows will be performed following Moderate Risk asbestos abatement procedures. Asbestos containing window putty is located in the following areas:
    - (i) All windows date stamped 1988 located on the main floor and not including recent builds in the secure passenger area.
  - .2 The removal of vinyl floor tile and adhesive mastic will be performed following Moderate Risk asbestos abatement procedures. Asbestos containing vinyl floor tile and adhesive mastic is located in the following areas:
    - (i) Green vinyl floor tile and adhesive mastic in Breaker Room B
    - (ii) Yellow vinyl floor tile and associated adhesive mastic in the S4G Admin Office and adjacent Hallway
    - (iii) Yellow vinyl floor tile and associated adhesive mastic on the 2<sup>nd</sup> Floor Landing
    - (iv) Green vinyl floor tile and adhesive mastic at the top of the Stairwell
  - .3 The removal of pipe thread compound will be performed following Moderate Risk asbestos abatement procedures. Asbestos containing pipe thread compound is located in the following areas:
    - (i) On threaded piping throughout the building including the Crawlspace.

- .4 The removal of firestop compound will be performed following Moderate Risk asbestos abatement procedures. Asbestos containing fire stop compound is located in the following areas:
  - (i) Throughout the entire building
- .5 The removal of pipe elbow insulating cement will be performed following Moderate Risk Glove-bag asbestos abatement procedures. Asbestos containing pipe elbow parging is located in the following areas:
  - (i) Basement crawlspace
  - (ii) Mechanical room/Boiler room
- .6 The removal of brown caulking must be performed following Moderate Risk asbestos abatement procedures. Asbestos containing brown caulking is located in the following areas:
  - (i) Air Canada door frame on door to the tarmac
  - (ii) Door frames present in other parts of the building

#### **2.4 Mercury-containing thermostats**

- .1 Several mercury containing thermostats were observed on site. The mercury contained within the thermostats, is classified as a Special Waste material. The mercury must be disposed of in accordance with the requirements of the BC Ministry of Environment regulations.

#### **2.5 Chlorofluorocarbons (CFC's)**

- .1 Fridge/freezers and air conditioning units may contain CFC's and must therefore be disposed of in accordance with the B.C. Ministry of Environment's Provincial Ozone-Depleting Substances and Halocarbons Regulations (2004). The fridge/freezers must be treated as CFC-containing.

#### **2.6 Polychlorinated Biphenyls (PCB's)**

- .1 Observed fluorescent light fixtures might contain PCB's within the light ballasts. All light ballasts within any removed fixtures, must be inspected to determine whether they contain PCB's. The fixture must be de-energized, the ballasts removed from the light fixture and placed in a secured area for inspection. If they are determined to contain PCB's they will have to be disposed of at an approved disposal facility.

### **3 WASTE HANDLING AND DISPOSAL**

#### **3.1 General**

- .1 Disposal of all hazardous waste will be performed in accordance with the Ministry of Environment-Waste Management Branch and TDGA regulations pertaining to hazardous waste.
- .2 The Owner will provide to the Contractor a British Columbia waste generator number (BCG No.), that must appear on all waste transfer manifests, if required.

### **4 MANAGEMENT SERVICES**

#### **4.1 General**

- .1 The Health and Safety Consultant for this project will be Total Safety Services.
- .2 All air monitoring and inspections will be conducted by the Health and Safety Consultant.
- .3 The Health and Safety Consultant will have full access to all documentation.
- .4 No hazardous materials removal work will be undertaken without prior communication with the Health and Safety Consultant.



## **1 LEAD GENERAL**

Work this specification section with Hazardous Materials Survey included in these Specification documents

### **1.1 Section Includes**

- .1 The disturbance, handling, removal, and disposal of lead-containing coatings from the specified areas of Smithers Airport located at 6421 Airport Road No. 1, Smithers, BC. It is the intent of this Scope of Work to show the work necessary to complete the lead coating removal.
- .2 The disturbance, handling, removal and disposal of lead-containing materials must be performed in strict compliance with these specifications and with all applicable regulatory requirements.

### **1.2 Documentation**

- .1 The Hazardous Materials Removal Contractor will maintain the following documentation on site.
  - .1 A copy of the WorkSafeBC Occupational Health & Safety Regulation (current edition).
  - .2 A copy of the WorkSafeBC publication *"Lead Containing Paints and Coatings; Preventing Exposure in the Construction Industry"*.
  - .3 A copy of the WorkSafeBC, WHMIS core manual (current edition).
  - .4 WorkSafeBC **"Notice of Project for Employment Involving Lead" (NOPL)** and, attached to the NOPL, the site-specific lead abatement work procedures intended for use.
  - .5 The Contractor's Corporate Occupational Health & Safety Program.
  - .6 The Contractor's Exposure Control Plan.
  - .7 Material Safety Data Sheets (MSDS) for regulated products used on the project.
  - .8 Canadian Standards Association, CSA Z-190, "Selection, Care and Use of Respirators" (current edition).
  - .9 Copies of current fit test forms for all employees required to wear a respirator.

### **1.3 Qualifications**

- .1 Supervisors and workers for the removal of lead-containing materials must have successfully completed a recognized course or equivalent training, in lead awareness and abatement.

### **1.4 Procedures and Requirements**

- .1 Lead-containing materials removal must be performed following Low-Moderate and Moderate Risk lead abatement work procedures, as defined by the WorkSafeBC Occupational Health & Safety Regulation, the WorkSafeBC publication *"Lead Containing Paints and Coatings; Preventing Exposure in the Construction Industry"*, and these specifications.
- .2 The Occupational Health and Safety Consultant and the Owners representative must be notified prior to any disturbance, removal, handling and disposal of lead containing materials in addition to any other hazardous materials identified elsewhere within these Specifications.
- .4 A copy of the site-specific work procedures intended for use on this project must be submitted to WorkSafeBC with the NOPL.

## **2 DESCRIPTION OF WORK**

### **2.1 General**

- .1 The work specified herein shall be the disturbance, removal, handling and disposal of known lead-containing materials, by competent persons trained, knowledgeable and qualified in Low-Moderate and Moderate Risk work procedures.
- .2 Access to areas of the site where hazardous materials are being removed is to be restricted to, the Prime Contractor (if suitably trained) , the Hazardous Materials Removal Contractor, the Health and Safety Consultant, the Owner's representative (if suitably trained), and representatives of regulatory agencies who may have jurisdiction. The Hazardous Materials Removal Contractor will instruct and train any visitors requiring access to the work areas on; entry and exit procedures and the use of any appropriate personal protective equipment for the classification of work being conducted at the time of entry. Any worker deemed by the Prime Consultant or the Owner's representative to be inadequately trained, or unfit to perform their duties, will be removed from the project.
- .3 All platforms used to access the hazardous materials will be constructed and used in accordance with the requirements of the WorkSafeBC Occupational Health & Safety Regulation. All elevated platforms for this project, i.e. both rolling and fixed scaffolding, must be engineered, supplied, installed, cleaned and dismantled by the Contractor.
- .4 All required documentation is the responsibility of the Contractor. Site-specific emergency procedures must be provided by the Hazardous Materials Removal Contractor and posted on site.
- .5 The health and safety of Contract employees in the areas affected during hazardous material removal work will be the sole responsibility of the Hazardous Materials Removal Contractor and that Contractor's supervisor must remain on site at all times during abatement work. Should the Hazardous Materials Removal Contractor require the assistance of any other trade during the performance of the work of this project, he will be responsible for providing all necessary equipment and training required to affect that assistance. Any specific trade documentation requirements for items such as lockout procedures, must be provided by a qualified tradesperson.
- .6 The Hazardous Materials Removal Contractor will assume total responsibility for the erection and maintenance of all signs and the integrity of all enclosures and barriers related to the hazardous material removal work.
- .7 The Hazardous Materials Removal Contractor will provide all necessary labour, materials, insurance, permits and equipment necessary to carry out the work in accordance with all applicable regulations and this documentation.
- .8 The Hazardous Materials Removal Contractor will provide all necessary labour and equipment (e.g. GFCI electrical panel, hoses, valves, connections, etc.), to secure the required utilities for all hazardous materials removal work.
- .9 All air monitoring and inspections, if necessary, will be conducted by the Health and Safety Consultant. If air-monitoring results show areas outside enclosures to be contaminated, the Hazardous Materials Removal Contractor will clean these identified areas immediately under direction of the Health and Safety Consultant at no additional cost to the Owner.
- .10 The Hazardous Materials Removal Contractor will not demobilize from an area of removal until the Health and Safety Consultant has inspected the completed area. The Hazardous Materials Removal Contractor will allow sufficient time for wipe sampling of work areas and adjacent areas and the subsequent analysis time following lead abatement activities, before dismantling the work area enclosures. The dismantling of previously contaminated work areas must be conducted following Moderate Risk work procedures.
- .11 The Hazardous Materials Removal Contractor will allow sufficient time for inspection of the site after set up and before commencement of abatement activities and must not begin work in a new area without informing the Prime Consultant.
- .12 All HEPA vacuums and negative-air units on the project are to be D.O.P. (dioctyl phthalate) or P-A-O (poly alfa olefin) tested at the beginning of the project, and from that point on, at the discretion of the Health and Safety Consultant.

## 2.2 Lead containing materials impacted by this project

- .1 The following lists the type of hazardous materials with their known location and the Risk Level appropriate for the nature of their disturbance in compliance with the current WorkSafeBC Occupational Health & Safety Regulation.
- .2 If any lead-containing materials not specified herein are impacted by the scheduled renovation, the Hazardous Materials Removal Contractor is to stop work and wait to receive direction from the Owner's Representative.

### **2.3 Lead-containing materials**

- .1 All areas of lead abatement include the removal of all settled dust, debris, and all generated waste materials, in accordance with Low-Moderate and Moderate Risk lead abatement procedures. The following areas are lead containing, if these areas are impacted by the planned renovations and expansion activities, lead abatement procedures are required;
  - .1 The disturbance of lead-containing paint from drywall, plaster, or stucco will be performed following Low-Moderate or Moderate Risk lead abatement procedures as outlined in the WorkSafeBC publication "*Lead Containing Paints and Coatings; Preventing Exposure in the Construction Industry*". Lead containing coatings are located in the following areas:
    - (i) Green paint on drywall at the South-west Entrance and throughout
    - (ii) White paint on drywall in the Sitting area, Luggage Carousel Room, and throughout
    - (iii) Peach paint on drywall in the CMA Office area and throughout
    - (iv) Yellow paint on plaster in the Basement Hall and throughout
    - (v) White paint on plaster in the Staff Washroom, Handicapped Washroom and throughout
    - (vi) Blue paint on roof flashings
    - (vii) White paint on exterior stucco throughout
  - .2 Metal painted with lead containing paint can be recycled. The recycling facility must be informed of the presence of lead containing paint.

## **3 WASTE HANDLING AND DISPOSAL**

### **3.1 General**

- .1 Disposal of all hazardous waste will be performed in accordance with the Ministry of Environment-Waste Management Branch and TDGA regulations pertaining to hazardous waste.
- .2 The Owner will provide to the Contractor a British Columbia waste generator number (BCG No.), that must appear on all waste transfer manifests, if required.

## **4 MANAGEMENT SERVICES**

### **4.1 General**

- .1 The Health and Safety Consultant for this project will be Total Safety Services.
- .2 All air monitoring and inspections will be conducted by the Health and Safety Consultant.
- .3 The Health and Safety Consultant will have full access to all documentation.
- .4 No hazardous materials removal work will be undertaken without prior communication with the Health and Safety Consultant.

## **SECTION 03 33 31 – CAST-IN-PLACE CONCRETE**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Finishing slabs-on-grade
- .2 Concrete walls & Footings

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Structural Drawings and Instructions.

#### **1.3 REFERENCES**

- .1 CSA-A23.1-09/A23.2-09 - Concrete Materials and Methods of Concrete Construction / Methods of Test for Concrete.
- .2 ACI 302.1R-04 - Guide for Concrete Floor and Slab Construction.
- .3 ACI Standards: Comply with ACI 303.1, "Specification for Cast-in-Place Architectural Concrete"; ACI 301, "Specification for Structural Concrete"; and ACI 117, "Specifications for Tolerances for Concrete Construction and Materials," unless more stringent provisions are indicated.
- .4 ASTM E1155M-96(2008 Determining FF Floor Flatness and FL Floor Levelness Numbers) .

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination: Coordinate with concrete floor placement and concrete floor curing, and other work having a direct bearing on work of this section.

#### **1.5 QUALITY ASSURANCE**

- .1 Perform Work in accordance with CSA-A23.1/A23.2.
- .2 Section 01 43 00 Quality Assurance
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience and approved by the manufacturer.
- .4 Mockups (Sample Panels): Before casting architectural concrete, produce a minimum of three (3) sets of full-scale sample panels, cast vertically, approximately minimum, to demonstrate the expected range of finish, color, joint types, patching, sacking, and texture variations.

#### **1.6 ENVIRONMENTAL REQUIREMENTS**

- .1 Temporary Lighting: Minimum 200 W light source, placed 2.5 m above the floor surface, for each 40 sq m of floor being finished.

## **PART 2 - Products**

## **PART 3 - Execution**

### **3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that floor surfaces are acceptable to receive the work of this section.

### **3.2 FORM-FACING MATERIALS**

- .1 General: Comply with Division 3 Section 03300 "Cast-in-Place Concrete" for formwork and other form-facing material requirements.
- .2 Form-Facing hand set Panels for cast-in-place Concrete Wall Finishes:
  - .1 Type 2: Plywood, nonabsorptive panels, for smooth concrete finishes that will provide continuous, true, and smooth architectural concrete surfaces. Furnish in largest practicable sizes to minimize number of joints. Sand blast finish.
- .3 Form Liners: Units of face design, texture, arrangement, and configuration. Provide solid backing and form supports to ensure that form liners remain in place during concreting. Furnish with manufacturer's recommended liquid-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent surface treatments of concrete.
- .4 Chamfer Strips
  - .1 Type 1: square edges, no chamfer
  - .2 Type 2: Metal, rigid plastic, elastomeric rubber, or dressed wood ; nonstaining.
- .5 Form Ties
  - .1 Type 1 formwork: flat 1" x 1/8", stainless steel STRAP TIES, square edges. Snap off.
  - .2 Type 2 formwork: Factory-fabricated, removable ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal. Do not use cone nuts
- .6 Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected bar supports.

### **3.3 CONCRETE MATERIALS and MIXES**

- .1 As per the Structural drawing Instructions

### **3.4 FORMWORK**

- .1 Comply with Division 3 Section 03300 "Cast-in-Place Concrete" for formwork, embedded items, and shoring and reshoring.
- .2 In addition to ACI 303.1 limits on form-facing panel deflection, limit concrete surface irregularities, designated by ACI 347R.
- .3 Chamfer exterior corners and edges of cast-in-place architectural concrete for Wall Type 2 formwork. Wall Type 1 formwork provide square corners.
- .4 Clean forms and adjacent surfaces to receive concrete.
- .5 Seal form joints and penetrations at form ties with form joint tape or form joint sealant to prevent mortar leaks.

- .6 Place form liners accurately to provide finished surface texture indicated. Provide solid backing and attach securely to prevent deflection and maintain stability of liners during concreting. Prevent form liners from sagging and stretching in hot weather. Seal joints of form liners and form liner accessories to prevent mortar leaks. Coat form liner with form-release agent.

### **3.5 REINFORCEMENT AND INSERTS**

- .1 Comply with Division 3 Section 03300 "Cast-in-Place Concrete" for fabricating and installing steel reinforcement.
- .2 Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

### **3.6 REMOVING AND REUSING FORMS**

- .1 Formwork, for sides of beams, walls, columns, and similar parts of the Work, that does not support weight of concrete may be removed after cumulatively curing at not less than for 24 hours after placing concrete.
  - .1 Cut off and grind glass-fiber-reinforced plastic form ties flush with surface of concrete.
- .2 Leave formwork, for beam soffits, joists, slabs, and other structural elements, that supports weight of concrete in place until concrete has achieved 28-day design compressive strength. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- .3 When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for architectural concrete surfaces.

### **3.7 JOINTS**

- .1 Construction Joints: Install construction joints true to line with faces perpendicular to surface plane of cast-in-place architectural concrete so strength and appearance of concrete are not impaired, at locations indicated or as approved by the Consultant.
  - .1 Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated.
  - .2 Maintain on-hand materials as necessary, and install construction joint, whenever interruptions of concrete placement may otherwise result in a cold joint.
- .2 Contraction Joints: Form weakened-plane contraction joints true to line with faces perpendicular to surface plane of cast-in-place architectural concrete so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

### **3.8 CONCRETE PLACEMENT**

- .1 Do not add water to concrete during delivery, at Project site, or during placement, unless approved by the **referenced standard ADD 2**.
- .2 Deposit concrete in forms in horizontal layers no deeper than and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.
  - .1 Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
  - .2 Do not use vibrators to transport concrete inside forms.
- .3 Cold-Weather Placement: Comply with ACI 306.1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
- .4 Hot-Weather Placement: Place concrete according to recommendations in ACI 305R.

### **3.9 CONCRETE WALL FINISHES, GENERAL**

- .1 Architectural Concrete Finish: Form-Facing Panels for cast-in-place Concrete Wall Finishes:
  - .1 Type 1: 8" Cedar Plank Formed Concrete: Rough Cut Finish, cedar planks, horizontal, square edges and corners. See the architectural drawings for wall locations to receive this formwork.
  - .2 Type 2: Plywood, non-absorptive panels, for smooth concrete finishes.
- .2 Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces.
  - .1 Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.
- .3 Form Liner Finish: Cast panel against form liners placed, secured, and sealed over formwork panels to produce a textured surface free of pockets, streaks, and honeycombs. Produce a surface appearance of uniform color and texture.

### **3.10 CONCRETE CURING**

- .1 Begin curing immediately after removing forms from concrete. Cure by one or a combination of curing compound methods that will not mottle, discolor, or stain concrete.

### **3.11 FIELD QUALITY CONTROL**

- .1 Comply with Division 3 Section 03300 "Cast-in-Place Concrete" for field quality-control requirements.

### **3.12 REPAIRS, PROTECTION, AND CLEANING**

- .1 Repair and cure damaged finished surfaces of cast-in-place architectural concrete when approved by Consultant. Match repairs to color, texture, and uniformity of surrounding surfaces and to repairs on approved mockups.
  - .1 Remove and replace cast-in-place architectural concrete that cannot be repaired and cured to Consultants approval.
- .2 Protect corners, edges, and surfaces of cast-in-place architectural concrete from damage; use guards and barricades.

### **3.13 FLOOR FINISHING**

- .1 Finish concrete floor surfaces to CSA-A23.1/A23.2.
- .2 Steel trowel surfaces which will receive carpeting, resilient flooring, thin set quarry tile.
- .3 Steel trowel surfaces which are scheduled to be exposed.

### **3.14 TOLERANCES**

- .1 Measure for floor flatness ( $F_F$ ) and floor levelness ( $F_L$ ) tolerances for floors to ASTM E1155M , within 48 hours after slab installation. Floor flatness not to exceed 5 mm in 3050 mm .
- .2 Finish concrete to achieve the following tolerances:
  - .1 Under Glazed Tile on Setting Bed:  $F (F_F)$  20 and  $F (F_L)$  15.
  - .2 Under Resilient and Carpet Finishes:  $F (F_F)$  25 and  $F (F_L)$  20.
  - .3 Exposed to View and Foot Traffic:  $F (F_F)$  35 and  $F (F_L)$  25.
- .3 Correct the slab surface if the actual  $F (F_F)$  or  $F (F_L)$  number for the floor installation measures less than required.

- .4 Identify areas of work not within tolerance. Correct defects in the defined traffic floor by grinding and filling or removal and replacement of the defective work. Re-measure corrected areas by the same process.

**END OF SECTION**



## **SECTION 03 35 10 - CONCRETE FLOOR FINISHING**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Finishing slabs-on-grade.
- .2 Provide a level and smooth surface prior to the installation of floor covering over a variety of substrates including concrete floor.
- .3 Cast concrete walls with board finish

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 03 30 00 - Cast-in-place Concrete: Prepared concrete floors ready to receive finish.

#### **1.3 REFERENCES**

- .1 CSA-A23.1-09/A23.2-09 - Concrete Materials and Methods of Concrete Construction / Methods of Test for Concrete.
- .2 ACI 302.1R-04 - Guide for Concrete Floor and Slab Construction.
- .3 ASTM E1155M-96(2008 Determining FF Floor Flatness and FL Floor Levelness Numbers) .

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination: Coordinate with concrete floor placement and concrete floor curing, and other work having a direct bearing on work of this section.

#### **1.5 QUALITY ASSURANCE**

- .1 Perform Work in accordance with CSA-A23.1/A23.2.
- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience and approved by the manufacturer.

#### **1.6 ENVIRONMENTAL REQUIREMENTS**

- .1 Temporary Lighting: Minimum 200 W light source, placed 2.5 m above the floor surface, for each 40 sq m of floor being finished.

### **PART 2 - Products**

#### **2.1 MATERIAL –CEMENT BASED SMOOTHING COMPOUND**

- .1 Acceptable Product: Ardex Feather Finish system

- .2 Interior use over dry substrates only.
- .3 Follow the directives of the floorcovering manufacturer regarding the maximum allowable substrate moisture content and test the substrate prior to installing Ardex Feather Finish.
- .4 Allow for test areas to determine the suitability of the products for the intended use.
- .5 Acid etching, adhesive removers, solvents and sweeping compounds are not acceptable means for cleaning the substrate.
- .6 Substrate and ambient temperatures must be a minimum of 50°F (10°C) for the installation of ARDEX products.
- .7 Surface Preparation: Concrete floors must be structurally sound, clean and free of dirt, dust, oil, curing and sealing compounds and any other surface contaminant which may act as a bond breaker. Where required, mechanically clean the floor using recommended preparation methods such as shotblasting, scarifying, diamond grinding, shaving or other acceptable methods to a suitable surface. Acid etching is not an acceptable method of cleaning the subfloor. Do not use solvents or sweeping compounds. Subfloor temperatures must be a minimum of 10°C.
- .8 Surface Preparation Non-porous Substrates: Including terrazzo, burnished concrete, epoxy coating systems, and ceramic and quarry tile. The subtrade must be clean, including the complete removal of existing waxes and sealers, dust, dirt, debris and any other contaminant that may act as a bond breaker. Substrate preparation must be by mechanical means, such as shot blasting.
- .9 Surface Preparation Metal: Metal substrates must be rigid, well supported, properly anchored, and free of undue flex and vibration. They must also be clean, including the complete mechanical removal of rust, corrosion and any contaminant that may act as a bond breaker. It is the responsibility of the installation contractor to ensure that this is so. To prevent rust from recurring, steel surfaces must be coated with an anticorrosive epoxy coating and allowed to dry thoroughly. The coating must be installed in strict accordance with the coating manufacturer's written recommendations and allowed to cure fully. Lead, copper and aluminum do not need to be coated with an anticorrosive coating.
- .10 Surface Preparation Wood: The wood subfloor must be constructed according to prevailing building codes and must be solid and securely fixed to provide a rigid base free of undue flex. Any boards exhibiting movement must be re-nailed. The surface of the wood must be clean and free of oil, grease, wax, dirt, varnish, shellac and any contaminant that might act as a bond breaker. If necessary, sand down to bare wood. A commercial drum sander can be used to sand large areas. Do not use solvents, strippers or cleaners. Vacuum all dust and debris. It is the responsibility of the installation contractor to ensure that the wood subfloor is thoroughly clean and properly anchored prior to the installation of any ARDEX material.
- .11 Surface Preparation Asbestos-Containing Materials: When removing existing flooring, any asbestos-containing materials should be handled and disposed of in accordance with applicable federal, state and local regulations.
- .12 Installation: Applied to any prepared surface using a steel trowel. Apply sufficient pressure to fill all defects and to feather the product into the subfloor surface. It is not necessary to leave a minimum thickness on the substrate. Use the least amount possible to obtain the desired smoothness.
- .13 Recommended Tools: ARDEX T-2 Ring Mixing Paddle, mixing bucket, margin trowel, steel trowel, razor scraper, and a 1/2" (12 mm) heavy-duty drill (min. 650 rpm)
- .14 Mixing and Application: See Manufacturer's instructions.
- .15 Priming: See Manufacturer's instructions.

### **PART 3 - Execution**

#### **3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.

- .2 Verify that floor surfaces are acceptable to receive the work of this section.

### **3.2 FLOOR FINISHING**

- .1 Finish concrete floor surfaces to CSA-A23.1/A23.2.
- .2 Steel trowel surfaces which will receive carpeting, resilient flooring, thin set quarry tile.
- .3 Steel trowel surfaces which are scheduled to be exposed.
- .4 In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains at nominal 10 mm per m as indicated on drawings.

### **3.3 TOLERANCES**

- .1 Measure for floor flatness ( $F_F$ ) and floor levelness ( $F_L$ ) tolerances for floors to ASTM E1155M , within 48 hours after slab installation. Floor flatness not to exceed 5 mm in 3050 mm .
- .2 Finish concrete to achieve the following tolerances:
  - .1 Under Glazed Tile on Setting Bed:  $F (F_F)$  20 and  $F (F_L)$  15.
  - .2 Under Resilient and Carpet Finishes:  $F (F_F)$  25 and  $F (F_L)$  20.
  - .3 Exposed to View and Foot Traffic:  $F (F_F)$  35 and  $F (F_L)$  25.
- .3 Correct the slab surface if the actual  $F (F_F)$  or  $F (F_L)$  number for the floor installation measures less than required.
- .4 Identify areas of work not within tolerance. Correct defects in the defined traffic floor by grinding and filling or removal and replacement of the defective work. Re-measure corrected areas by the same process.

### **END OF SECTION**

## **SECTION 05 50 00 - METAL FABRICATIONS**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Fabrication and supply of all metal fabrication and ornamental metal items complete with fasteners and accessories.
- .2 Factory applied finishes as scheduled and indicated on drawings.
- .3 Engineering by Trade Contractor.

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 73 50 Environmental Protection
- .3 Cast-in-place Concrete - Specified on Structural Drawings: Placement of metal fabrications in concrete.
- .4 Section 05 12 00 - Structural Steel: Structural steel column anchor bolts.
- .5 Section 09 91 10 - Painting: Paint finish.

#### **1.3 REFERENCES**

- .1 ASTM A53/A53M-07 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
- .2 ASTM A153/A153-09 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .3 ASTM A307-07b - Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .4 ASTM A500/A500M-09 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- .5 ASTM A501-07 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- .6 CAN/CGSB-1.40-97 - Anti-corrosive Structural Steel Alkyd Primer.
- .7 CAN/CGSB-1.181-99 - Ready-Mixed, Organic Zinc-Rich Coating.
- .8 CAN/CSA-G40.20-04/G40.21-04 (R2009) - General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .9 CSA-W47.1-09 - Certification of Companies for Fusion Welding of Steel Structures.
- .10 CSA-W48-06 - Filler Metals and Allied Materials for Metal Arc Welding
- .11 CSA-W55.3-08 - Certification of Companies for Resistance Welding of Steel and Aluminum.
- .12 CSA-W59-03 (R2008) - Welded Steel Construction (Metal Arc Welding).
- .13 SSPC (The Society for Protective Coatings) - Steel Structures Painting Manual.

#### **1.4 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.

.2 Shop Drawings:

- .1 Submit Engineered Shop Drawing signed and sealed by a qualified Engineer registered to practice in the province of British Columbia.
- .2 Submit Structural Schedule S-B prior to fabrication of this Work, and Structural Schedule S C-B on completion of Work and prior to request for Substantial Performance of Contract.
- .3 Indicate materials, core thicknesses, profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
- .4 Indicate welded connections using standard welding symbols. Indicate net weld lengths.

**1.5 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.

**1.6 CLOSEOUT SUBMITTALS**

- .1 Section 01 78 10: Submission procedures.

**1.7 QUALITY ASSURANCE**

- .1 Welded Steel Construction: CSA-W59.

**1.8 CO-ORDINATION WITH OTHER TRADES**

- .1 Supply all necessary instructions and drawings to other trades for setting bearing plates, anchor bolts and other members that are to be built in with work of other trades.
- .2 Supply necessary materials for building in at the correct time.
- .3 Check openings and support requirements for mechanical and electrical equipment with equipment suppliers.

**PART 2 - Products**

**2.1 MATERIALS - STEEL**

- .1 Steel Sections and Plates: CAN/CSA-G40.20/G40.21, Grade as listed on Structural Drawings .
- .2 Bolts, Nuts, and Washers: ASTM A307, galvanized to ASTM A153/A153M for galvanized components.
- .3 Welding Materials: Type required for materials being welded.
- .4 Welding Filler Material: CSA-W48.
- .5 Primer: As specified in Section 09 91 10.
- .6 Touch-Up Primer for Galvanized Surfaces: CAN/CGSB-1.181 zinc rich.

**2.2 Stainless Steel**

- .1 Stainless steel shall be grade and type designated below for each form required:
- .2 Plate: ASTM A264-12, Type 316.
- .3 Bar Stock: ASTM A276-12A, Type 316

- .4 Tubing: ASTM A511/511M-12, Type 316
- .5 Pipe: ASTM A312-14,
- .6 Note: in all cases type 316L may be used for welded fabrication

## **2.3 FABRICATION**

- .1 Fit and shop assemble items in largest practical sections, for delivery to site.
- .2 Fabricate items with joints tightly fitted and secured.
- .3 Continuously seal joined members by continuous welds.
- .4 Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- .5 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- .6 Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

## **2.4 FABRICATION TOLERANCES**

- .1 Squareness: 3 mm maximum difference in diagonal measurements.
- .2 Maximum Offset Between Faces: 1.6 mm .
- .3 Maximum Misalignment of Adjacent Members: 1.6 mm .
- .4 Maximum Bow: 3 mm in 1.2 m .
- .5 Maximum Deviation From Plane: 1.6 mm in 1.2 m

## **2.5 FINISHES - STEEL**

- .1 Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- .2 Do not prime surfaces in direct contact with concrete or where field welding is required.
- .3 Prime paint items with one (1) coat.
- .4 Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M. Provide minimum 600 g/sq m .
- .5 Non-structural Items: Galvanized after fabrication to ASTM A123/A123M. Provide minimum 380 g/sq m galvanized coating.

## **PART 3 - Execution**

### **3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that field conditions are acceptable and are ready to receive work.
- .3 Verify dimensions, tolerances, and method of attachment with other work.

### **3.2 PREPARATION**

- .1 Clean and strip primed steel items to bare metal where site welding is required.
- .2 Supply steel items required to be cast into concrete or with setting templates to appropriate sections.

### **3.3 INSTALLATION**

- .1 Install items plumb and level, accurately fitted, free from distortion or defects.
- .2 Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- .3 Field weld components indicated on Shop Drawings.
- .4 Perform field welding to CSA requirements.
- .5 Obtain approval prior to site cutting or making adjustments not scheduled.
- .6 After erection, prime welds, abrasions, and surfaces not shop primed, galvanized, except surfaces to be in contact with concrete.

### **3.4 ERECTION TOLERANCES**

- .1 Section 01 73 00: Tolerances.
- .2 Maximum Variation From Plumb: 6 mm per story, non-cumulative.
- .3 Maximum Offset From True Alignment: 6 mm .
- .4 Maximum Out-of-Position: 6 mm .

### **3.5 SCHEDULES**

- .1 The following Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.
- .2 Stairs, landings, Guardrails and handrails.
- .3 Screen wall frames.
- .4 Ledger and lintel angles.
- .5 Bollards
- .6 Overhead Door Frames

**END OF SECTION**

## **SECTION 06 11 00 - WOOD FRAMING**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Wood stud framing
- .2 Roof sheathing.
- .3 Concealed wood blocking
- .4 Douglas Fir Soffits

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 73 50 – Environmental Protection

#### **1.3 REFERENCES**

- .1 CANPLY (Canadian Plywood Association) - Grading and certification.
- .2 CSA-O121-08 - Douglas Fir Plywood.
- .3 CSA-O151-09 - Canadian Softwood Plywood.
- .4 CSA-O325-07 - Construction Sheathing.
- .5 APA (American Plywood Association) - Grades and Specifications.
- .6 NLGA (National Lumber Grades Authority) - Standard Grading Rules for Canadian Lumber, 2007 Edition.

#### **1.4 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.
- .3 Prepare sample soffit for approval to confirm suitable match with CLT panel underside.

#### **1.5 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.

#### **1.6 CLOSEOUT SUBMITTALS**

- .1 Section 01 78 10: Submission procedures.

#### **1.7 QUALITY ASSURANCE**

- .1 Perform Work in accordance with the following agencies:



- .1 Lumber Grading Agency: Certified by NLGA.
- .2 Plywood Grading Agency: Certified by CANPLY.
- .2 Design structural shop fabricated trusses under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the place where the Project is located.

### **1.8 DELIVERY, STORAGE, AND PROTECTION**

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Protect materials from warping or other distortion by stacking in vertical position; store on raised supports; cover materials with waterproof covering; provide adequate air circulation and ventilation.
- .3 Do not store seasoned materials in wet or damp areas.

## **PART 2 - Products**

### **2.1 LUMBER MATERIALS**

- .1 Refer to Architectural Drawings and Specifications.

### **2.2 SHEATHING MATERIALS**

- .1 Refer to Architectural Drawings and Specifications.

### **2.3 SHEATHING AND UNDERLAYMENT LOCATIONS**

- .1 Refer to Structural Drawings and Specifications.

### **2.4 ACCESSORIES**

- .1 Refer to Architectural Drawings and Specifications.
- .2 Fasteners and Anchors:
  - .1 Fasteners: Hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
  - .2 Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete.

## **PART 3 - Execution**

### **3.1 FRAMING**

- .1 Refer to Architectural Drawings
- .2 Set framing members level and plumb, in correct position.
- .3 Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- .4 Coordinate installation of wood decking.
- .5 Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.

- .6 Coordinate curb installation with installation of decking and support of deck openings and parapet construction.

### **3.2 SHEATHING**

- .1 Refer to Architectural Drawings, 16mm tongue and groove plywood sheathing.

### **3.3 DOUGLAS FIR SOFFITS**

Soffits, specified to be Douglas fir on the drawings shall be from Douglas Fir 2x6 appearance grade, identical appearance grade, planed, finished and visual installed appearance as underside of the CLT panels used elsewhere in the project. Submit sample for approval before proceeding.

### **3.4 ERECTION TOLERANCES**

- .1 Section 01 73 00: Tolerances.
- .2 Surface Flatness of Roof Sheathing: maximum, and 13 mm in 9 m maximum.

### **3.5 SCHEDULES**

- .1 Refer to Structural Drawings and Specifications.
- .2 Below Grade Joist and Stud Framing: Stress Group B, pressure preservative treatment.
- .3 Blocking and Cants: S/P/F species, pressure preservative treatment.
- .4 Douglas Fir soffits where shown on architectural ceiling plan.

### **END OF SECTION**

## **PART 1 GENERAL**

### **1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to work of this section.

### **1.02 SUMMARY**

- A. This Section includes Cross Laminated Timber (CLT) Roof and Wall Panels as shown on the drawings.

### **1.03 REFERENCES**

- A. ANSI D3737-07 Structural Glued Laminated Timber.
- B. AITC 405 and ASTM D2559-00 Standards for Wood Adhesives.
- C. ANSI A190.1-2002 Structural Glued-laminated.
- D. APA Standard for Performance Related CLT- ANSI/APA PRG 320/2012.

### **1.04 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include panel location plans, dimensions, shapes and sections, openings, support conditions, connections.
  - 1. Indicate lifting connections.
  - 2. Indicate locations, tolerances, and details of anchorage to supporting structure.
  - 3. Include and locate openings larger than 10 inches.
  - 4. Indicate location of CLT panel by same identification mark placed on panel.
  - 5. Indicate relationship of CLT panels to adjacent materials.
  - 6. Clearly indicate stress grade, service grade, appearance grade.
  - 7. Provide three dimensional models of all interfaces, CLT panels, secondary timber members, plus all connections.
- C. CLT supplier to provide a fully accurate three-dimensional (3D) model of the interfaces (supports, abutments, etc.), CLT panels, secondary timber members, plus all connections prior to submission of shop drawings. Model to be generated using CADWorkv22, or approved alternate (compatible with AutoCAD 2011). 3D model to use as-built foundation X, Y, Z coordinates for CLT panel bases.
- D. Structural design calculations: When required by contract drawings provide CLT structural design calculations, by a registered Professional Engineer.
- E. Samples:
  - 1. Submit 1 sample of CLT panel; approximately 12 by 12 by 3.9 inches for field applied coatings by others.
- F.
- G.
- H. VOC Content: Product data and material safety data sheets (MSDS) for the CLT adhesive used on the interior of the building indicating chemical composition and VOC content.

### **1.05 QUALITY ASSURANCE**

A. Manufacturer's Qualifications:

1. Certified by APA The Engineered Wood Association for compliance with ANSI/APA PRG 320/2011 and passed all of its testing standards.

B. Design Standards:

1. Comply with the National Design Specification for Wood Construction NDS 2005 applicable to types of CLT panels indicated.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

A. Support units during shipment on non-staining material in same position as during storage.

B. Store units with adequate bracing and protect units to prevent contact with soil and separated with striping (so air may circulate around all faces of members), to prevent staining, and to prevent cracking, distortion, warping or other physical damage.

1. Place stored units so identification marks are clearly visible.

C. Handle and transport units in a position consistent with their shape and design in order to avoid excessive stresses that would cause cracking or damage. Protect corners with wood blocking.

D. Lift and support units only at designated points shown on Shop Drawings.

E. Slit underside of membrane covering during storage at Site. Do not deface members.

F. Cover top and sides with opaque moisture resistant membrane.

G. Maintain protection of CLT panel at all times during construction.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

A. Manufacturers: Subject to compliance with requirements, provide products as indicated on drawings by the following manufacturer; (alternates may be submitted for approval not less than 6 days before tender close).

1. Structurlam Products Ltd, 2176 Government Street, Penticton, B.C., Canada V2A 8B5  
Kris Spickler, 916-797-5588, [kspickler@structurlam.com](mailto:kspickler@structurlam.com)

### **2.02 MATERIALS**

A. Wood Species –No.1/No.2 Spruce-Pine-Fir for Cross Laminated Timber (CLT) panels.

B. Adhesives in compliance with ANSI A190.1, DIN 68141 and EN301 and EN302.

1. Acceptable Product: Purbond HB E452

### **2.03 ACCESSORIES**

A. Steel Connectors: Galvanized Steel.

B. Wrapping Material: Weatherproof, lightproof, stain free material. Cut holes on site and underside of wrapping to avoid accumulation of condensation.

## **2.04 FABRICATION**

- A. Fabricate Cross Laminated Timber (CLT) members in accordance with ANSI/APA PRG 320/2011 except where specified otherwise and to following classifications. Use multiple layers 06 15 43-3 CROSS LAMINATED TIMBER PANELS of 19mm minimum to 38mm maximum thick laminations.
- B. Service grade: interior or exterior as located on drawings.
- C. Appearance Classification:
  - 1. Non-Visual (where panels are concealed):
    - a. Shake and checks allowed, shall not exceed 36" or ¼ of the length.
    - b. Heart or blue stain allowed, not limited.
    - c. Knots well-spaced, quantity not limited.
    - d. Minimal wane on face.
    - e. Side pressure on exposed face not required.
  - 2. Visual (where panels are in view in final construction):
    - a. Utilize SPF, J Grade lumber or DF L3 Grade lumber
    - b. Knots: NLGA Select Structural limitation. Select tight knot.
    - c. Pitch streaks not permitted.
    - d. Wane on face not permitted.
    - e. Side pressure on exposed faces required.
- D. Cross Laminated Timber (CLT) members to be fabricated with ¼" chamfers on long sides.
- E. Cross Laminated Timber (CLT) members to be joined at panel edges using a continuous spline as indicated on drawings.
- F. Mark members for identification during erection. Ensure that marks will be concealed in final assembly for appearance grade members. Clearly mark top surface.
- G. Coat all cuts, holes and slots.
- H. Field apply sealer to all sides of laminated members. Double coat ends of laminated members.
- I. All structural steel connecting CLT panel elements to each other and shall be detailed, and if supplied, test fitted in the shop by the CLT supplier.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION:**

- A. Prior to fabrication, check all dimensions relating to this section of work. Report any discrepancies to Engineer.
- B. Prior to site erection, examine all site conditions and ensure an acceptable condition.

### **3.02 INSTALLATION**

- A. Erect CLT panels in accordance with final reviewed shop drawings.
- B. Make adequate provision for possible erection stresses. Set panel level and plumb to correct positions. Securely brace panels and anchor in place to maintain plumb until permanently secured by finished structure.
- C. Fit CLT panels closely and accurately, without trimming, cutting or other modifications, unless approved in writing by Engineer.
- D. Site cutting or boring of CLT panels, other than shown on shop drawings not permitted without written consent of Engineer.

### **3.03 CLEANING**

A. Clean exposed surfaces of CLT panels after erection and completion of field touch up.

1. Perform cleaning procedures, if necessary, according to CLT manufacturer's written recommendations, Protect other work from staining or damage due to cleaning operations.
2. Do not use cleaning materials or processes that could change the appearance of exposed CLT panels or damage adjacent materials.

## **Part 4 ALTERNATES AND/OR EQUALS**

### **4.01 Base Bid**

Due to the customized detailing and engineering characteristics of the wall and/or roof and/or floor framing assembly, it is a requirement that CrossLam by Structurlam Products Ltd. be used in the base bid.

### **4.02 Alternate Manufacturers**

Other manufacturers' bids are to be listed in the alternate section of your proposal. All framing plans, detailing and calculations for the alternate bids will be reviewed by the owner, architect and engineer for structural performance, possible conflicts with related trades, and compatibility with the overall building requirements and building code.

### **4.03 Alternate Products**

Alternate products will only be permitted if written approval and acceptance is obtained by both architect and owner at least 6 days prior to the bid date.

### **4.04 Acceptable Alternates**

At the discretion of the specifier of record, accepted alternates, meeting ANSI PRG 320, will be listed on the final addendum prior to the bid date.

## **END OF SECTION**

G. Local/Regional Materials: Indicate location of manufacturing facility including name, address

## **PART 1 - GENERAL**

### 1.1. 1.1 SCOPE

- 1.1.1. Supply and Install complete toilet partition systems, as indicated on the drawings and as in these specifications

### 1.2. Shop Drawings

- 1.2.1. Submit shop drawings or catalogue illustrations in accordance with Section 01001 - General Requirements.
- 1.2.2. Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors etc

## **2. PART 2**

### 2.1. TOILET PARTITIONS

- 2.1.1. Core: Solid phenolic plastic
- 2.1.2. Finish: Matt finish melamine fused to core. Colour: to be selected by Architect
- 2.1.3. Doors: 19.0mm thick.
- 2.1.4. Panels: 12.0mm thick.
- 2.1.5. Edges: Polished black.
- 2.1.6. Fire Rating: To meet NFPA Class B, Uniform Building Code Class 1

## 2.2. Urinal Screens

- 2.2.1. 300mm (deep) x 1000mm (high) wall mounted, solid phenolic core.
- 2.2.2. Finish: Matt finish melamine fused to core. Colour: to be selected by Architect
- 2.2.3. Panels: 12.00mm thick.
- 2.2.4. Edges: Polished Black.
- 2.2.5. Fasteners: To be continuous for the entire height of the panel. Refer to drawings.

## 2.3. Hardware

- 2.3.1. General Note, all hardware to be Bobrick .67 Institutional series.
- 2.3.2. Hinges: Gravity type, designed to hold door slightly open to indicate compartment is vacant. Door shall lift from outside for emergency access.
- 2.3.3. Attachment Brackets: Stainless steel.
- 2.3.4. Levelling Saddle: 10.0mm diameter threaded rods secure stile to ceiling supports.
- 2.3.5. Pilaster Shoes: Stainless steel.



- 2.3.6. Fastenings: Stainless Steel, tamperproof machine screws in threaded solid brass inserts factory installed.
- 2.3.7. Accessories: Slide bolt latch, door strike, coat hook and bumper, "D" pull to handicapped units, interior and exterior.
- 2.3.8. Material and Finish: Type 304 satin finish stainless steel.
- 2.3.9. Hardware Location: Hardware and fastenings shall not be visible on the outside of compartments.

2.4. Finishes

2.4.1. Colour: Plastic Laminate colour No 2.

2.5. Acceptable Manufacturers:

2.5.1. Bobrick 1082 Series, overhead braced, floor anchored. (alternates may be submitted up to 6 days before tender close).

**3. PART 3 – EXECUTION**

3.1. Inspection

3.1.1. Inspect the work of others upon which the work of this section depends and report to the Consultant any conditions which would affect the installation and performance of the work.

3.1.2. Obtain all dimensions affecting the work of this section from the job site.

3.1.3. Ensure anchorage reinforcing built in walls and ceilings is properly located to receive partition system. (Note that general contractor is responsible for design and installation of professionally engineered structural ceiling suspension system, complete with RPB/RPC certifications)

3.2. Installation

3.2.1. Install partitions and screens as indicated on the drawings, reviewed shop drawings and in accordance with the manufacturer's printed instructions.

3.2.2. Fasten brackets to substrates using fasteners designed to suit substrate conditions and provide permanent, secure anchorage under heavy use.

3.2.3. Ensure that fasteners do not cause ceramic tiles to crack, split, chip or be wedged apart.

3.2.4. Install partitions secure, plumb and square. Centre each cubicle screen on plumbing fixture except where specifically dimensioned otherwise.

- 3.2.5. Leave 12.0mm space between wall and panel or end pilaster. Close to view with privacy channel filler at end.
- 3.2.6. Provide for adjustment of ceiling variations with screw jack through steel saddles made integral with pilaster. Conceal leveling assembly with stainless steel shoes.
- 3.2.7. Adjust and align all hardware and doors. Adjust hinges to align door in partial open position when unlatched.

3.3. Inspection & Adjustment

- 3.3.1. Upon completion of the installation, adjust all components for proper operation and straight alignment, and touch up all scratches and abrasions to be completely invisible.
- 3.3.2. Repair any adjacent finishes damaged during installation.
- 3.3.3. Cleaning: Clean partitions and doors upon completion and leave free from imperfections.

## **PART 1 GENERAL**

### **1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to work of this section.

### **1.02 SUMMARY**

- A. This Section includes Cross Laminated Timber (CLT) Roof and Wall Panels as shown on the drawings.
- B. Comply fully with all structural drawings and specifications.

### **1.03 REFERENCES**

- A. ANSI D3737-07 Structural Glued Laminated Timber.
- B. AITC 405 and ASTM D2559-00 Standards for Wood Adhesives.
- C. ANSI A190.1-2002 Structural Glued-laminated.
- D. APA Standard for Performance Related CLT- ANSI/APA PRG 320/2012.

### **1.04 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include panel location plans, dimensions, shapes and sections, openings, support conditions, connections.
  - 1. Indicate lifting connections.
  - 2. Indicate locations, tolerances, and details of anchorage to supporting structure.
  - 3. Include and locate openings larger than 10 inches.
  - 4. Indicate location of CLT panel by same identification mark placed on panel.
  - 5. Indicate relationship of CLT panels to adjacent materials.
  - 6. Clearly indicate stress grade, service grade, appearance grade.
  - 7. Provide three dimensional models of all interfaces, CLT panels, secondary timber members, plus all connections.
- C. CLT supplier to provide a fully accurate three-dimensional (3D) model of the interfaces (supports, abutments, etc.), CLT panels, secondary timber members, plus all connections prior to submission of shop drawings. Model to be generated using CADWorkv22, or approved alternate (compatible with AutoCAD 2011). 3D model to use as-built foundation X, Y, Z coordinates for CLT panel bases.

D. Structural design calculations: When required by contract drawings provide CLT structural design calculations, by a registered Professional Engineer.

E. Samples:

1. Submit 1 sample of CLT panel; approximately 12 by 12 by 3.9 inches for field applied coatings by others.

H. VOC Content: Product data and material safety data sheets (MSDS) for the CLT adhesive used on the interior of the building indicating chemical composition and VOC content.

### **1.05 QUALITY ASSURANCE**

A. Manufacturer's Qualifications:

1. Certified by APA The Engineered Wood Association for compliance with ANSI/APA PRG 320/2011 and passed all of its testing standards.

B. Design Standards:

Comply with the National Design Specification for Wood Construction NDS 2005 applicable to types of CLT panels indicated.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

A. Support units during shipment on non-staining material in same position as during storage.

B. Store units with adequate bracing and protect units to prevent contact with soil and separated with striping (so air may circulate around all faces of members), to prevent staining, and to prevent cracking, distortion, warping or other physical damage.

1. Place stored units so identification marks are clearly visible.

C. Handle and transport units in a position consistent with their shape and design in order to avoid excessive stresses that would cause cracking or damage. Protect corners with wood blocking.

D. Lift and support units only at designated points shown on Shop Drawings.

E. Slit underside of membrane covering during storage at Site. Do not deface members.

F. Cover top and sides with opaque moisture resistant membrane.

G. Maintain protection of CLT panel at all times during construction.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

A. Manufacturers: Subject to compliance with requirements, provide products as indicated on drawings by the following manufacturer; (alternates may be submitted for approval not less than 6 days before tender close).

1. Structurlam Products Ltd, 2176 Government Street, Penticton, B.C., Canada V2A 8B5  
**Dave Gardner, 250-492-8912, [dgardner@structurlam.com](mailto:dgardner@structurlam.com) (ADD 2)**

**2. Alternate manufacturers may only be provided as an alternate price to Structurlam Products Ltd. Submit alternate manufacturer's complete information and complete technical specifications of the proposed CLT panel product at the time of tender for review and consideration. (Add 7)**

### **2.02 MATERIALS**

A. Wood Species –No.1/No.2 Spruce-Pine-Fir for Cross Laminated Timber (CLT) panels.  
**Exposed faces SPF appearance grade. (PTA-1)**

B. Adhesives in compliance with ANSI A190.1, DIN 68141 and EN301 and EN302.

1. Acceptable Product: Purbond HB E452

### **2.03 ACCESSORIES**

A. Steel Connectors: Galvanized Steel.

B. Wrapping Material: Weatherproof, lightproof, stain free material. Cut holes on site and underside of wrapping to avoid accumulation of condensation.

### **2.04 FABRICATION**

A. Fabricate Cross Laminated Timber (CLT) members in accordance with ANSI/APA PRG 320/2011 except where specified otherwise and to following classifications. Use multiple layers

06 15 43-3 CROSS LAMINATED TIMBER PANELS

of 19mm minimum to 38mm maximum thick laminations.

B. Service grade: interior or exterior as located on drawings.

C. Appearance Classification:

1. Non-Visual (where panels are concealed):

a. Shake and checks allowed, shall not exceed 36" or ¼ of the length.

b. Heart or blue stain allowed, not limited.

c. Knots well-spaced, quantity not limited.

d. Minimal wane on face.

e. Side pressure on exposed face not required.

2. Visual (where panels are in view in final construction): Douglas Fir Appearance Grade on exposed faces.

- a. Utilize DF L3 Grade lumber
- b. Knots: NLGA Select Structural limitation. Select tight knot.
- c. Pitch streaks not permitted.
- d. Wane on face not permitted.
- e. Side pressure on exposed faces required.

D. Cross Laminated Timber (CLT) members to be fabricated with ¼" chamfers on long sides.

E. Cross Laminated Timber (CLT) members to be joined at panel edges using a continuous spline as indicated on drawings.

F. Mark members for identification during erection. Ensure that marks will be concealed in final assembly for appearance grade members. Clearly mark top surface.

G. Coat all cuts, holes and slots.

H. Field apply sealer to all sides of laminated members. Double coat ends of laminated members. Ref Painting Section 09 91 10 for finish coating.

I. All structural steel connecting CLT panel elements to each other and shall be detailed, and if supplied, test fitted in the shop by the CLT supplier.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION:**

A. Prior to fabrication, check all dimensions relating to this section of work. Report any discrepancies to Engineer.

B. Prior to site erection, examine all site conditions and ensure an acceptable condition.

### **3.02 INSTALLATION**

A. Erect CLT panels in accordance with final reviewed shop drawings.

B. Make adequate provision for possible erection stresses. Set panel level and plumb to correct positions. Securely brace panels and anchor in place to maintain plumb until permanently secured by finished structure.

C. Fit CLT panels closely and accurately, without trimming, cutting or other modifications, unless approved in writing by Engineer.

D. Site cutting or boring of CLT panels, other than shown on shop drawings not permitted without written consent of Engineer.

### **3.03 CLEANING**

A. Clean exposed surfaces of CLT panels after erection and completion of field touch up.

1. Perform cleaning procedures, if necessary, according to CLT manufacturer's written recommendations, Protect other work from staining or damage due to cleaning operations.
2. Do not use cleaning materials or processes that could change the appearance of exposed CLT panels or damage adjacent materials.

## **Part 4 ALTERNATES AND/OR EQUALS**

### **4.01 Base Bid**

Due to the customized detailing and engineering characteristics of the wall and/or roof and/or floor framing assembly, it is a requirement that CrossLam by Structurlam Products Ltd. be used in the base bid.

### **4.02 Alternate Manufacturers**

Other manufacturers' bids are to be listed in the alternate section of your proposal. All framing plans, detailing and calculations for the alternate bids will be reviewed by the owner, architect and engineer for structural performance, possible conflicts with related trades, and compatibility with the overall building requirements and building code.

### **4.03 Alternate Products**

Alternate products will only be permitted if written approval and acceptance is obtained by both architect and owner at least 6 days prior to the bid date.

### **4.04 Acceptable Alternates**

At the discretion of the specifier of record, accepted alternates, meeting ANSI PRG 320, will be listed on the final addendum prior to the bid date.

## **END OF SECTION**



## **SECTION 06 41 11 - ARCHITECTURAL MILLWORK**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- and
- .1 The work of this Section includes the supply, fabrication, factory finishing, delivery to the job site and installation of architectural woodwork indicated on the drawings and specified as follows:
    - .1 for base building finishes, refer to interior elevation drawings and Div 09 specifications by Architectural Consultant.
  - .2 Architectural woodwork shall include all clear, kiln dried, dressed, or resawn material exposed to view in the finished building interior and exterior, including casework, frames, paneling, trim, resurfaced/recycled wood and other wood- related products.
  - .3 Check-in counters and Holdroom gate counters
  - .4 Reception counter
  - .4 Washroom millwork
  - .3 Cabinet hardware.

#### **1.2 RELATED SECTIONS**

- .1 Section 01 73 50 Environmental Protection
- .2 Section 06 10 00 Rough Carpentry
- .3 Section 06 20 00 Finish Carpentry
- .4 Section 09 06 00 Colour Finish Schedule
- .5 Section 09 22 16 Non-structural Metal Framing
- .6 Section 09 65 00 Resilient Flooring
- .7 Section 09 68 00 Carpet Tile
- .8 Section 09 90 00 Painting and Coating
- .9 Division 22, Mechanical: Sinks in plastic laminate countertops

#### **1.3 REFERENCES**

- .1 AWS (AWMAC Architectural Woodwork Standards) – 1st Edition, 2009.
- .2 NEMA (National Electrical Manufacturers Association) LD3-2005 - High-Pressure Decorative Laminates.
- .3 ASTM E84-09c - Test Method for Surface Burning Characteristics of Building Materials.
- .4 ASTM D2832-92 – Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
- .5 BHMA A156.9-2003 - Cabinet Hardware.
- .6 CSA B111-74 – Wire Nails, Spikes, and Staples.
- .7 NPA A208.2-2009 - Medium Density Fibreboard (MDF) for Interior Applications.

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Pre-installation Meetings: Convene one (1) week before starting work of this section.

#### **1.5 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
- .3 Indicate location of all service outlets in casework, typical and special installation conditions, and all connections, attachments, anchorage and location of exposed fastenings.
- .4 Product Data: Provide data for hardware accessories.
- .5 Samples:
  - .1 Submit two (2) 300 mm x 300 mm (12 inch square) size samples, illustrating cabinet and countertop finishes.
  - .2 Submit two (2) drawer pulls, illustrating design and finish.

#### **1.6 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Provide application instructions.

#### **1.7 CLOSEOUT SUBMITTALS**

- .1 Section 01 78 10: Submission procedures.

#### **1.8 QUALITY ASSURANCE**

- .1 Perform work to AWMAC/AWS Custom quality and include for their inspection services. Where differences occur between the drawing and specification requirements, and the Manual, the more restrictive requirement shall prevail.
- .2 Where modifications to the Architectural Woodwork Standards contained within the AWS are included in this project specification, then such modifications shall govern in case of conflict. Prior to the start of Work, the Contractor shall bring to the attention of the Consultant any modifications that may void warrantee.
- .3 Any reference to Custom or Premium grade in this specification shall be as defined in the Manual.
- .4 Any item not given a specific quality grade shall be Custom grade as defined in the Manual.
- .5 A copy of the AWS shall be made readily available on site for reference purposes.
- .6 All architectural woodwork to be used in the project shall meet the requirements of the AWS.
- .7 References in this specification to part and item numbers mean those parts and items contained within the AWS.
- .8 Materials and installation shall be in Metric measurement as specified.

- .9 Millwork shall be fabricated by members in good standing of AWMAC and shall include the AWMAC inspection program.

### **1.9 MOCK-UP**

- .1 Section 01 43 00: Requirements for mock-up.
- .2 Provide mock-up of hardwood with transparent finish, full size base cabinet, portion of countertop, and upper cabinet, partial reception counter with top and which includes doors, drawer, and typical hardware accessories and fitments.
- .3 Locate where directed by Consultant.
- .4 Approved mock-up may remain as part of the Work.

### **1.10 DELIVERY, STORAGE, AND PROTECTION**

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Protect units from moisture damage as specified in AWMAC/AWS QSI Section 01700.

### **1.11 ENVIRONMENTAL REQUIREMENTS**

- .1 Section 01 35 26: Environmental conditions affecting products on site.
- .2 During and after installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

## **PART 2 - Products**

### **2.1 GENERAL**

- .1 Lumber: Use clean stock only and comply with AWS for following grades.
- .2 All fasteners used in washrooms to be suitable for use in corrosive environment. Use hot dipped galvanized or other material approved by the Architect.
- .3 All plywood to be veneer core. No MDF or particle board core is permitted on this project where plywood is indicated.
- .4 Composite wood and agrifibre products, including core materials, must contain no added formaldehyde resins. Adhesives used to fabricate laminated assemblies containing these products must contain no urea-formaldehyde.
- .5 Endangered species must not be used. Sustainable and FSC certified wood species are preferred.
- .6 Solid wood and veneer materials are acceptable: Douglas+ fir vertical grain. Confirm requirements for specific locations.
- .7 Use mechanical fasteners. Glue is not a preferred method of fastening.
- .8 Maximize recycled content for panel products.
- .9 Standard finish: clear.

## **2.2 LUMBER MATERIALS**

- .1 Lumber: To the requirements of AWMAC/AWS grade specified.
- .2 Hardwood Lumber: Species: big leaf maple, select and better, maximum moisture content of 9%; with vertical grain, of quality suitable for transparent finish.
- .3 Softwood Lumber: Species: douglas fir, plain sawn, maximum moisture content of 9%; with vertical grain, of quality suitable for opaque finish.

## **2.3 SHEET MATERIALS**

- .1 Sheet Materials: To the requirements of AWMAC/AWS grade specified.
- .2 Hardwood Plywood: formaldehyde-free, 7 ply all hardwood veneer core; Species: big leaf maple, grade to QSI manual 300-G-17 hardwood veneer face grade summary table quarter-sliced, random matched. face species, of select and better quality suitable for transparent finish.
- .3 Softwood Plywood: formaldehyde-free Veneer core; rotary cut; of quality suitable for transparent finish.
- .4 Medium Density Fibreboard for door and drawer fronts only (MDF): formaldehyde-free, NPA A208.2; composed of wood fibres, medium density, moisture resistant; of grade to suit application; sanded faces.

## **2.4 MANUFACTURERS - HIGH PRESSURE LAMINATE**

- .1 Basis of Design: Formica
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
  - .1 Wilsonart
  - .2 Nevemar
  - .3 Pionite
- .3 Substitutions: Not permitted.

## **2.5 LAMINATE MATERIALS**

- .1 High Pressure Laminate: NEMA LD3, high pressure laminate, Grade VGS and HGS; solid printed pattern colour range, with satin finish.
- .2 Laminate Backing Sheet: NEMA LD3, same thickness and colour as face laminate.
- .3 Panel Edge trim 3mm solid vinyl match pattern to face.
- .4 Laminated wood door edge trim: 3mm solid vinyl edge match pattern to face.
- .5 Cabinet Liner: NEMA LD3, Grade CLS, not less than 0.5 mm thick, white colour.
- .6 Sheet Metal: Stainless steel, 12ga Type 304 with No. 4 satin finish.
- .7 Laminate Colours
  - .1 Laminate Colour 1: FORMICA - 3842 WR Weathered Ash Woodbrush Finish
  - .2 Laminate Colour 2: 5488 NT Smoky Brown Pear

## **2.6 MANUFACTURERS - SOLID SURFACING**

- .1 Formica Solid Surfacing
- .2 Corian Solid Surfacing
- .3 Environite Countertop
- .4 Substitutions: Refer to Section 01 60 00

## **2.7 SOLID SURFACING**

- .1 Solid Surfacing: cast, nonporous, acrylic polymer, composite construction, through body colours, stain resistant to domestic chemicals and cleaners.
- .2 Colours shall be as below or equivalent price groups from other manufacturers listed above.
  - .1 Solid Surface colour 1: CORIAN - Silver Grey
  - .2 Solid Surface colour 2: CORIAN - Designer White
  - .3 Solid Surface colour 3: CORIAN - Anthracite
  - .4 Solid Surface colour 4: CORIAN - Deep Anthracite

## **2.8 ACCESSORIES**

- .1 Adhesive: Low VOC, formaldehyde free type recommended by AWMAC/AWS and laminate manufacturer to suit application.
- .2 Plastic Edge Trim (PVC): Integral colour, extruded flat shaped; smooth finish; suitable for permanent adhesive or self-locking serrated tongue; of width to match component thickness; colour as selected.
- .3 Fasteners: Size and type to suit application.
- .4 Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; <Insert Option>finish in concealed locations and <Insert Option> finish in exposed locations.
- .5 Concealed Joint Fasteners: Threaded steel.
- .6 Wiring Grommets: 75 mm diameter plastic material for cut-outs, colour as selected by Consultant.
- .7 Door and Drawer Bumpers: press-in type moulded polyethylene for 5 mm diameter hole, neutral colour. Two (2) bumpers per door up to 1200 mm in height and three (3) bumpers per door over 1200 mm, two (2) bumpers per drawer.

## **2.9 HARDWARE**

- .1 Pilaster Standards and rests: formed metal channels and rests, cut for fitted rest spaces at maximum 25 mm centres, satin finish.
- .2 Drawer and Door Pulls: Stainless steel wire D-type pulls,, 103 mm (4") centres, Finish: Satin..
  - .1 Acceptable Manufacturers:
    - a. Richelieu
    - b. Linnea
- .3 Cabinet Locks: Key all locks to Owners' requirements using keyways specified by Owner. Keyed cylinder, two (2) keys per lock, master keyed. Include for 40% of doors and drawers to have locks.
  - .1 Acceptable Materials:

- a. Doors: Schlage CL1000P8, 626 satin chromium plated finish.
- b. Drawers: Schlage CL2009P8, 626 satin chromium plated finish.
- .4 Catches: Magnetic type
- .5 Drawer Slides: Galvanized steel construction, ball bearings separating tracks, full extension, trigger disconnect, 45 kg capacity.
- .6 Hinges: self-closing, knuckle disappearing type, 105 degree, steel with satin finish. Three (3) hinges per door up to 1500 mm height and four (4) hinges for doors over 1500 mm high.

## **2.10 WOOD CASEWORK FOR TRANSPARENT FINISH**

- .1 Cabinet Construction: Flush overlay, Plywood gables, tops and end panels, to metal shelving, tops and bottoms of upper cabinets, and tops and bottoms of book case units, adjustable shelving MDF veneer core plywood.
- .2 Exposed Surfaces: veneer core, plain cut.
  - .1 Doors and Drawer Fronts: Grain direction vertical.
  - .2 Edges: Veneer edgeband, Solid lumber, as detailed for book shelves.
- .3 Semi-exposed Surfaces:
  - .1 Surfaces (other than drawer bodies): Melamine.
  - .2 Shelves: Match species and cut indicated for exposed surfaces.
  - .3 Drawer Sides and Backs: Hardwood plywood with visible edges banded.
  - .4 Drawer Bottoms: Hardwood plywood.

## **2.11 PLASTIC LAMINATE CASEWORK**

- .1 Cabinet Construction: Flush overlay MDF except adjustable shelving to be plywood core.
- .2 Exposed Surfaces:
  - .1 Drawers and Drawer Fronts: High pressure laminate.
  - .2 Edges: High pressure laminate.
- .3 Semi-exposed Surfaces:
  - .1 Surfaces (other than drawer bodies): High pressure laminate.
  - .2 Shelves: High pressure laminate
  - .3 Edges: PVC
  - .4 Drawer Sides and Backs: Edgebanded, thermofused Melamine.
  - .5 Drawer Bottoms: Edgebanded, thermofused Melamine.

## **2.12 SOLID SURFACE COUNTERTOPS**

- .1 Comply with AWMAC/AWS Quality Standards, Custom grade requirements for counter construction supplemented as follows:
- .2 Countertops, work-surfaces and washroom vanities: Solid Surfacing as directed by Consultant
- .3 Edge Treatment: Solid surface.

### **2.13 WOOD VENEER WALL PANELS**

- .1 19mm MDF with flame spread ratings compliant with BC Building Code applications
- .2 Plastic laminate veneer to all exposed surfaces
- .3 Laminate veneer to backside as required to prevent warping
- .4 3mm PVC matching panel edges
- .5 Gravity lock clip fastening system
- .6 6mm reveals at all panel interfaces
- .7 submit panel layout shop drawings.

### **2.14 STAINLESS STEEL**

- .1 Include for stainless steel cabinet bases, end panels, corners as indicated on cabinetry drawings. Submit shop drawings for all stainless steel detailing.
- .2 Include for stainless steel baseboards and corner guards as detailed on the drawings
- .3 Stainless steel shall be 12ga 410 grade, No 4 satin brush finish, bonded to plywood substrate with approved industrial adhesives.
- .4 No exposed stainless steel edges are acceptable. All edges must be turned 90 deg and terminate inside a reveal saw-cut into the substrate.
- .5 Upon completion, clean, polish out all scratches and damages and treat all stainless steel surfaces with stainless steel polish/sealer.

### **2.15 SOLID SURFACE EDGING**

- .1 Solid Surfacing:
  - .1 Colour: as directed by Consultant
  - .2 Edge Treatment: As detailed.

### **2.16 FABRICATION**

- .1 Shop prepare and identify components for matching during site assembly.
- .2 Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- .3 When necessary to cut and fit on site, provide materials with ample allowance for site cutting and scribing.
- .4 Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises and locate counter butt joints minimum 600 mm (2 ft) from sink cut-outs.
- .5 Apply wood laminate by grain matching adjacent sheets to book matching.
- .6 Apply laminate backing sheet to reverse side of plastic laminate finish.
- .7 Provide cutouts for plumbing fixtures, inserts, outlet boxes, fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal cut edges.

## **2.17 WOOD FINISHES**

- .1 Factory Finishing:
  - .1 Finishing System: AWMAC/AWS Custom grade, acrylic lacquer finish system with stain.
  - .2 Sheen: Satin.

## **2.18 FACTORY FINISHING**

- .1 Sand work smooth and set exposed nails.
- .2 Apply wood filler in exposed nail and screw indentations.
- .3 On items to receive transparent finishes, use wood filler which matches surrounding surfaces and of types recommended for applied finishes.
- .4 Seal stain and varnish exposed to view surfaces. Spray apply only.
- .5 Seal stain and varnish internal exposed to view and semi-concealed surfaces. Brush apply only.
- .6 Seal surfaces in contact with cementitious materials.

## **PART 3 - Execution**

### **3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify adequacy of backing and support framing.
- .3 Verify location and sizes of utility rough-in associated with work of this section.

### **3.2 INSTALLATION**

- .1 Install Work to AWMAC/AWS Custom Grade.
- .2 Set and secure casework in place; rigid, plumb, and level.
- .3 Use concealed joint fasteners to align and secure adjoining cabinet units and counter tops.
- .4 Carefully scribe casework abutting other components, with maximum gaps of (1 mm) 1/32 inch. Do not use additional overlay trim for this purpose.
- .5 Secure counter bases to floor using appropriate angles and anchorages.
- .6 Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- .7 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.
- .8 At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant.
- .9 Apply water resistant building paper over wood framing members in contact with masonry or cementitious construction.
- .10 Fit hardware accurately and securely in accordance with manufacturer's directions.



Caulk neatly all gaps to adjacent materials.

### **3.3      ADJUSTING**

- .1      Test installed work for rigidity and ability to support loads.
- .2      Adjust moving or operating parts to function smoothly and correctly.

### **3.4      CLEANING**

- .1      Section 01 74 00:    Cleaning installed work.
- .2      Clean casework, counters, shelves, hardware, fittings, and fixtures.

### **END OF SECTION**

## **SECTION 07 11 13 - BITUMINOUS DAMPPROOFING**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Cold applied asphalt bitumen dampproofing.
- .2 Drainage panels

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 57 13 - Construction Activity Pollution Prevention.
- .3 Section 01 74 20 - Waste Management and Disposal.
- .4 Structural Drawings – Cast-In-Place Concrete: Concrete surfaces.
- .5 Section 07 21 13 - Board Insulation: Perimeter insulation protective cover.
- .6 Section 31 23 23 - Backfilling.

#### **1.3 REFERENCES**

- .1 ASTM D41-05 - Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- .2 ASTM D449-03(2008) - Asphalt Used in Dampproofing and Waterproofing.
- .3 ASTM D449-03(2008) Asphalt used in Dampproofing and Waterproofing
- .4 CGSB-37-GP-9Ma-83 - Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
- .5 NRCA (National Roofing Contractors Association - USA) - Roofing and Waterproofing Manual.

#### **1.4 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide properties of primer, bitumen, and mastics.

#### **1.5 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements indicating special procedures and perimeter conditions requiring special attention.

#### **1.6 CLOSEOUT SUBMITTALS**

- .1 Section 01 78 10: Submission procedures.

## **1.7 QUALITY ASSURANCE**

- .1 Perform Work in accordance with NRCA Waterproofing Manual.
- .2 Applicator Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

## **1.8 ENVIRONMENTAL REQUIREMENTS**

- .1 Section 01 35 26: Environmental conditions affecting products on site.
- .2 Maintain ambient temperatures above 5 degrees C for 24 hours before and during application until membrane has cured.

## **PART 2 - Products**

### **2.1 ASPHALTIC MATERIALS**

- .1 Asphalt: CAN/CSA-A123.4 ASTM 449, Type I.
  - .1 Solvent-Based Asphalt Mastics: Cold-applied, asbestos-free, non-fibered asphalt compounds for exterior concrete surfaces above and below grade.
  - .2 Water-Based Emulsified Asphalt: Cold-applied, asbestos-free, non-fibered, emulsified-asphalt compound for exterior concrete surfaces above and below grade.
- .2 Asphalt Primer: CGSB-37-GP-9Ma, compatible with substrate.
- .3 Sealing Mastic: ASTM D4586, asbestos-free asphalt cement for trowel application.

## **PART 3 - Execution**

### **3.1 EXAMINATION**

- .1 Section 01 70 00: Verification of existing conditions before starting work.
- .2 Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.
- .3 Verify items which penetrate surfaces to receive dampproofing are securely installed.

### **3.2 PREPARATION**

- .1 Protect adjacent surfaces not designated to receive dampproofing.
- .2 Clean and prepare surfaces to receive dampproofing to manufacturer's written instructions.
- .3 Do not apply dampproofing to surfaces unacceptable to manufacturer or applicator.
- .4 Apply mastic to seal exterior joints between foundation walls and footing penetrations, small cracks, or minor honeycomb in substrate.

### **3.3 APPLICATION**

- .1 Prime surfaces in accordance with NRCA - Waterproofing Manual.
- .2 Apply bitumen in one (1) coat, continuous and uniform.

- .3 Apply from 50 mm below finish grade elevation to top of footings.
- .4 Seal items projecting through dampproofing surface with mastic. Seal watertight.
- .5 Immediately protect damproofing from sunlight until protected by drainage mat, perimeter insulation, and/or cladding.

**END OF SECTION**

## **SECTION 07 21 16 - BLANKET INSULATION**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Batt thermal insulation in exterior roofs.
- .2 Batt thermal insulation in walls

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 57 13 - Construction Activity Pollution Prevention.
- .3 Section 01 74 20 - Waste Management and Disposal.

#### **1.3 REFERENCES**

- .1 ASTM C167-09, Standard Test Methods for Thickness and Density of Blanket or Batt Thermal Insulations.
- .2 ASTM E84 -12a- Test Method for Surface Burning Characteristics of Building Materials.
- .3 CAN/ULC-S102-10 - Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .4 CAN/ULC-S702-09-AM1 - Thermal Insulation, Mineral Fibre, for Buildings.
- .5 NFPA 255-2006 - Test of Surface Burning Characteristics of Building Materials.
- .6 UL 723 - Tests for Surface Burning Characteristics of Building Materials.

#### **1.4 SYSTEM DESCRIPTION & THERMAL PERFORMANCE REQUIREMENTS**

- .1 Refer to assemblies schedules on Drawings.
- .2 Roof Thermal Performance required: R45(IP)
- .3 Wall Thermal Performance required: R35(IP)

#### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Refer to Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this section.

#### **1.6 SUBMITTALS FOR INFORMATION**

- .1 Refer to Section 01 33 00: Submission procedures.
- .2 Product Information Sheets.

## **1.7 CLOSEOUT SUBMITTALS**

- .1 Refer to Section 01 78 10: Submission procedures.

## **PART 2 - Products**

### **2.1 MANUFACTURERS**

- .1 Certain Teed Insulation Canada Inc.
- .2 Johns Manville Corporation
- .3 Owens-Corning Canada Inc.
- .4 Substitutions: Refer to Section 01 62 00

### **2.2 MATERIALS**

- .1 Fibrous Glass Insulation: Un-faced, preformed GreenGuard™ or formaldehyde free binder fibrous insulation in accordance with CAN/ULC S702 and as follows:
  - .1 Type: 1.
  - .2 Thermal values as per drawings.
  - .3 Thickness: as required to fill insulated spaces.
  - .4 Acceptable Materials:
    - .1 Johns Manville Corporation, Formaldehyde-free Fiber Glass Insulation.
    - .2 Owens-Corning Canada Inc., Ecotouch PINK Fiberglass.
    - .3 CertainTeed Insulation Canada Inc., Sustainable Insulation Fibre Glass Building Insulation
- .3 Nails Staples: Steel wire, electroplated galvanized; type and size to suit application.

## **PART 3 - Execution**

### **3.1 EXAMINATION**

- .1 Refer to Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that substrate, adjacent materials, and insulation are dry and ready to receive insulation.

### **3.2 INSTALLATION**

- .1 Install insulation to manufacturer's written instructions.
- .2 Install in exterior wall spaces without gaps or voids. Do not compress insulation.
- .3 Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- .4 Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation.
- .5 Retain in place with wire mesh secured to framing members to prevent insulation of blocking air spaces between or behind rows of frames.

## **END OF SECTION**

## **SECTION 07 26 00 - VAPOUR RETARDERS**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Sheet and sealant materials for controlling vapour diffusion.

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 57 13 - Construction Activity Pollution Prevention.
- .3 Section 01 74 20 - Waste Management and Disposal.
- .4 Section 07 21 16 - Blanket Insulation.
- .5 Section 07 27 00 - Air Barriers: Lap and sealed at wall openings.
- .6 Section 07 92 00 - Joint Sealants: Sealants.
- .7 Section 08 12 13 - Metal Doors and Frames: Door frames.
- .8 Section 08 44 13 – Glazed Aluminum Systems: Glazed systems framing

#### **1.3 REFERENCES**

- .1 ASTM E96/E96M-05 - Test Methods for Water Vapour Transmission of Materials.
- .2 CAN/CGSB-51.34-M86 - Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

#### **1.4 DEFINITION**

- .1 Vapour Retarder: A material or assembly of materials that resists water vapour diffusion through it.

#### **1.5 SYSTEM DESCRIPTION**

- .1 Materials and installation methods to provide continuity of vapour retarder:
  - .1 In conjunction with materials described in Section 07 21 13, 07 21 16, and 07 92 00.

#### **1.6 PERFORMANCE REQUIREMENTS**

- .1 Vapour Permeability (Perm): Maximum water vapour permeance of 57.4 ng/(Pa•s•m<sup>2</sup>) (1.0 perm) measured to CAN/CGSB-51.34, CAN/CGSB-51.33, or ASTM E96/E96M.

#### **1.7 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination: Coordinate with other work having a direct bearing on work of this section.

- .3 Pre-installation Meetings: Convene one (1) week before starting work of this section.
- .4 Sequencing:
  - .1 Sequence Work to permit installation of materials in conjunction with insulation and air barrier assemblies.
  - .2 Do not install vapour retarder until items penetrating it are in place.

## **1.8 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements, including preparation and installation requirements, techniques.

## **1.9 CLOSEOUT SUBMITTALS**

- .1 Section 01 78 10: Submission procedures.

## **1.10 QUALITY ASSURANCE**

- .1 Assume complete coverage, lap and perimeter sealing, and sealing to structure.

## **PART 2 - Products**

### **2.1 SHEET MATERIALS**

- .1 Underslab Retarder: CAN/CGSB-51.34, polyethylene film for below grade application, 0.25 mm thick;
- .2 Wall Retarder: CAN/CGSB-51.34, polyethylene film for above grade application, 0.15 mm thick;
- .3 Roof Retarder: CGSB-37-GP-56M, self-adhesive SBS modified bitumen. 0.8 mm thick.
  - .1 Acceptable Products and Manufacturers:
    - .1 Soprapap'r as manufactured by Soprema Inc.
    - .2 IKO MVP (Modified Vapour Protector) as manufactured by IKO Industries Inc.
- .4 Substitutions: refer to Section 01 62 00.

### **2.2 SEALANTS**

- .1 Sealant and Acoustic Sealant: Asbestos free non-hardening sealant, compatible with vapour retarder materials, recommended by vapour retarder manufacturer in accordance with Section 07 92 00.
- .2 Cleaner: Non-corrosive type; recommended by sealant manufacturer; compatible with adjacent materials.

### **2.3 ADHESIVES**

- .1 Adhesive: Compatible with sheet barrier and substrate, permanently non-curing.



## **2.4 ACCESSORIES**

- .1 Attachments: minimum 6 mm leg staples, temporary support.
- .2 Moulded Box Vapour Retarder: Factory moulded polyethylene box purpose made for use with recessed electric switch and outlet device boxes.
- .3 Electrical Vapour Barrier Box: Rigid, moulded polyethylene box with reinforced flanges.

## **PART 3 - Execution**

### **3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify condition of substrate and adjacent materials.

### **3.2 PREPARATION**

- .1 Remove loose or foreign matter which might impair adhesion.

### **3.3 INSTALLATION**

- .1 Vapour Retarder For Stud Framed Walls: Secure sheet barrier to stud faces with acoustic sealant. Lap edges over stud faces, lap ends onto adjacent construction; caulk ends with sealant to ensure complete seal.
- .2 Vapour Retarder Roofs: Roll out the membrane onto dry structural roof deck. Peel back the first metre (3 feet) of the silicone release sheet and adhere membrane in place. Hold membrane tight and peel off the remaining silicone release film diagonally. Install adjacent rolls of membrane in the same way, taking care to overlap longitudinal joints by 75 mm (3 inches). Overlap ends of the rolls 150 mm (6 inches) ensure a perfect end lap seal. Use a roller to seal the joints.
- .3 Vapour Retarder Seal For Openings: Install sheet barrier between curtain wall, window, and door frames and adjacent vapour retarder and seal with sealant. Caulk with sealant to ensure complete seal. Position laps over firm bearing.
- .4 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges or where compatibility with adjacent materials may be in doubt.
- .5 Vapour Barrier Box: Install vapour barrier boxes at electric outlet and switch locations on exterior walls. Lap and seal perimeter with sheet barrier.

## **END OF SECTION**

## **SECTION 07 27 00 - AIR BARRIERS**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Air leakage criteria for primary air seal building enclosure materials and assemblies.
- .2 Materials and installation methods supplementing other air seal materials and assemblies.
- .3 Air seal materials to connect and seal openings, joints, and junctions between other air seal materials and assemblies.

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 57 13 - Construction Activity Pollution Prevention.
- .3 Section 01 74 20 - Waste Management and Disposal.
- .4 Section 07 92 00 - Joint Sealants: Sealant materials and installation techniques.
- .5 Section 08 44 13 - Glazed Aluminum Curtain Walls: Functioning as a primary air seal.

#### **1.3 REFERENCES**

- .1 ASTM E2178-11 – Air Permeance of Building Materials.
- .2 ASTM E96/E96M-10 – Water Vapour Transmission of Materials

#### **1.4 DEFINITIONS**

- .1 Air Barrier: A continuous network of materials and joints providing air tightness, with adequate strength and stiffness to not deflect excessively under air pressure differences, to which it will be subjected in service. It can be comprised of a single material or a combination of materials to achieve the performance requirements.

#### **1.5 PERFORMANCE REQUIREMENTS**

- .1 Design Requirements: Perform design work to BCBC-2006.

#### **1.6 ADMINISTRATIVE REQUIREMENTS**

- .1 Refer to Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Coordinate the work of this section with all sections referencing this section.
- .3 Pre-installation Meetings: Convene one (1) week before starting work of this section.
- .4 Sequencing: Sequence work to permit installation of materials in conjunction with related materials and seals.

## **1.7 SUBMITTALS FOR REVIEW**

- .1 Refer to Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on material characteristics, performance criteria, limitations,<Insert Option>.

## **1.8 SUBMITTALS FOR INFORMATION**

- .1 Refer to Section 01 33 00: Submission procedures.

## **1.9 CLOSEOUT SUBMITTALS**

- .1 Refer to Section 01 78 10: Submission procedures.

## **1.10 QUALITY ASSURANCE**

- .1 Perform Work to SWRI - Sealant and Caulking Guide Specification requirements for materials installation.
- .2 Contractor Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten (10) years documented experience.
- .3 Applicator Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience.

## **1.11 MOCK-UP**

- .1 Refer to Section 01 43 00: Provide mock-up of air barrier system, which is comprised of a variety of materials.
- .2 Construct typical exterior wall panel, incorporating window and door frame and sill, insulation, junction with roof membrane air seal vapour retarder; illustrating materials interface and seals.
- .3 Locate where directed by Consultant.
- .4 Approved mock-up may remain as part of the Work.

## **1.12 ENVIRONMENTAL REQUIREMENTS**

- .1 Refer to Section 01 35 26: Environmental conditions affecting products on site.
- .2 Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

## **1.13 WARRANTY**

- .1 Refer to Section 01 78 10: Warranties.

## **PART 2 - Products**

### **2.1 SHEET MATERIALS**

- .1 Self-adhesive membrane: self-adhesive SBS rubberized asphalt bonded to sheet polyethylene, regular and high temperature and thru-wall types with nominal total thickness of (1 mm) 0.04 inch.
  - .1 Acceptable Materials:
    - a. Blueskin WP 200 as manufactured by Henry Bakor

- b. Substitutions: Refer to Section 01 62 00.
- .2 Air Barrier Sheathing Membrane:
  - .1 Acceptable Material:
    - a. Product: Tyvek Commercial Wrap as manufactured by DuPont.
    - b. Substitutions: Refer to Section 01 62 00.

## **2.2 SEALANTS**

- .1 Sealant and Acoustic Sealant: Asbestos free non-hardening sealant, compatible with vapour retarder materials, recommended by vapour retarder manufacturer in accordance with Section 07 92 00.

## **2.3 ACCESSORIES**

- .1 Primer for self-adhesive membranes:
  - .1 Acceptable Materials:
    - a. Blueskin
    - b. Aquatac
    - c. Hi-Tac Primer
    - d. As recommended by self-adhesive membrane manufacturer.
- .2 Attachments: Purpose-made galvanized steel bars and corrosion-resistant anchors.

## **PART 3 - Execution**

### **3.1 EXAMINATION**

- .1 Refer to Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that surfaces and conditions are ready to accept the Work of this section.

### **3.2 PREPARATION**

- .1 Remove loose or foreign matter which might impair adhesion of materials.
- .2 Clean and prime substrate surfaces to receive self-adhesive membrane to manufacturers written instructions.

### **3.3 INSTALLATION**

- .1 Install materials to manufacturer's written instructions.

### **3.4 FIELD QUALITY CONTROL**

- .1 Refer to Section 01 45 00: Field inspection.
- .2 Building Envelope Consultants will carry out inspection services.

### **3.5 PROTECTION OF FINISHED WORK**

- .1 Refer to Section 01 78 40: Protecting installed work.
- .2 Do not permit adjacent work to damage work of this section.

**END OF SECTION**

## **SECTION 07 42 13 – METAL WALL PANELS**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

1. This section includes machine formed metal wall panels used as the exterior or interior cladding.
  1. Air barrier
  2. Insulation
  3. Supporting sub-girts
  4. Cladding profile
  5. Accessories including associated flashings, closures and sealants.

#### **1.2 RELATED SECTIONS**

1. The drawings and provisions of the General Conditions, Supplementary Conditions and the sections included under Division 1 Specification Sections, apply to this section.

#### **1.3 REFERENCES**

- .1 CSA-S136 for the design of Cold Formed Steel Structural Members
- .2 Canadian Sheet Steel Building Institute Standards 20M.
- .3 National Building Code of Canada
- .4 RCABC Roofing Practices Manual, current edition
- .5 MACNA manual, current edition

#### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Structural performance: provide exterior/interior wall cladding assemblies capable of withstanding the effects of load and stresses from dead loads, wind loads, snow loads and normal thermal movement without evidence of permanent defects of assemblies or components.
  1. Dead load: As required by applicable building code.
  2. Live Load: As required by applicable building code.
  3. Wind Load: Wind and suction loads normal to the plane of the assembly shall be calculated in accordance with B.C. Building Code 2012 climatic information, local wind pressure, multiplied by factors and coefficients defined in the code and its supplement
  4. Thermal Movements: Provide assemblies that allow for thermal movements resulting from the following maximum changes (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components and other detrimental effects:
    - a. Temperature Change (range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
2. Joints and panel lengths shall be designed to allow free and silent movement of panels during expansion and contraction while preventing uncontrolled penetration of moisture.
3. The Aluminum building panel system, including connection hardware and all related components shall be designed to withstand local positive and negative windload pressure at a maximum L /180 under full loading.
4. Manufacturing, installation, and sealing shall prevent excessive deformation of exposed surfaces.
5. Design panel system to accommodate substructure tolerance of +0 to -1/8 inch: 10'.
6. Not Permitted: Vibration harmonics; wind whistles; noises caused by thermal movement; thermal movement transmitted to other building elements; loosening, weakening or fracturing of attachments or components of system.
7. Preformed metal panel system to withstand code imposed design loads.
8. Rainscreen performance in compliance with AAMA 508-07
9. The system shall provide clear internal paths of drainage in order to drain any trapped moisture to the exterior, discharging moisture in a manner avoiding staining of architectural finishes, collecting in puddles, formation of unsafe icicles and dripping onto pedestrians.
10. Individual panels shall be removable and replaceable when damaged.

11. Panels shall not warp or buckle when under full design loads.
12. All fastenings and connectors shall be concealed. Connection and attachment devices shall not cause staining to cladding or other adjoining materials. The anchorage system shall be designed so that the panels are secured yet "free-floating", to accommodate expansion and contraction.
13. Anchor assemblies or connection hardware, including all related connections, tracks, girts, fasteners, etc., for and related to the cladding panels shall be designed, engineered, furnished and installed as required in compliance with the specified design and performance criteria. All such items are schematic and do not necessarily indicate the exact required scope, type, shape or profile. Location and methods of anchoring panels shall be the subcontractor's responsibility, who shall design the cladding panels and connections to suit each specific condition in an acceptable manner complying with requirements specified.

#### **1.5 SUBMITTALS FOR REVIEW**

1. Refer to Section 01 33 00: Submission procedures.
2. Product Data: Manufacturer's product literature for the panel specified.
3. Shop Drawings: For exterior/interior wall panel assemblies and accessories. Include plans; elevations; sections and details.
4. Structural Calculations: Submit a comprehensive analysis of design loads, including dead loads, live loads, wind loads and thermal movement.
5. Quality Assurance Submittals: Submit the following:
  1. Certificates: Product certificates signed by manufacturer certifying materials comply with the specified performance characteristics and criteria, and physical requirements.
  2. Shop Drawings: Shop drawings sealed by a Professional Engineer registered in the province of British Columbia certifying the seismic and structural loading requirements of the panel system
6. Samples for initial selections: Manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes.
7. Samples for verification: Provide color samples of selected color. Samples shall involve normal color and texture variations, include sample sets showing the full range of variations expected.
8. Affidavit certifying that the material meets the requirements specified.
9. Submit letter of assurance of "professional design" and commitment for "field review" and compliance in accordance with specified Field Quality Control.

#### **1.6 QUALITY ASSURANCE**

1. Manufacturing, installation, and design of the panel system shall be reviewed by a professional engineer who is legally qualified to practice in the jurisdiction where the project is located and who is experienced in providing engineering services of kind indicated. Letters of Assurance and Schedule SB and SC are required
2. Manufacturer Qualifications: Minimum of 10 years of experience in manufacturing exterior wall panels similar to those specified.
3. Installer Qualifications: Acceptable to manufacturer.

#### **1.7 DELIVERY, STORAGE & HANDLING**

1. General: Comply with Division 1 Product Requirements Sections.
2. Ordering: Comply with manufacturer's ordering instructions, and lead-time requirements to avoid construction delays.
3. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
  1. Store materials in accordance with manufacturer's recommendations.
  2. Handle materials carefully to avoid damage to materials and finishes.

#### **1.8 PROJECT CONDITIONS**

1. Field Measurements: Verify actual supporting and adjoining construction by field measurements before fabrication, and indicate recorded measurements on final shop drawings. Coordinate construction to

ensure that wall panel assemblies fit properly to supporting and adjoining construction and coordinate schedule with construction progress to avoid delaying the work.

1. Established dimensions: where field measurements can not be made without delaying the work, guarantee dimensions and proceed with fabrication of wall panel assemblies corresponding to the established dimensions.

## **1.9 WARRANTY**

1. Project warranty refers to Conditions of the Contract for project warranty provisions. Manufacturer's warranty: submit, for Owner's acceptance, manufacturer's standard warranty documents executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights owner may have under Contract Documents.

2. The Contractor shall warrant the materials to be free of faults and defects in accordance with the General Conditions, except that the warranty shall be extended by paint manufacturer's standard multi-year warranty. The warranty shall be in writing and shall be signed by the manufacturer.

## **1.10 ENVIRONMENTAL REQUIREMENTS**

.1 Refer to Section 01: Environmental conditions affecting products on site.

.2 Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

## **1.11 WARRANTY**

.1 Refer to Section 01: Warranties.

## **PART 2 - PRODUCTS**

### **2.1 WALL PANEL TYPE 1**

- .1 <http://www.lkme.ca/>
- .2 100, 200, 300 mm
- .3 Closed ends.
- .4 Tri-colour ratios:
  - .1 Cambridge white 70%
  - .2 Stone Grey 20%
  - .3 Charcoal 10%

### **2.2 WALL PANEL TYPE 2**

- .1 VICWEST: AD300SR
- .2 <https://vicwest.com/products/commercial/steel-cladding/hidden-fasteners/ad-150-200-275-300/>
- .3 Zinc Grey

Parker Johnston Parker (Alberta) Ltd., 403-250-7525, trent@parkerjohnston.com  
Schlebach: Flush 1" Panel Wall / Soffit Cladding system – Wall FP100 12" profile, Soffit FPR100 Vented 8" profile; is **APPROVED** as an acceptable alternate (ADD 3)

### **2.3 WALL PANEL TYPE 3**

- .1 Alucobond/Reynobond (refer section 07 44 00)



- .2 Dry Seal Rainscreen
- .3 Charcoal Grey

## 2.4 Alternates

1. Alternate systems by other manufacturers/fabricators may be submitted to the architect not less than 7 working days prior bid.

## 2.5 MATERIALS

1. Aluminum Extrusions where required: ASTM B221, alloy 6063-T6 and/or 6061-T6
2. Sub-girts shall be fabricated from a minimum of 18ga. AZM 150 galvanized steel – sized to suit project requirements
3. Panels shall be fabricated from a minimum 22ga. PVDF coated steel
4. Flashing materials shall be fabricated from a minimum of 24ga. PVDF coated steel – color to match base wall panels
5. If required by Building Code, Metal panels shall demonstrate compliance to CAN ULC-S134 Multi-Storey Fire Evaluation that permits combustible cladding products to be used on buildings classified Non-Combustible Construction.
6. Insulation shall be Type 4 Extruded Polystyrene or Glass Faced Poly ISO in thickness required to provide R/RSI values as indicated on drawings (PTA-1)

## 2.6 FABRICATION, GENERAL

1. Composition
  1. Steel Sheet shall be brake formed in a Twin-bend Brake to reduce or eliminate differential stress in the sheet and to minimize handling. Profiles shall be as shown on drawings, and be fabricated from minimum 22ga. AZM 150 galvanized steel with a PVDF finish.  
**Note: Roll forming or press brake forming is not permitted.**
2. Aluminum face sheets
  1. Thickness .020" of 3105 H25 aluminum alloy.
3. Tolerances
  1. Panel dimensions shall be such that there will be an allowance for field adjustment and thermal movement.
  2. Panel lines, breaks and curves shall be sharp, smooth and free from unnecessary warps or buckles.
4. Panel surfaces shall be free of scratches or marks caused during fabrication.
5. Ensure that entire project is manufactured from single color coil paint run to ensure color uniformity.
6. If a metallic color is selected ensure that panel grain is maintained. Under no circumstances are panel blank sizes to be rotated even if material waste is increased.
7. Condensation: Fabricate panels for control of condensation, including vapor inclusion of seals and provisions for breathing, venting, weeping and draining.

## 2.7 ACCESSORIES

1. All exposed rivets/fasteners shall be stainless steel.
2. All hidden fasteners shall have DT2000 corrosion resistant coating or be stainless steel.
3. Flashing: Aluminum, to be finish selected from standard range where exposed; secured with concealed fastening method.
5. Panel System Subgirts: Provide AZM150 galvanized steel of minimum 18 ga. and spacing required for panel system structural requirements, as recommended by panel manufacture and in accordance with approved shop drawings. To avoid galvanic reaction, separate dissimilar metals.
6. All proprietary extrusions and flashings supplied by fabricator.
7. No exposed sealant to be used at panel-to-panel connections.

## **2.8 FINISHES, GENERAL**

1. To be PVDF or FEVE factory coil coated finish system.

## **2.9 STEEL AND ALUMINUM FINISHES**

1. Panel Finishes:

1. Coating shall be a fluoropolymer coating utilizing 70% Kynar 500 resins.
2. Color as selected by owner/consultant from manufacturer's standard colors.
3. Coating shall be factory applied on a continuous process paint line. Coating shall consist of a 0.2 mil prime coat, a 0.75 mil barrier coat, a 0.75 mil metallic/color coat containing 70% Kynar resins, and a 0.5 mil clear coat containing 70% Kynar resins (Note mil thickness is approximate.)
2. Pencil Hardness – ASTM D3363
3. Shall be HB-H minimum
4. Impact Adhesion – ASTM D2794-93
  1. Coating shall show no cracking and no loss of adhesion
5. Humidity Resistance – ASTM D2247
  1. Coating shall show no blisters after 2000 hours of 100% humidity at 95°F.
6. Salt Spray Resistance – ASTM B117
  1. After 1000 hours of exposure to 5% salt fog, at 95°F, scored sample shall show none or few #8 blisters, and less than 1/8" average creepage from scribe
7. Weatherometer Test – ASTM D882-86/G23-88 Coating shall show no cracking, peeling, blistering, or loss of adhesion after 2000 hours.
  1. Chalking Resistance – ASTM D659-86
  2. No chalking greater than #8 after 10 years Florida exposure at 45°S.
  3. Color Change – ASTM D2244-74
  4. Color change shall not exceed 5 NBS units after 10 years Florida exposure at 45°S.
8. Abrasion Resistance – ASTM D968-93

## **PART 3 - Execution**

### **3.1 EXAMINATION**

1. Refer to Section 01 70 00: Verify existing conditions before starting work.
2. Verify that surfaces and conditions are ready to accept the Work of this section.

### **3.2 PREPARATION**

1. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation. Panel substructure shall be level and plumb. Panel substructure shall be structurally sound as determined by that subcontractor's engineer. Panel substructure shall be free of defects detrimental to work and erected in accordance with established building tolerances. Coordinate delivery of such items to project site.

### **3.3 INSTALLATION**

1. Erect panels level and plumb, in proper alignment in relation to substructure framing and established lines.
2. Panels shall be erected in accordance with approved shop drawings.
3. Panel anchorage shall be structurally sound and per engineering recommendations.
4. Where aluminum materials come in contact with dissimilar materials, an isolation shim or tape shall be installed at fastening locations.
5. Locate and place wall panels' level, plumb, and at indicated alignment with adjacent work.

### **3.4 FIELD QUALITY CONTROL**

1. Refer to Section 01 45 00: Field inspection.
2. The manufacturer's or suppliers professional design engineer shall be responsible for production of shop drawings and shall provide periodic inspections during construction as required. Such inspections and

associated costs shall be included in Bid Price. At completion of the work, the manufacturer's or supplier's professional design engineer shall submit to the consultant copies of field review reports for each site visit made.

### **3.5 CLEANING AND PROTECTION**

1. Clean exposed surfaces of wall panels that are not protected by temporary covering to remove fingerprints and soil during construction period.
2. Clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
3. Protect wall panel assemblies from damage during construction. Use temporary protective coverings where needed as approved by the wall panel manufacturer.
4. Clean and touch up minor abrasions in finished with air-dried coating that matches color and gloss, and is compatible with, factory-applied finish coating.

### **END OF SECTION**

## **1. GENERAL**

### **1.1. SCOPE**

- 1.1.1. Supply and install modular aluminum building panels to the locations shown on the drawing. The work shall include all furring, galvanized mounting channels, fasteners, full aluminum cap flashings over parapets.

### **1.2. DOCUMENT**

- 1.2.1. This section of the specification forms part of the Contract Documents and is to be read, interpreted and coordinated in conjunction with all other parts.

### **1.3. REFERENCES**

- 1.3.1. ASTM E283-84, Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors.
- 1.3.2. ASTM E331-86, Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Pressure Difference.
- 1.3.3. ASTM E330, Structural Performance

### **1.4. DESIGN CRITERIA**

- 1.4.1. The design, fabrication and erection of a complete aluminum building panel system is the responsibility of this subcontractor and is based on the performance criteria specified. The system shall be a dryjoint system which shall incorporate a pressure equalized "rainscreen" system on a complete air and vapour seal, not only allowing air and vapour which enters the panel chamber to drain to the exterior of the wall, but will also allow air into the pressuring chamber to provide instantaneous pressure equalization. Vents and drain holes shall be inconspicuously located and in such positions as not to contribute to staining, streaking or marking of the panel face. Emphasis shall be placed upon the prime integrity of the critical inner air / vapour seal.
- 1.4.2. Design and install specified Aluminum building panel system and all connections to withstand earthquake forces in accordance with the requirements of The British Columbia Building Code.
- 1.4.3. The specified Aluminum building panel assembly shall be designed to accommodate the structural inter-storey drifts and other movements without breakage, dislodgment or connection failure.
- 1.4.4. Wind and suction loads normal to the plane of the assembly shall be calculated in accordance with the B.C. Building Code Climatic information, local wind pressure, multiplied by factors and coefficients defined in the code and its supplement.
- 1.4.5. The Aluminum building panel system, including connection hardware and all related components shall be designed to withstand local

- positive and negative windload pressure at a maximum  $L/180$  under full loading.
- 1.4.6. Provide for free noiseless thermal movement of components as may be caused by expected temperature ranges. Use BC Building Code Climatic Information, local temperature range 2-1/2%, without oil canning, warping, buckling failure of joint seals and air vapor seal or undue stress on anchors and fasteners. Fabrication, assembly and erection procedures shall take into account ambient temperature range at the time of the respective operation.
  - 1.4.7. Allow for movement in cladding caused by deflection in structure.
  - 1.4.8. Design wall system to allow for the unobstructed movement of air between the exterior and interior sides of metal cladding in accordance with industry accepted Rain Screen Principles.
  - 1.4.9. Ensure panel exhibits no permanent deformation when subject to design criteria specified.
  - 1.4.10. The system shall provide clear internal paths of drainage in order to drain any trapped moisture to the exterior, discharging moisture in a manner avoiding staining of architectural finishes, collecting in puddles, formation of unsafe icicles and dripping onto pedestrians.
  - 1.4.11. Fasten panel assembly to building structure in a manner which transmits all loads to the main structure without exceeding the capacity of any fastener.
  - 1.4.12. Individual panels shall be removable without disturbing adjacent panels.
  - 1.4.13. Panels shall not warp or buckle when under full design loads.
  - 1.4.14. All fastenings and connectors shall be concealed. Connection and attachment devices shall not cause staining to cladding or other adjoining materials. The anchorage system shall be designed so that the panels are secured yet "free-floating", to accommodate expansion and contraction.
  - 1.4.15. The system shall not incorporate sealant between panel joints.
  - 1.4.16. Anchor assemblies or connection hardware, including all related connections, tracks, girts, fasteners, etc., for and related to the cladding panels shall be designed, engineered, furnished and installed as required in compliance with the specified design and performance criteria. All such items are schematic and do not necessarily indicate the exact required scope, type, shape or profile. Location and methods of anchoring panels shall be the subcontractor's responsibility, who shall design the cladding panels and connections to suit each specific

condition in an acceptable manner complying with requirements specified.

- 1.4.17. Panel system shall be in compliance with the BC Building Code and other local authorities having jurisdiction.

## 1.5. SUBMITTALS

- 1.5.1. Submit shop drawing and samples in accordance with the General Requirements of this specification.
- 1.5.2. Submit shop drawings detailing construction, assembly, profiles, materials, reinforcement installation for all conditions, method of sealing and flashing, sub-framing and accessories, colours and finishes. All materials, recommendations and details describing the proposed use, design and erection procedures for all anchorage shall be documented and fully described on the shop drawings.
- 1.5.3. Engineered shop drawings shall be prepared, signed and sealed by a professional structural engineer registered in British Columbia, attesting to the ability of the Aluminum building system to withstand specified loads.
- 1.5.4. Submit letter of assurance of "professional design" and commitment for "field review" and compliance in accordance with specified Field Quality Control.
- 1.5.5. Submit letter of assurance of "professional field review" and "compliance" in accordance with specified Field Quality Control.
- 1.5.6. Submit duplicate samples of specified finish for preliminary colour section. Sample
- 1.5.7. submittal shall include (third party independent testing agency) affidavit certifying material meets requirements specified herein .
- 1.5.8. Request for substitution of other manufacturer's equivalent aluminum building panel system in lieu of the aluminum building panel system specified herein are subject to the Consultant's review and pre-approval prior to Bid Closing. Only the named Panel contractor as base bid or approved alternate in this document or by addenda will be allowed to bid this project. Provide samples, data sheets and independent testing agency certified documentation's as called for under paragraphs . This evidence must include proof of conformance and test reports as specified above. ANY EXCEPTIONS TAKEN FROM THIS SPECIFICATION MUST BE NOTED ON THE APPROVAL REQUEST. IF NO EXCEPTIONS ARE NOTED, AND APPROVAL IS GIVEN, PRODUCT PERFORMANCE WILL BE AS SPECIFIED. SHOULD NON COMPLIANCE BE SUBSEQUENTLY DISCOVERED, THE PREVIOUSLY GIVEN APPROVAL WILL BE INVALIDATED AND USE OF THE PRODUCT ON THE PROJECT WILL BE DISALLOWED. Requests for approval, with all appropriate submittal data, must be received no less than 10 days prior to bid date. A list of all approved manufacturers and products will be

issued by addendum. No other manufacturers will be acceptable. No verbal approval will be given.

- 1.5.9. Submit 600 mm x 600 mm finished sample panel representative of panel, attachments, reinforcement, construction and finish to the Consultant for approval.
- 1.5.10. Submit two (2) 300 mm x 300 mm samples of each finish selected by the Consultant.
- 1.5.11. Submit copies of aluminum building panel fabricator's current "System" "Testing" (by a third party independent testing agency) to ASTM E283-84 for air infiltration 6.24 PSF = 1.30 in.H<sub>2</sub>O to have a maximum allowable flow rate of .06 CFM/sq.ft. , ASTM E331-86 for water infiltration no uncontrolled water penetration at 12 psf for a 15 minute test duration, and ASTM E330 structural performance allowable deflection of .53" at 40psf, for proposed system, prior to bid closing.

#### 1.6. QUALITY ASSURANCE

- 1.6.1. Workers shall have a minimum of five years in panel manufacture and on site installation proven experience in this type of work and be approved by the manufacturer for installation of their products.

#### 1.7. MOCKUP

- 1.7.1. Construct a full-size mockup on site directed by the consultant. The Consultant will determine exact number of panels and appropriate location.
- 1.7.2. Mockup could be waived in lieu of representative corner sample illustrating exact system, material and attachment method.
- 1.7.3. Approved representative mockup sample panel shall serve as quality of standard and workmanship to be expected during field quality control inspections of the work being executed and at completion.

#### 1.8. PRODUCT DELIVEREY, STORAGE AND HANDLING

- 1.8.1. Deliver all materials to the site and store in original packages with manufacturer's seals and labels intact.
- 1.8.2. Observe proper handling procedures during fabrication, delivery and installation to prevent damage. Replace damaged materials, which are

stained, cracked, bent, chipped, scratched or otherwise unsuitable for installation at no additional cost to the Owner.

- 1.8.3. Store panels under cover and raised above ground to prevent damage and kept free from dampness and element extremes until required for installation.

## 1.9. ENVIRONMENTAL REQUIREMENTS

- 1.9.1. Environmental conditions for installation of materials shall be within the limits prescribed by the manufacturer of the product.

## 1.10. WARRANTY

- 1.10.1. Panels: Against oil canning or buckling due to thermal movement or building structure deflections.
- 1.10.2. Panel Finish: Against non-uniform fading during warranty period to extent that adjacent panels have a gloss and/or colour range greater than originally-accepted samples approved by the Consultant, pitting



or other type of corrosion resulting from natural elements in local atmosphere, discolouration, staining or streaking of panel surface.

- 1.10.3. Sealant: Against adhesive or cohesive failure of joints between dissimilar material, fluid, migration, dirt pickup, dirt runoff, chalking or visible colour change on surface or cured sealant.

## 1.11. MAINTENANCE

- 1.11.1. Submit manufacturer's documentation covering care, cleaning and maintenance of panels for incorporation into the Owner's operating and maintenance manuals.

## 2. PRODUCTS

### 2.1. ALUMINUM BUILDING PANELS

- 2.1.1. Acceptable Systems: Alucobond, Reynobond.

Parker Johnston Composite Panel System (PTA-1)

- 2.1.2. Thickness: 4 mm

- 2.1.3. Quantities: Size, profile, configuration, layout, and extent of aluminum building panels is as shown on the drawings.

- 2.1.4. Finishes:

- 2.1.4.1. Finish shall be Duranar XL

### 2.2. PERFORMANCE AND MATERIAL CHARACTERISTICS

- 2.2.1. Tolerances:

- 2.2.1.1. Panel Bow: Maximum 1.0% of panel dimensions on width and length.

- 2.2.2. Panel dimensions: Allowance for field adjustments as recommended by manufacturer, where final dimensions cannot be established by the field measurement before completion of panel manufacturing.

- 2.2.3. Panel lines, breaks and angles shall be sharp, true and surfaces free from warp or buckle

### 2.3. SYSTEMS

- 2.3.1. System " KPS A" as per Details

- 2.3.2. Dry Joint Rain Screen Principle:

- 2.3.3. 2.4.1.1.1 Panel joints: Extruded aluminum perimeter frame with integral weather stripping as detailed on drawings.

- 2.3.4. Gaskets: Within the panel system shall be per the manufacturer's standards.

- 2.3.5. Extrusion Finish: Shall be aluminum extrusion .

- 2.3.6. Panel Clips: As recommended by manufacturer.

2.3.7. Subgirts: Minimum 1.2mm Z275 galvanized steel as per manufacturer's requirements for panel attachment system.

2.4. SUPPORT MEMBERS, FASTENERS,  
CONNECTORS

2.4.1. Type, size quantity and spacing of all connectors, supporting track, girts, fasteners and other hardware and anchorage devices for panels as required to suit specified standards.

2.4.2. Fastening devices between aluminum or aluminum and other materials shall be aluminum or stainless steel that will not permit staining.

2.4.3. Self-locking fasteners shall be stainless steel with nylon inserts or patches.

2.4.4. Shims shall be metal to match adjacent surfaces. Do not use plastic shims.

2.5. FLASHING AND TRIM

2.5.1. Provide custom factory-fabricated integral companion flashing, trims, end caps, cap flashings and finishing components from same material as the aluminum building panels.

2.5.2. Finish: Shall be of [matching] [contrasting] colour with the Aluminum building panels.

2.5.3. Flashing and Trims: Prefinished 24 GA to match panel colour.

2.5.4. Colour: match with aluminum building panels.

2.6. SEALANT

2.6.1. Silicone sealant recommended by panel supplier for this application.

2.7. FABRICATION

2.7.1. Machine fabricated all material in accordance with reviewed shop drawings with straight lines, square corners or smooth bends, free from twists, kinks, warps, dents, and other imperfections which may affect appearance or serviceability.

2.7.2. Provide reinforced panels as required to meet the tolerances specified above.

2.7.3. System shall have a flush appearance from the exterior with no reveal other than module joint width.

2.7.4. Panels shall be aligned with no lap or reveal other than joint width to permit expansion and contraction.

2.7.5. Thickness of the metal and details of assembly and support shall provide sufficient strength and stiffness to resist distortion of finish surface. Exposed edges and ends of metal shall be dressed smooth, free from sharp edges and with no uniform minimum radius corners.

Connections and joints exposed to weather shall be constructed to exclude water.

2.7.6. Fasteners shall be concealed.

2.7.7. Back of panels shall be sealed to framing with continuous bead of silicone sealant.

2.7.8. All necessary holes shall be drilled and clip attachments applied before application of finish.

2.7.9. Trim and flashing shall be factory-fabricated ready for assembly.

2.7.10. Design and fabricate appropriate type, size, quantity and spacing of all sub-connectors, girts, fasteners and other anchorage devices as required to suit the specified standards.

2.7.11. Subgirts shall be perforated at regular intervals to permit drainage of cavity.

## 2.8. FINISH

2.8.1. All exposed Aluminum wall panels shall be based on approved sample panel.

## 3. EXCUTION

### 3.1. INSPECTION

3.1.1. Inspect the work of the others upon which the work of this section depends and report in writing to the Consultant any defects which would impair the performance of the work.

### 3.2. ERECTION

3.2.1. All erection work is the responsibility of the installation team and be carried out by manufacturer's trained erection crew in accordance with reviewed shop drawings, manufacturer's specifications and compliance with the Contract Documents.

3.2.2. Erect panels plumb, true and level and in correct alignment with established lines and elevation shown on reviewed shop drawings.

3.2.3. Set all panels in locations shown on the details and shall be level, square and plumb with correct elevations and in alignment with other work.

3.2.4. Install all girts, clips, anchors, and flashing securely to surrounding construction spaced to afford maximum rigidity.

3.2.5. Provide all hole for mechanical and electrical services, piping, louvers, etc., penetrating panels. Provide watertight flanges, flashings, reinforcing and sealant around all penetrations exposed to the weather and or as shown on the drawings.

3.2.6. Joints shall not be less than their dimensioned width or more than five percent (5%) greater than their dimensioned width at any location

along their full length and shall not be wavy, out of line or of different width panel to panel.

- 3.2.7. Installed panels shall not deviate from overall plane or alignment more than 1.5mm in 900mm. Adjacent panels shall not deviate from plane and alignment by more than 0.79mm along their length.

### 3.3. SEALANTS

- 3.3.1. Install sealant to penetrations through panels and at junctions with dissimilar materials.

### 3.4. FIELD QUALITY CONTROL

- 3.4.1. The manufacturer's or suppliers professional design engineer shall be responsible for production of shop drawings and shall provide periodic inspections during construction as required. Such inspections and associated costs shall be included in Bid Price.
- 3.4.2. At completion of the work, the manufacturer's or supplier's professional design engineer shall submit to the consultant copies of field review reports for each site visit made and a final signed and sealed letter of assurance of "professional field review" and "compliance" indicating that all aluminum building panels have been installed in accordance with the manufacturer's specifications, the standards specified herein and the final reviewed shop drawings.

### 3.5. CLEANING

- 3.5.1. Remove manufacturer's protective film at appropriate time in advance of the date of substantial performance of the Project. Review concurrently to ensure there is no damage or marring to the wall panels. Replace damaged or marred panels accordingly to the approval of the Consultant.
- 3.5.2. Wash panels to remove surface dust, dirt, stains and marks on the panels caused by ambient environmental weather conditions and construction activities. Provide a clean installation of the work in accordance with section 01001
- 3.5.3. Use cleaners approved by the manufacturers of surfaces to be cleaned.
- 3.5.4. Protect panels from damage by other trades.
- 3.5.5. Remove tools, debris, equipment, and surplus materials from the site.

End of Section

## **1.1 SECTION INCLUDES**

- .1 Latex modified concrete facing, bonded to rigid polystyrene foam insulation backing, for exterior application to low rise, and perimeter foundation walls, with related flashings and accessory components.
- .2 Above and below grade locations: Suitable air/vapour barriers site specific, as required over structural walls.

## **1.2 RELATED SECTIONS**

- .1 Section 07 26 00 - Vapour Retarders.
- .2 Section 07 27 00 - Air Barriers.
- .3 Section 07 62 00 - Sheet Metal Flashing And Trim.
- .4 Section 07 84 00 - Firestopping.

## **1.3 REFERENCES**

- .1 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701, Standard for Thermal Insulations, Polystyrene, Boards and Pipe Covering.
  - .2 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .2 American Society for Testing and Materials International(ASTM)
  - .1 ASTM A123/A123M, Zinc (Hot Dip Galvanized) Coatings on Iron or Steel Products.
  - .2 ASTM C518, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
  - .3 ASTM D1621, Standard Test Method for Compressive Properties Of Rigid Cellular Plastics.
  - .4 ASTM D2842, Standard Test Method for Water Absorption of Rigid Cellular Plastics.
  - .5 ASTM E96, Standard Test Methods for Water Vapor Transmission of Materials.
  - .6 ASTM D696, Standard Test Method for Determining Coefficient of Linear Thermal Expansion of Plastics between -30C and +30C.
  - .7 ASTM C203,Standard Test Method for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.
  - .8 ASTM D2126, Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
- .3 Canadian Standards Association

- .1 CSA S478-95 (R2007) – Guideline on Durability in Buildings.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Visit [www.tech-crete.com](http://www.tech-crete.com) for a current copy of the Material Safety Data Sheet (MSDS)
- .5 Canadian Construction Materials Centre (CCMC) Evaluation Listing, published by the Institute for Research in Construction (IRC) of the National Research Center Canada (NRC/CNRC):
  - .1 Evaluation Listing CCMC 04888-L for STYROFOAM™ Tech-Crete Blanks

#### **1.4 SYSTEM DESCRIPTION**

- .1 Assembly of components includes purpose supplied, preformed panel mounting clips capable of securing factory bonded concrete faced insulated wall panels to structural supporting wall framing.
- .2 Comply with requirements for continuity of building air barriers, vapour retarders plus wind and suction loads as identified in the BC Building Code and applicable local requirements.

#### **1.5 PERFORMANCE REQUIREMENTS**

- .1 Wall assembly: Design components to withstand flexing and physical distortion due to dead and live loads caused by positive and negative wind pressure acting normal to plane of wall cladding surfaces.
- .2 Maximum Allowable Deflection of Wall Assembly: Determined by supporting structure and imposed weather loads.
- .3 Movement: Accommodate thermal and wind loads within wall assembly without damage to components or deterioration of seals, movement within assembly and between components, when subject to seasonal temperature cycling; dynamic loading and release of loads; deflection of structural support framing.
- .4 Maximum Allowable Deflection of Wall Assembly: 1/280 of span.
- .5 Drainage: Provide positive drainage to water and condensate collectors within wall assembly.
- .6 Products: Provide continuity of thermal barrier at building enclosure elements in conjunction with other thermal insulating materials.
- .7 Vapour Retarder: Provide continuity of vapour retarder at building enclosure elements in conjunction with vapour retarders specified in Section 07 26 00.
- .8 Air Seal: Provide continuity of air barrier seal at building enclosure elements in conjunction with air seal materials specified in Section 07 27 00.

- .9 Vapour Retarder: Provide continuity of vapour retarder at building enclosure elements in conjunction with vapour retarders specified in Section 07 26 00.

## **1.6 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination
  - .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Coordinate the Work for installation of vapour retarder and air barrier seals.
  - .3 Coordinate the Work with installation of windows, louvres, and components or materials

## **1.7 SUBMITTALS FOR REVIEW**

- .1 Submission procedures as specified in Section 01 33 00.
- .2 Shop Drawings: Indicate dimensions, layout, construction and expansion joints, construction details, methods of anchorage.
- .3 Samples: Submit two (2) samples of full size wall siding, 200 x 200 mm (8 x 8 inch) in size illustrating manner of fitment devices with adjacent panels, with specified finishes and surface texture.

## **1.8 SUBMITTALS FOR INFORMATION**

- .1 Submission procedures as specified in Section 01 33 00.
- .2 Installation Data: Manufacturer's special installation requirements.

## **1.9 QUALITY ASSURANCE**

- .1 Installer Qualifications: Company specializing in performing the work of this section with training and experience.
- .2 Product Identification: Each pallet of insulated roof panels shall be labelled with product name; manufacturers name or trademark; insulation conforming to ULC S701 Type 4; number of panels per pallet; insulation thickness, and thermal resistance per unit of thickness.
- .3 Insulation must conform to CCMC – Evaluation Listing #04888-L, for NBC compliance.

**1.10        MOCK-UP**

- .1        Requirements for mock-up as specified in Section 01 45 00.
- .2        Provide 1.2m long by 1.2m wide mock-up, which includes structural supports for siding components, panels, attachments to building frame, associated vapour retarder and air seal materials, weep drainage system, sealants and seals, and related insulation.
- .3        Locate where directed by Consultant.
- .4        Approved mock-up may remain as part of the Work.

**1.11        DELIVERY, STORAGE, AND PROTECTION**

- .1        Transport, handle, store, and protect delivered products as specified in Section 01 61 00.
- .2        Store concrete faced insulated wall panels under cover, and in original packaging until ready to install. Store opened packages under cover until installed. Schedule installation to minimize open package time
- .3        Store prefinished material off ground protected from weather, to prevent twisting, bending, or abrasion, and to provide ventilation.
- .4        Prevent contact with materials which may cause electrolysis, discolouration or staining.

**1.12        WARRANTY**

- .1        Provide warranties as specified in Section 01 78 00: Closeout Procedures.
- .2        Provide manufacturers five (5) year limited warranty to include panel replacement for delamination of concrete facing.

**Part 2       Products**

**2.1        MANUFACTURERS**

- .1        Tech-Crete Processors Ltd., CFI®Wall Panel, in modular sections, website: [www.tech-crete.com](http://www.tech-crete.com), Telephone: 250-832-9705



## **2.2 WALL PANEL ATTACHMENT**

- .1 Galvanized Steel: ASTM A123/A123M-08 - Zinc-Coated (Galvanized), Z275 to G90 coating designation, preformed as supplied by manufacturer, complete with corrosion proof masonry fasteners.

## **2.3 INSULATION**

- .1 STYROFOAM™ Tech-Crete Blanks by DOW Chemical, extruded polystyrene, conforming to code requirements, in accordance with CAN/ULC S701 type 4.
- .2 Thermal resistance: RSI 0.87/25mm to ASTM C518.
- .3 Foam Compressive Strength: 240 kPa (35 PSI) in accordance with ASTM D1621.
- .4 Water Absorption: ASTM D2842: <0.7 % by volume.
- .5 Water Vapour Permeance: 0.8 perms in accordance with ASTM E96.
- .6 Insulation Thickness: inches 102 mm.

## **2.4 CONCRETE FACED INSULATED WALL PANELS**

- .1 Concrete: Latex modified concrete mix, 8 mm (5/16") thick, with control joint score at mid-length.
- .2 Edge Treatment: Tongue and groove along longitudinal foam edges, butt joints on lateral edges.
- .3 Surface Finish: Textured Broom finish; Grey colour, may be coated.

## **2.5 ACCESSORIES**

- .1 Gaskets to Adjacent Substrates: Standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant; colour to match adjacent colour.
- .2 Sealants to Adjacent Substrates: Standard type suitable for use with installation of system; non-staining, non-skinning, non-shrinking and non-sagging; ultraviolet and ozone resistant; colour as selected.
- .3 Clips and Fasteners: Manufacturer's standard type to suit application; as supplied.
- .4 Field Repair and Touch-up: As recommended by panel manufacturer.
- .5 Building Paper Over Surface of Supporting Wall Structure: Commercial grade Tyvek.
- .6 Perimeter Insulation Flashings 24 gauge minimum: Coordinate supply of end closures and flashings for perimeter insulation system with Section 07 62 00.

## **2.6 COMPONENTS**

- .1 Exterior concrete faced insulated wall panel sizes as indicated on drawings:
  - .1 Width: as indicated on drawings.
  - .2 Length: as indicated on drawings.
  - .3 Thickness: 100 mm
- .2 Internal and External Corners:
  - .1 Manufacturers installation guidelines provide corner details (see CFI Installation at [www.tech-crete.com](http://www.tech-crete.com)). Diagrams are also provided in each fastener package.
  - .2 Metal profiles to suit assembly, brake formed to required profiles
  - .3 Trim, Closure Pieces, Caps, Flashings, Facias, Soffits and Infills: Brake formed to required profiles.

## **2.7 FABRICATION**

- .1 Form sections true to shape, accurate in size, square, and free from distortion or defects.
- .2 Form custom pieces in longest practicable lengths.
- .3 Fabricate corners in one continuous piece.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verify existing conditions and substrates before starting work as specified in Section 01 71 00.
- .2 Verify that building framing members are ready to receive panel assembly.
- .3 Remove substrate surface irregularities before installing wall panels. Sweep and clear debris clear of surfaces to receive panels.
- .4 Ensure existing water proofing below grade is cured and dry.
- .5 If the lowest substrate surface is not level to receive panels, create a level surface with a galvanized steel ledger angle, and secure level.

### **3.2 INSTALLATION**

- .1 Install damproofing / waterproofing on walls to receive concrete faced insulated wall panels.
- .2 Weather lap barriers, stagger vertical joints of each course. Repair incidental tears.

- .3 Seal securely to achieve air and moisture tightness.
- .4 Ensure snug fit between panel tongue and grooves, and lateral butt joints.
- .5 Fasten concrete faced insulated panels to structural supports; aligned level and plumb.
- .6 Install panels with vertical joints and panel control joints in alignment.
- .7 Use manufacturer's fasteners. Maintain neat appearance.
- .8 Cover exposed insulation at corners and top of perimeter insulation with prefinished flashing as specified in Section 07 62 00.
- .9 Where concrete flatwork or asphalt is to be laid adjacent to CFI Wall Panels, an isolation joint should be provided to protect the CFI mortar surface from differential movement

### **3.3 CLEANING**

- .1 Clean installed work as specified in Section 01 74 11 - Cleaning.
- .2 Remove and collect site cuttings, foam bits and packaging for re-cycling.

## **SECTION 07 54 19 - THERMOPLASTIC MEMBRANE ROOFING**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Vapour barrier.
- .2 Roof insulation.
- .3 Deck Overlay.
- .4 Roofing membrane system.
- .5 Installation of metal roof flashings, fasteners, accessories and trims.
- .6 Walkway Protection.

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 57 13 - Construction Activity Pollution Prevention.
- .3 Section - Demolition
- .4 Section 01 74 20 - Waste Management and Disposal.
- .5 Section 06 10 00 - Wood Framing: Wood sheathing
- .6 Section 07 62 00 - Sheet Metal Flashing and Trim: Weather protection for base flashings.
- .7 Section 07 27 00 – Air Barriers: Perimeter Strip Membrane
- .8 Division 22 – Plumbing: Roof drains, sumps, and hoppers.
- .9 Division 23 – Heating, Ventilating, and Air-Conditioning (HVAC): Prefabricated curb for mechanical equipment.

#### **1.3 REFERENCES**

- .1 ASTM D6878 - Standard Specification for Thermoplastic Polyolefin based Sheet
- .2 ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- .3 ASTM D41/D41M-11 - Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- .4 ASTM D 312 - Standard Specification for Asphalt Used in Roofing.
- .5 CAN/CGSB-37-GP-56M-1985- Membrane Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
- .6 CAN/ULC-S107-10 - Methods of Fire Tests of Roof Coverings.
- .7 CAN/ULC-S704-11 - Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Fixed.
- .8 ASTM D 2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
- .9 ASTM D 4869 - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep
- .10 ASTM D 6878 - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing

## **1.4 STANDARDS**

- .1 Province of British Columbia Roofing Contractors Association – Roofing Practices Manual including advisory bulletins.
- .2 ULC (Underwriters Laboratories of Canada) - List of Equipment and Materials for:
  - .1 Building Materials.
  - .2 Fire Resistance.

## **1.5 SYSTEM DESCRIPTION**

- .1 Sarnafil S327 RhinoBond System.

## **1.6 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Coordinate the work with the installation of associated metal flashings, as the work of this section proceeds.
- .3 Pre-installation Meetings:
  - .1 Convene one (1) week before starting work of this section.
  - .2 Review preparation and installation procedures and coordinating and scheduling required with related work.

## **1.7 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide product data for membrane, flashing materials, insulation vapour retarder.
- .3 Samples: Submit one (1) sample of cap sheet with solar reflective index of not less than 70.

## **1.8 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 When manufacturer's written instructions for specific installation requirements are referenced in Part 3 Execution, include the following request for submittal of those instructions. Edit the Part 3 statements to avoid conflict with manufacturer's written instructions.
- .3 Samples of each primary component to be used in the roof system and the manufacturer's current literature for each component.
- .4 Written approval by the insulation manufacturer (as applicable) for use and performance of the product in the proposed system.
- .5 Sample copy of Sika Sarnafil's warranty.
- .6 Sample copy of Applicator's warranty.
- .7 Dimensioned shop drawings which shall include:
  - .1 Outline of roof with roof size and elevations shown.

- .2 Details of flashing methods for penetrations.
- .3 Technical acceptance from Sika Sarnafil.
- .8 Certifications by manufacturers of roofing and insulating materials that all materials supplied comply with all requirements of the identified ASTM and other industry standards or practices.
- .9 Certification from the Applicator that the system specified meets all identified code and insurance requirements as required by the Specification.
- .10 Material Safety Data Sheets (MSDS)

## **1.9 CLOSEOUT SUBMITTALS**

- .1 Section 01 78 10: Submission procedures.

## **1.10 QUALITY ASSURANCE**

- .1 Perform Work to RCABC/RGC practice Manual and manufacturers written instructions.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten (10) years documented experience.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience and approved by the manufacturer.
- .4 Use only materials listed by RCABC/RGC.

## **1.11 REGULATORY REQUIREMENTS**

- .1 Conform to applicable code for roof assembly fire hazard requirements.
- .2 CAN/ULC-S107: Class A, B, or C Fire Hazard Classification.

## **1.12 DELIVERY, STORAGE, AND HANDLING**

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Deliver products in manufacturer's original containers, dry, undamaged, seals and labels intact.
- .3 Store products in weather protected environment, clear of ground and moisture.
- .4 Stand roll materials on end.

## **1.13 ENVIRONMENTAL REQUIREMENTS**

- .1 Section 01 35 26: Environmental conditions affecting products on site.
- .2 Do not apply roofing membrane during inclement weather ambient temperatures above or below manufacturers or RCABC/RGC recommendations.
- .3 Do not apply roofing membrane to damp or frozen deck surface.
- .4 Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- .5 Provide cut-offs at the end of each workday to prevent ingress of moisture into the roof insulation.

#### **1.14 WARRANTY**

- .1 This article extends the warranty period beyond the one (1) year contract warranty period. Extended warranties add to construction cost and may present difficulties to the Owner by enforcing them. Specify with caution.
- .2 Refer to Section 01 78 10: Warranties.
- .3 This roofing system shall be applied only by a Roofing Applicator authorized by Sika Sarnafil prior to bid (Sika Sarnafil "Applicator") and a Member in Good Standing of the Roofing Contractors Association of British Columbia
- .4 Upon completion of the installation and the delivery to Sika Sarnafil by the Applicator of certification that all work has been done in strict accordance with the contract specifications and Sika Sarnafil's requirements, a Sika Sarnafil Technical Service Representative will review the installed roof system wherever a Standard or System warranty has been specified.
- .5 There shall be no deviation made from the Project Specification or the approved shop drawings without prior written approval by the Owner, the Architect and Sika Sarnafil. Use the following paragraph when a provincial roofing association warranty is available. Not all provincial associations use the term "Certificate of Assurance"; edit accordingly. Use the second paragraph if there is no provincial roofing association warranty requirement.
- .6 All work pertaining to the installation of Sarnafil membrane and flashings shall only be completed by Applicator personnel trained and authorized by Sika Sarnafil in those procedures.
- .7 Manufacturer's warranties generally apply to sheet materials and systems. Include the following paragraph when a manufacturer's warranty is required. Consult manufacturer for available terms.
- .8 Manufacturer's Warranty: Provide a minimum twenty-five (25) year manufacturer's warranty to include coverage for failure to meet specified requirements.

#### **1.15 APPLICATOR/ROOFING CONTRACTOR WARRANTY**

- .1 Applicator shall supply Owner with a separate workmanship warranty. In the event any work related to roofing, flashing, or metal is found to be within Applicator **10 Year** warranty term, defective or otherwise not in accordance with Contract Documents, the Applicator shall repair that defect at no cost to the Owner. Applicator's warranty obligation shall run directly to the Owner, and a copy shall be sent to Sika Sarnafil.

#### **1.16 OWNER RESPONSIBILITY**

- .1 Owner shall notify both Sika Sarnafil and the Applicator of any leaks as they occur during the time period when both warranties are in effect.

#### **1.17 WARRANTY DURATIONS**

- .1 Sika Sarnafil's warranty shall be in effect for a 25 year duration.
- .2 Applicator's/Roofing Contractor's Warranty shall be in effect for a 10 year duration.

#### **1.18 QUALITY ASSURANCE**

- .1 This roofing system shall be applied only by a Roofing Applicator authorized by Sika Sarnafil prior to bid (Sika Sarnafil "Applicator") and a Member in Good Standing of the Roofing Contractors Association of British Columbia
- .2 Upon completion of the installation and the delivery to Sika Sarnafil by the Applicator of certification that all work has been done in strict accordance with the contract specifications and Sika Sarnafil's requirements, a Sika Sarnafil Technical Service Representative will review the installed roof system wherever a Standard or System warranty has

been specified.

.3 There shall be no deviation made from the Project Specification or the approved shop drawings without prior written approval by the Owner, the Architect and Sika Sarnafil.

.4 All work pertaining to the installation of Sarnafil membrane and flashings shall only be completed by Applicator personnel trained and authorized by Sika Sarnafil in those procedures.

.5 At the discretion of the Owner, the Owner shall appoint and pay for a 3rd party inspector to inspect the work of this section.

#### **1.19 CODE REQUIREMENTS**

.1 The Applicator shall submit evidence that the proposed roof system meets the requirements of the local building code and has been tested and approved or listed by the following test organizations. These requirements are minimum standards and no roofing work shall commence without written documentation of the system's compliance, as required in the "Submittals" section of this specification.

.2 System shall be designed to meet a minimum wind design requirements of the most recent version of ASCE 7.

.3 Factory Mutual Research Corporation (FM) - Norwood, MA

.1 Class 1-90 (for high wind exposure)

.4 Underwriters Laboratories, Inc. - Northbrook, IL

.1 Class A assembly

#### **1.20 PRODUCT DELIVERY, STORAGE AND HANDLING**

.1 All products delivered to the job site shall be in the original unopened containers or wrappings bearing all seals and approvals.

.2 Handle all materials to prevent damage. Place all materials on pallets and fully protect from moisture.

.3 Membrane rolls shall be stored lying down on pallets and fully protected from the weather with clean canvas tarpaulins. Unvented polyethylene tarpaulins are not accepted due to the accumulation of moisture beneath the tarpaulin in certain weather conditions that may affect the ease of membrane weldability.

.4 As a general rule all adhesives shall be stored at temperatures between 40 degree F (5 degree C) and 80 degree F (27 degree C). Read instructions contained on adhesive canister for specific storage instructions.

.5 All flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow precautions outlined on containers or supplied by material manufacturer/supplier.

.6 All materials which are determined to be damaged by the Architect or Sika Sarnafil are to be removed from the job site and replaced at no cost to the Owner.

#### **1.21 JOB CONDITIONS**

.1 Sarnafil materials may be installed under certain adverse weather conditions but only after consultation with Sika Sarnafil, as installation time and system integrity may be affected.



- .2 Only as much of the new roofing as can be made weather-tight each day, including all flashing and detail work, shall be installed. All seams shall be heat welded before leaving the job site that day.
- .3 All work shall be scheduled and executed without exposing the interior building areas to the effects of inclement weather.
- .4 All surfaces to receive new membrane or flashings shall be dry. Should surface moisture occur, the Applicator shall provide the necessary equipment to dry the surface prior to application.
- .5 All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.
- .6 Uninterrupted water-stops shall be installed at the end of each day's work and shall be completely removed before proceeding with the next day's work. Water-stops shall not emit dangerous or unsafe fumes and shall not remain in contact with the finished roof as the installation progresses. Contaminated membrane shall be replaced at no cost to the Owner.
- .7 The Applicator is cautioned that certain Sarnafil membranes are incompatible with asphalt, coal tar, heavy oils, roofing cements, creosote and some preservative materials. Such materials shall not remain in contact with Sarnafil membranes. The Applicator shall consult Sika Sarnafil regarding compatibility, precautions and recommendations.
- .8 Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, the Applicator and General Contractor in Concert shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas. A substantial protection layer consisting of plywood over Sarnafelt or plywood over insulation board shall be provided for all new and existing roof areas that receive rooftop traffic during construction.
- .9 Prior to and during application, all dirt, debris and dust shall be removed from surfaces either by vacuuming, sweeping, blowing with compressed air or similar methods.
- .10 The Applicator shall follow all safety regulations as required by Worksafe BC and any other applicable authority having jurisdiction.
- .11 All new roofing waste material (i.e., scrap roof membrane, empty cans of adhesive) shall be immediately removed from the site by the Applicator and properly transported to a legal dumping area authorized to receive such material.
- .12 The Applicator shall take precautions that storage and application of materials and equipment does not overload the roof deck or building structure.
- .13 Flammable adhesives and deck primers shall not be stored and not be used in the vicinity of open flames, sparks and excessive heat.
- .14 Protective wear shall be worn when using solvents or adhesives or as required by job conditions.

## **PART 2 - Products**

### **2.1 MANUFACTURERS - MEMBRANE MATERIALS**

- .1 Basis of Acceptance: Sarnafil S327 RhinoBond System
  - .1 All Components of the Sarnafil Adhered roof system are to be products of Sika Sarnafil as indicated on the Detail Drawings and specified in the Contract Documents.
  - .2 Carlisle SureFlex PVC Rhino Bond; is **APPROVED** as an acceptable alternate (ADD 3)
- .2 Substitutions: Refer to Section 01 62 00.

## **2.2 MEMBRANE MATERIAL**

- .1 Sarnafil S327 thermoplastic membrane with polyester reinforcement and lacquer coating.  
**SureFlex KEE HP membrane; is **APPROVED** as an acceptable alternate (ADD 3)**
- .2 Membrane shall conform to:  
ASTM D4434 (latest version), "Standard for Polyvinyl Chloride Sheet Roofing". Classification: Type II, Grade I.
  - .1 ASTM D4434 (latest version), "Standard for Polyvinyl Chloride Sheet Roofing". Classification: Type III.
  - .2 NSF/ANSI Standard 347, "Sustainability Assessment for Single Ply Roofing Membranes". Certification Level: Platinum.
  - .3 The manufacture to guarantee that the membrane thickness meets or exceeds [the specified thickness] when tested according to ASTM D751.
- .3 Thickness
  - .1 Sarnafil S327-15, **72 mil (1.8mm)**
- .4 Color of Membrane
  - .1 EnergySmart Light Gray, initial solar reflectance of 0.51, emittance of 0.84, and solar reflective index (SRI) of 58 (ENERGY STAR listed).

## **2.3 FLASHING MATERIALS**

- .1 Wall/Curb Flashing
  - .1 Sarnafil G410-15 60 mil (1.5 mm) Membrane
    - .1 A fiberglass reinforced membrane adhered to approved substrate using Sarnacol adhesive. Include lacquer coating. Consult Product Data Sheets for adhesive options and additional information.
    - .2 Colour: To be selected by the architect  
**SureFlex and SureFlex PVC coated metal flash; is **APPROVED** as an acceptable alternate (Add 3)**
  - .2 Sarnaclad
    - .1 A PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. Sarnaclad is a 24 gauge, G90 galvanized metal sheet with a 20 mil (0.5 mm) unsupported Sarnafil membrane laminated on one side.
    - .2 Colour: To be selected by the architect  
**SureFlex and SureFlex PVC coated metal flash; is **APPROVED** as an acceptable alternate (Add 3)**
- .2 Perimeter Edge Flashing
  - .1 Sarnaclad

.1 A PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. Sarnaclad is a 24 gauge, G90 galvanized metal sheet with a 20 mil (0.5 mm) unsupported Sarnafil membrane laminated on one side.

.2 Colour: To be selected by the architect

SureFlex and SureFlex PVC coated metal flash; is **APPROVED** as an acceptable alternate (Add 3)

.3 Sarnastack

.1 A prefabricated vent pipe flashing made from 0.048 inch (48 mil/1.2 mm) thick Sarnafil G410 membrane. Available in five different sizes. IMPORTANT NOTE: Plumbing Stack Flashings will be provided by the Roofing Contractor. Provide for 2 vent stacks and re-use one existing gooseneck.

SureFlex and SureFlex PVC coated metal flash; is **APPROVED** as an acceptable alternate (Add 3)

.4 Sarnacorners - Universal

.1 Prefabricated outside and inside flashing corners made of 0.060 inch (60 mil/1.5 mm) thick membrane that are heat-welded to membrane or Sarnaclad base flashings. Available in one size which accommodate both inside and outside corners. Can be cut into one inside or one outside corner.

SureFlex and SureFlex PVC coated metal flash; is **APPROVED** as an acceptable alternate (Add 3)

## 2.4 ADHESIVES AND SEALANTS

Carlisle recommended adhesives and sealants; is **APPROVED** as an acceptable alternate (Add 3)

.1 Sikaflex-1a Sealant

.1 A proprietary sealant used at flashing terminations. Consult Product Data Sheet for additional information.

.2 Sarnacol 2170 Adhesive

.1 A solvent-based reactivating adhesive used to attach membrane to flashing substrate. Consult Product Data Sheets for additional information.

.3 Sarnacol 2170 VC Adhesive

.1 A solvent-based, low VOC, reactivating adhesive used to attach membrane to flashing substrate. Consult Product Data Sheets for additional information.

## 2.5 VAPOR BARRIER PRIMER

Carlisle recommended primers; is **APPROVED** as an acceptable alternate (Add 3)

.1 Sarnavap Self-Adhered Primer

A solvent-based primer designed for use with Sarnavap Self-Adhered vapor barrier to prime wood, concrete, lightweight concrete, gypsum boards and decks prior to application of Sarnavap Self-Adhered vapor barrier. Consult Product Data Sheet for additional information.

## 2.6 VAPOR BARRIER (SELF ADHERED)

VapAir Seal 725TR Air/Vapour barrier; is **APPROVED** as an acceptable alternate (Add 3)

.1 Sarnavap Self Adhered

A 32 mil (0.8 mm) self-adhesive vapor barrier that can also serve as temporary roof protection. Sarnavap Self-Adhered is available in rolls 44.9 inches x 133.8 feet (1.14 x 40.8 m). Consult Product Data Sheet for additional information.

**2.7 ROOF INSULATION**

SecurShield POLYISO insulation; is **APPROVED** as an acceptable alternate (Add 3)

.1 Sarnatherm flat and Tapered Insulation

A 20 or 25 psi rigid polyisocyanurate insulation board with a coated polymer bonded glass fiber mat facer. A glass mat facer CANNOT be used with hot-applied systems. Available in 4 x 4 ft (1.2 x 1.2 m) or 4 x 8 ft (1.2 x 2.4 m) flat or tapered sizes in various thicknesses. Consult Product Data Sheet for additional information. Minimum Slope and Thickness as indicated on drawings

**2.8 INSULATION ADHESIVE**

Carlisle recommended adhesives; is **APPROVED** as an acceptable alternate (Add 3)

.1 Sarnafil OM Bond Adhesive

A low odor, VOC compliant, one step foamable polyurethane adhesive used to attach insulation to approved compatible substrates. Adhesive is applied by combining two 5 gallon box sets placed on a cart and dispensed through a combining hose or by hand with a dual component caulk gun. Additional adhesive may be required for rougher surfaces. Consult Product Data Sheets for additional information and for approved substrates and approved insulations. Required for use at all areas of new insulation and between insulation and Densdeck Prime.

**2.9 DECK OVERLAYMENT/INSULATION OVERLAYMENT**

USG SECUROCK Glass-Mat Roof Board; is **APPROVED** as an acceptable alternate (Add 3)

.1 DensDeck Prime

.1 A fire-tested, gypsum hardboard with glass-mat facers and a pre-primed surface on one side. DensDeck Prime is to be provided in a 4 x 8 ft (1.2 x 2.4 m) board size and in thicknesses of 1/2" or 5/8" as indicated.

**2.10 ADHESIVES AND SEALANTS**

Carlisle recommended adhesives and sealants; is **APPROVED** as an acceptable alternate (Add 3)

.1 Sarnacol 2170 Adhesive:

.1 Use a water-filled, foam-covered lawn roller to consistently and evenly press the membrane into the adhesive layer.

.2 Sarnacol 2170 VC Adhesive:

.1 A solvent-based, low VOC, reactivating adhesive used to attach the membrane to the substrate, either horizontally or vertically.

.3 Sarnaplate-Preassembled

- .1 Combination of a 3 inch round plate and a #15 fastener used to attach insulation boards to steel or wood roof decks.
- .4 Sarnafastener #15
  - .1 A #15 corrosion-resistant fastener used with Sarnaplates to attach insulation boards to steel or wood roof decks.
- .5 Sarnastop
  - .1 An extruded aluminum, low profile bar used with certain Sarnafasteners to attach to the roof deck or to walls/curbs at terminations, penetrations and at incline changes of the substrate.

## **2.11 WALKWAY PROTECTION**

Carlisle recommended walkway protection; is **APPROVED** as an acceptable alternate (Add 3)

- .1 Sarnatred -V
  - .1 A polyester reinforced, 0.096 inch (96 mil/2.4 mm), weldable membrane with surface embossment. Used as a protection layer from rooftop traffic where detailed.

## **2.13 ATTACHMENT COMPONENTS**

Carlisle recommended attachment components; is **APPROVED** as an acceptable alternate (Add 3)

- .1 Sarnadisc RhinoBond

A high strength plate with a polymer coating used with various Sarnafasteners to attach insulation boards to the roof deck and as a substrate to induction weld S327 membrane, Sarnadisc RhinoBond is a 3 inch (75 mm) round, 22 gauge corrosion resistant steel plate. Consult Product Data Sheet for additional information.
- .2 Sarnafastener - XP

A #15, heavy-duty, corrosion-resistant fastener used to attach to steel or 1/2-3/4 inch wood roof decks, Sarnafastener-XP has a shank diameter of approximately 0.21 inch (5.3 mm) and the thread diameter is approximately 0.26 inch (6.6 mm). The driving head has a diameter of approximately 0.435 inch (11 mm) with a #3 Phillips recess for positive engagement. Consult Product Data Sheet for additional information.
- .3 Sarnafastener – MAX LOAD

A #21, extra heavy-duty, corrosion-resistant fastener used various roof decks, Sarnafastener-MAXLoad has a shank diameter of approximately 0.26 inch (6.6 mm) and a thread diameter of approximately 0.33 inch (8.4 mm). The driving head has a diameter of approximately 0.66 inch (16.8 mm) with a #3 Phillips recess for positive engagement. Consult Product Data Sheet for additional information.

## **2.14 RELATED MATERIALS**

- .1 Wood Nailer

Treated wood nailers shall be installed into the structural purlins at the perimeter of the entire roof and around such other roof projections and penetrations as specified on Project Drawings. Thickness of nailers must match the insulation thickness to achieve a smooth transition. Wood nailers shall be treated for fire and rot resistance (wolmanized or osmose treated) and be #2 quality or better lumber. Creosote or asphalt-treated wood is not acceptable. Wood nailers shall conform to Factory Mutual Loss Prevention Data Sheet 1-49. All

wood shall have a maximum moisture content of 19 percent by weight on a dry-weight basis.

.2 Plywood

When bonding directly to plywood, a minimum 1/2 inch (12 mm) CDX (C side out), smooth-surfaced exterior grade plywood with exterior grade glue shall be used. Rough-surfaced plywood or high fastener heads will require the use of Sarnafelt behind the flashing membrane. Plywood shall have a maximum moisture content of 19 percent by weight on a dry weight basis.

## **2.15 MISCELLANEOUS FASTENERS AND ANCHORS**

- .1 All fasteners, anchors, nails, straps, bars, etc. shall be post-galvanized steel, aluminum or stainless steel. Mixing metal types and methods of contact shall be assembled in such a manner as to avoid galvanic corrosion. Fasteners for attachment of metal to masonry shall be expansion type fasteners with stainless steel pins. All concrete fasteners and anchors shall have a minimum embedment of 1-1/4 inch (32 mm) and shall be approved for such use by the fastener manufacturer. All miscellaneous wood fasteners and anchors used for flashings shall have a minimum embedment of 1 inch (25 mm) and shall be approved for such use by the fastener manufacturer.

## **2.16 MISCELLANEOUS ACCESSORIES**

.1 Sarnamatic 641mc or 661

- .1 220 volt, self-propelled, hot-air welding machine used to seal Sarnafil membrane seams.

.2 RhinoBond Induction Welder

- .1 A 110 volt induction welding device that creates a radio frequency that allows the membrane to be welded to a specially coated plate.

.3 Aluminum Tape

- .1 A 2 inch (50 mm) wide pressure-sensitive aluminum tape used as a separation layer between small areas of asphalt contamination and the membrane and as a bond-breaker under the coverstrip at Sarnaclad joints.

.4 Multi-Purpose Tape

- .1 A high performance sealant tape used with metal flashings as a preventive measure against air and wind blown moisture entry.

.5 Perimeter Warning Tape

- .1 Designed for use on PVC membranes as a reflective, highly visible pressure sensitive tape used to draw attention to roof perimeters and potential hazardous areas. The tape is available in 2 inch wide rolls by 30 feet long and comes on a release liner for easy application. Perimeter Warning Tape exceeds reflectivity 3 requirements and Federal spec. L-S-300, Class 1.

.6 Perimeter Warning Membrane

- .1 The Perimeter Warning Membrane is made from Sarnafil G410 membrane, Yellow in color, and is 4" (101mm) wide and 100' (30m) long.

.7 Seam Cleaner

- .1 Seam Cleaner is used on PVC membranes to clean the in the seam area only.

### **PART 3 - Execution**

#### **3.1 PRE-CONSTRUCTION CONFERENCE**

- .1 The Applicator, Architect and Manufacturer(s) shall attend a pre-construction conference.
- .2 The meeting shall discuss all aspects of the project including but not limited to:
  - .1 Safety
  - .2 Set up
  - .3 Construction schedule
  - .4 Contract conditions
  - .5 Coordination of the work

#### **3.2 SUBSTRATE CONDITION**

- .1 Applicator shall be responsible for acceptance or provision of proper substrate to receive new roofing materials. Demolition of existing metal roofing as detailed in *Section 00 10 00 - Demolition*
- .2 Applicator shall verify that the work done under related sections meets the following conditions:
- .3 Roof drains and scuppers have been reconditioned or replaced and installed properly.
- .4 Roof curbs, nailers, equipment supports, vents and other roof penetrations are properly secured and prepared to receive new roofing materials.
- .5 All surfaces are smooth and free of dirt, debris and incompatible materials.
- .6 All roof surfaces shall be free of water, ice and snow.

#### **3.3 SUBSTRATE PREPARATION**

- .1 The roof deck and existing roof construction must be structurally sound to provide support for the new roof system. The Applicator shall load materials on the rooftop in such a manner as to eliminate risk of deck overload due to concentrated weight. The General Contractor's Representative shall ensure that the roof deck is secured to the structural framing according to local building code and in such a manner as to resist all anticipated wind loads in that location.

#### **3.4 SUBSTRATE INSPECTION**

- .1 A dry, clean and smooth substrate shall be prepared to receive the Sarnafil Adhered roof system.
- .2 The Applicator shall inspect the substrate for defects such as excessive surface roughness, contamination, structural inadequacy, or any other condition that will adversely affect the quality of work.
- .3 The substrate shall be clean, smooth, dry, free of flaws, sharp edges, loose and foreign material, oil and grease. Roofing shall not start until all defects have been corrected.
- .4 All roof surfaces shall be free of water, ice and snow.
- .5 Sarnafil shall be applied over compatible and accepted substrates only.

#### **3.5 VAPOR BARRIER ADHESIVE INSTALLATION (NEW ADDITION AREA)**

- .1 Shake well before using. Apply to clean and dry surfaces with a paint brush, roller or sprayer. Application rates will vary depending on substrate. Sarnavap Self-Adhered vapor barrier must be installed on the same day as the primer application. Drying time is typically 30 minutes to 3 hours.

### **3.5 VAPOR BARRIER INSTALLATION (NEW ADDITION AREA)**

- .1 Install Sarnavap Self-Adhered over a clean and dry substrate. In concrete deck applications concrete must be fully dry. Do not install when it is raining, snowing, or on wet/humid surfaces. Install in temperatures 14 degree F (-10 degree C) and above. The use of a primer is required on the following substrates: wood, concrete, lightweight concrete, gypsum boards and decks. On metal decks use a metal plate (6 x 42 inches - 15 x 106 cm) to support the membrane end lap between metal flutes ensuring a complete end lap seal.
- .2 Begin application at the bottom of the slope. Unroll Sarnavap Self-Adhered onto the substrate without adhering for alignment. Overlap each preceding sheet by 3 inches (75 mm) lengthwise following the reference line and by 6 inches (150 mm) at each end. Stagger end laps by at least 12 inches (300 mm). Do not immediately remove the silicone release sheet.
- .3 Once aligned, peel back a portion of the silicone release sheet and press the membrane onto the substrate for initial adherence. Hold Sarnavap Self-Adhered tight and peel back the release sheet by pulling diagonally.
- .4 Use a minimum 100 lb (45 kg) steel, membrane roller, by rolling in two directions to press Sarnavap Self-Adhered down into the substrate including the laps. Finish by aligning the edge of the roller with the lower end of the side laps and rolling up the membrane. Do not cut the membrane to remove air bubbles trapped under the laps. Squeeze out air bubbles by pushing the roller to the edge of the laps.

### **3.6 INSULATION APPLICATION (NEW ADDITION AREA)**

- .1 Sarnacol OM Board Adhesive
  - .1 All work surfaces should be clean, dry, free of dirt, dust, debris, oils and other contaminants that may result in a surface that is not sound or is uneven.
  - .2 Apply the Sarnacol OM Board Adhesive directly to the substrate, using a ribbon pattern. Space the 1 in. (25 mm) wide wet beads at a maximum of 12 in. (30 cm) o.c. to achieve proper coverage rate. Actual ribbon spacing will depend on the wind uplift rating required. Allow the adhesive to turn to a pink color (normally 10-15 minutes) before placing the insulation or roof board into the adhesive. The adhesive is designed to provide approximately 7-10 minutes of open time during a typical summer day. CAUTION: Walking insulation boards in immediately after placement into adhesive may cause slippage/movement until adhesive starts to set up. On roof slopes greater than 1/2 inch (13 mm) in 12 inches (305 mm), begin adhering insulation at low point and work upward to avoid slippage. One person should be designated to walk in, trim/slit and apply weight to all insulation boards to ensure adequate securement. Only areas that can be made completely watertight in the same day's operations shall be coated.

Consult Product Data sheet for additional information on approved substrates, approved insulation or roof boards, and additional installation guidelines.

### **3.7 DECK OVERLAY INSTALLATION**

- .1 Adhesive Attachment (New Addition Area)
  - .1 All work surfaces should be clean, dry, free of dirt, dust, debris, oils and other contaminants that may



result in a surface that is not sound or is uneven.

- .2 Apply the Sarnacol OM Board Adhesive directly to the substrate, using a ribbon pattern. Space the 1 in. (25 mm) wide wet beads at a maximum of 12 in. (30 cm) o.c. to achieve proper coverage rate. Actual ribbon spacing will depend on the wind uplift rating required. Allow the adhesive to turn to a pink color (normally 10-15 minutes) before placing the insulation or roof board into the adhesive. The adhesive is designed to provide approximately 7-10 minutes of open time during a typical summer day. **CAUTION:** Walking insulation boards in immediately after placement into adhesive may cause slippage/movement until adhesive starts to set up. On roof slopes greater than 1/2 inch (13 mm) in 12 inches (305 mm), begin adhering insulation at low point and work upward to avoid slippage. One person should be designated to walk in, trim/slit and apply weight to all insulation boards to ensure adequate securement. Only areas that can be made completely watertight in the same day's operations shall be coated.

Consult Product Data sheet for additional information on approved substrates, approved insulation or roof boards, and additional installation guidelines.

### **3.8 APPROVED OVERLAY BOARDS:**

- .1 DensDeck Prime Roof Boards

### **3.9 APPROVED SUBSTRATE/DECK TYPE:**

- .1 Structural Roof Decking: Concrete, Gypsum, Cementitious Wood Fiber (Tectum), Wood or Steel.

### **3.10 INSTALLATION OF SARNAFIL MEMBRANE**

- .1 The surface of the insulation or substrate shall be inspected prior to installation of the Sarnafil roof membrane. The substrate shall be clean, dry, free from debris and smooth with no surface roughness or contamination. Broken, delaminated, wet or damaged insulation boards shall be removed and replaced. Sarnafil S327 membrane shall be attached with Sarnafasteners and Sarnadisc RhinoBond according to Sika Corporation's and wind uplift requirements per ASCE 7 or Factory Mutual.
- .2 RhinoBond - Membrane Attachment to Structural Deck (Documented Pullout Tests Required)
  - .1 General
    - .a Sarnafil S327 full width rolls shall be placed over the installed boards. Membrane overlaps shall be shingled with the flow of water where possible. Seam overlaps may be placed over Sarnadisc RhinoBond plate. Welding of the plate will not be affected.
    - .b Tack welding of the membrane for purposes of temporary restraint during installation is not permitted and may result in voiding of Sika Corporation warranty. Consult Sika Corporation's Technical Department for further information.
  - .2 Field, Perimeter and Corner Areas

Over the properly prepared, installed and attached substrate surface following either the 2 by 2 foot (0.6 by 0.6 m) or 2 by 3 foot (0.6 by 0.9 m) grid pattern, S327 full-width rolls are to be installed so as to properly shed water. See Detail Drawings for fastener layouts. Refer to FM LPDS 1-29 for their

requirements for perimeter and corner enhancements.

1. Securement Around Rooftop Penetrations

.a Around all perimeters, at the base of walls, drains, curbs, vent pipes, or any other roof penetrations, Sarnafasteners and Sarnadisc RhinoBond, Sarnadiscs or Sarnabars shall be installed according to perimeter rate of attachment. Fasteners shall be installed according to the manufacturer's instructions. Fasteners shall be installed using the fastener manufacturer's recommended torque-sensitive fastening tools with depth locators. If Sarnadisc RhinoBond is not used, the fasteners shall clamp the Sarnafil membrane tightly to the substrate.

.b Sarnafil membrane flashings shall extend 2-1/2 inches (63 mm) past Sarnadisc and be hot-air welded to the Sarnafil deck membrane.

**3.11 INSTALLATION OF SARNAFIL MEMBRANE**

.1 General

.1 Welding equipment shall be provided by or approved by Sika Corporation. All mechanics intending to use the equipment shall have successfully completed a training course provided by a Sika Corporation Technical Service Representative prior to welding.

.2 All membrane to be welded shall be clean and dry.

.2 Induction Welding

.1 Activate the weld between membrane and plate using approved portable induction device. The induction coil must be positioned over the center of the Sarnadisc RhinoBond, +/- 1 inch (25 mm) Portable induction device must elevate the temperature of the Sarnadisc RhinoBond from ambient to 400 – 500 degree F (204 – 260 degree C). Cycle time will be affected by available power, use a heavy gauge power cord, at a minimum 12 gauge by 100 feet.

.2 When the induction welding cycle is complete, immediately place a Cool & Clamp magnetic weight on the welded assembly. This device must be left in place for at least 60 seconds.

.3 Quality Control of Induction Welding

.1 The Applicator shall check all induction welds each day. Check welds by using an ordinary plunger centered over the welded plate and pull straight up. Correct welds shall have no separation between the plate and membrane.

**3.12 HOT-AIR WELDING OF SEAM OVERLAPS**

.1 General

.1 All seams shall be hot-air welded. Seam overlaps should be 3 inches (76 mm) wide for the RhinoBond System and 4 inches (100 mm) wide when hand-welding, except for certain details.

.2 Welding equipment shall be provided by or approved by Sika Corporation. All mechanics intending to use the equipment shall have successfully completed a

training course provided by a Sika Corporation Technical Service Representative prior to welding.

.3 All membrane to be welded shall be clean and dry.

.2 Hand-Welding

.1 Hand-welded seams shall be completed in two stages. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.

.2 The back edge of the seam shall be welded with a narrow but continuous weld to prevent loss of hot air during the final welding.

.3 The nozzle shall be inserted into the seam at a 45 degree angle to the edge of the membrane. Once the proper welding temperature has been reached and the membrane begins to "flow", the hand roller is positioned perpendicular to the nozzle and rolled lightly. For straight seams, the 1-1/2 inch (40 mm) wide nozzle is recommended for use. For corners and compound connections, the 3/4 inch (20 mm) wide nozzle shall be used.

.3 Machine Welding

.1 Machine welded seams are achieved by the use of Sika Sarnafil's automatic welding equipment. When using this equipment, Sika Sarnafil's instructions shall be followed and local codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable generator is recommended. No other equipment shall be operated simultaneously off the generator.

.2 Metal tracks may be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles.

.4 Quality Control of Welded Seams

.1 The Applicator shall check all welded seams for continuity using a rounded screwdriver. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark gray material from the underside of the top membrane. On-site evaluation of welded seams shall be made daily by the Applicator at locations as directed by the Architect, Roof Inspector or Sika Sarnafil's representative. One inch (25 mm) wide cross-section samples of welded seams shall be taken at least three times a day. Correct welds display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Applicator at no extra cost to the Owner.

### **3.13 MEMBRANE FLASHINGS**

.1 All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Architect and Sika Sarnafil. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Applicator's expense. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces. Use caution to ensure adhesive fumes are not drawn into the building.

### **3.14 SARNACOL ADHESIVE FOR MEMBRANE FLASHINGS**

- .1 Over the properly installed and prepared flashing substrate, Sarnacol adhesive shall be applied according to instructions found on the Product Data Sheet. The Sarnacol adhesive shall be applied in smooth, even coats with no gaps, globs or similar inconsistencies. Only an area which can be completely covered in the same day's operations shall be flashed. The bonded sheet shall be pressed firmly in place with a hand roller.
- .2 No adhesive shall be applied in seam areas that are to be welded. All panels of membrane shall be applied in the same manner, overlapping the edges of the panels as required by welding techniques.
- .3 All flashings shall extend a minimum of 8 inches (0.2 m) above roofing level unless otherwise accepted in writing by the Architect and Sika Sarnafil Technical Department.
- .4 All flashing membranes shall be consistently adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place.
- .5 All flashing membranes shall be mechanically fastened along the counter-flashed top edge with Sarnastop at 6 to 8 inches (0.15 to 0.20 m) on center.
- .6 Sarnafil flashings shall be terminated according to Sika Sarnafil recommended details.
- .7 All flashings that exceed 30 inches (0.75 m) in height shall receive additional securement. Consult Sika Sarnafil Technical Department for securement methods.

### **3.15 SARNASTOP/SARNABAR**

- .1 Install Sarnastop/Sarnabar/Sarnacord according to the Detail Drawings with approved fasteners into the structural deck at the base of parapets, walls and curbs. Sarnastop is required by Sika Sarnafil at the base of all tapered edge strips and at transitions, peaks, and valleys according to Sika Sarnafil's details.
- .2 Sika Sarnafil's requirements and recommendations and the specifications shall be followed. All material submittals shall have been accepted by Sika Sarnafil prior to installation.

### **3.17 METAL FLASHINGS**

- .1 Metal details, fabrication practices and installation methods shall conform to the applicable requirements of the following:
  - .1Factory Mutual Loss Prevention Data Sheet 1-49 (latest issue).
  - .2Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) – latest issue.
  - .3Roofing Contractors Association of British Columbia – Roofing Practices Manual – latest issue
- .2 Complete all metal work in conjunction with roofing and flashings so that a watertight condition exists daily.
- .3 Metal shall be installed to provide adequate resistance to bending to allow for normal thermal expansion and contraction.
- .4 Metal joints shall be watertight.
- .5 Metal flashings shall be securely fastened into solid wood blocking. Fasteners shall penetrate the wood nailer a minimum of 1 inch (25 mm).

- .6 Airtight and continuous metal hook strips are required behind metal fascias. Hook strips are to be fastened 12 inches (0.3 m) on center into the wood nailer or masonry wall.
- .7 Counter flashings shall overlap base flashings at least 4 inches (100 mm).
- .8 Hook strips shall extend past wood nailers over wall surfaces by 1-1/2 inch (38 mm) minimum and shall be securely sealed from air entry.

### **3.18 WALKWAY INSTALLATION**

- .1 Sarnatred-V Walkway
  - .1 Roofing membrane to receive Sarnatred-V Walkway shall be clean and dry. Place chalk lines on deck sheet to indicate location of Walkway. Apply a continuous coat of Sarnacol 2170 or 2170 VC adhesive to the deck sheet and the back of Walkway in accordance with Sika Sarnafil's technical requirements and press Walkway into place with a water-filled, foam-covered lawn roller. Clean the deck membrane in areas to be welded. Hot-air weld the entire perimeter of the Walkway to the Sarnafil deck sheet. Check all welds with a rounded screwdriver. Re-weld any inconsistencies. **Important:** Check all existing deck membrane seams that are to be covered by Walkway with rounded screwdriver and reweld any inconsistencies before Walkway installation. Do not run Walkway over Sarnabars.

### **3.19 COMPLETION**

- .1 Prior to demobilization from the site, the work shall be reviewed by the Architect, The Roof inspector, and the Applicator. All defects noted and non-compliances with the Specifications or the recommendations of Sika Sarnafil shall be itemized in a deficiency list. These items must be corrected immediately by the Applicator to the satisfaction of the Architect and Sika Sarnafil prior to demobilization.

All Warranties referenced in this Specification shall have been submitted and have been accepted at time of contract award.

### **END OF SECTION**

## **PART 1 – GENERAL**

### **1.1 DESCRIPTION**

- .1 General Requirements  
Division 1, General Requirements, is part of this specification and shall apply as if repeated here
- .2 Work furnished and included:
  - .1 Insulation
  - .2 Roofing Board
  - .3 Peel and Stick membrane
  - .4 Roof panel clip system.
  - .5 Roof panel.
  - .6 Accessories including ALL associated flashings, closures, sealants.
- .3 Related work not included:
  - .1 Solid substrate support for Metal Roofing System.
  - .2 Mechanical equipment and/or ductwork as well as their supporting framing.
  - .3 Flashings associated with other trades.

### **1.2 STANDARDS**

- .1 Design of cladding system in accordance to the latest edition of:
  - .1 CSA-S136 for the design of Cold Formed Steel Structural Members
  - .2 Canadian Sheet Steel Building Institute Standards 10M and 20M.
  - .3 National Building Code of Canada

### **1.3 QUALITY ASSURANCE**

- .1 Manufacturer of roof system, and installer shall demonstrate at least five years experience in projects similar in scope.
- .2 This section establishes the standard of quality required for the complete metal roof system. Proposed substitutions must meet this standard, and will be considered as follows:
  - .1 A written request for approval of a substitution is received at least ten (10) days prior to tender closing.
  - .2 The request includes a complete item-by-item description comparing the proposed substitution to the specified system, together with manufacturer's literature, samples, test data, engineering standards and performance evaluation indicating comparable standards to those specified.

### **1.4 DESIGN REQUIREMENTS**

- .1 Design roof system to resist
  - .1 Snow loads and snow build-up and rain load, expected in this geographical region NBCC climatic data, 50 year probability
  - .2 {Wind loads, positive and negative, expected in this geographical region NBCC climatic data, 50 year probability} {### kPa}
  - .3 Dead load of roof system.
  - .4 If the roof system is to be designed as a shear diaphragm, then the factored shear design loads "Q" and the flexibility factors "F" must be shown on the structural drawings.
- .2 Deflection of the roof system is not to exceed 1/240<sup>th</sup> of the span for the specified live loading.
- .3 Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, overstressing of components, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.

- .1 Temperature Change (Range): 20 deg C, ambient; 40 deg C, material surfaces

## **1.5 SAMPLES**

- .1 Submit samples of standard coloured metal roof sheet for review by the consultant, prior to fabrication.

## **1.6 SHOP DRAWINGS**

- .1 Submit shop drawings in accordance with Section 01
  - .1 Indicate arrangement of pre-finished Roof Sheet, including joints, types and locations of supports, fasteners, flashing, gutters, mitres, and all metal components related to the roof installation. Include for insulation underlayment and membrane as part of the roof system.
  - .2 Drawings shall be signed and sealed by a Professional Engineer, attesting to the ability of the metal panels assembly to withstand the specified loads.

## **1.7 MAINTENANCE DATA**

- .1 Provide maintenance data for cleaning and maintenance of panel finishes for incorporation into manual specified in Section 01

## **1.8 PRODUCT DELIVERY, HANDLING AND STORAGE**

- .1 Store components and materials in accordance with panel manufacturer's recommendations and protect from elements.
- .2 Protect prefinished steel during fabrication, transportation, site storage and erection, in accordance with CSSBI Standards.

## **1.9 GUARANTEE**

- .1 For work in this section, warranty by installer against defects or deficiencies in materials or workmanship shall be for a period of one year from date of substantial completion.

## **1.10 WARRANTY**

- .1 Provide a manufacturer's written warranty: Furnish panel manufacturer's written warranty covering failure of factory-applied exterior finish within the warranty period. Warranty period for finish: 40 years after the date of Substantial Completion. The values below are based on normal environments and exclude any aggressive atmospheric conditions.
  - .1 {WeatherX™ (Siliconized Polyester - SMP) will not crack, chip, or peel (lose adhesion) for forty (40) years from date of installation (40.5 yrs from application). This does not include minute fracturing that may occur during the normal fabrication process. WeatherX™ (Siliconized Polyester - SMP) will not chalk in excess of a number six (6) rating, in accordance with ASTM D-4214-98 method D659 at any time for thirty (30) years from date of installation (30.5 yrs from application); will not change colour more than eight (8.0) Hunter ΔE units as determined by ASTM method D-2244-02.}

## **PART 2 – PRODUCTS**

### **2.1 ROOF SYSTEM COMPONENTS:**

- .1 Roof System: Tradition100-4 on Solid Substrate by Vicwest. (or equal alternate submitted for approval to consultant at least 7 days before bid close date)

Parker Johnston Parker (Alberta) Ltd., 403-250-7525, trent@parkerjohnston.com  
Schlebach: 1.5" Mechanically locked Standing Seam roof system – ML150; is **APPROVED**  
as an acceptable alternate. (Add 3)

- .1 **Insulation:** Poly Iso rigid foam roof insulation 175 mm thick, mechanically fastened to I-90 wind uplift standards
- .2 **Roofing Board:** 12.5mm T&G plywood roofing board mechanically fastened to I-90 wind uplift standards
- .3 **Underlayment:** Membrane shall be peel and stick Lastobond Shield HT by Soprema. or an approved type to meet equal performance.
- .4 **Clip System:**
  - .1 Thermally responsive clips to be fabricated from a minimum of 0.91 mm (.036") steel, with minimum Z275 galvanized coating designed to accommodate expansion and contraction of the roof sheet.
  - .2 Roof Fasteners: As specified by manufacturer, to resist wind uplift and sliding snow forces.
- .5 **Prefinished Roof Sheet**, exposed to exterior.
  - .1 Profile: Tradition 100-4, with I-style ribs at 400 mm spacing.
  - .2 Panel: Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a nominal core thickness 0.76mm (0.030").

ML150 with Double Seamed ribs at 16"; is **APPROVED** as an acceptable alternate

- .6 **Snap Cap**
  - .1 Provide 25 mm high snap caps for full length of the roof panel and retained by panel clips, fabricated from Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a minimum nominal core thickness 0.61mm (0.024"). Finish and colour to match roof sheet.

## 2.2 PANEL FINISHES:

- .1 Coating: Prepainted with WeatherX™ on interior face (Silicone Modified Polyester (SMP) paint system)

## 2.3 COLOUR

- .1 Colour to be "Zinc-Grey"; Barrier coating thickness shall be 8 mils on exterior exposed surface of the finished profile and 6 mils on the reverse. selected from the manufacturer's standard colour range.

## 2.4 ACCESSORIES

- .1 Flashing: In accordance with Section [07 62 00]. Formed from same materials as the roof sheet. Custom fabricated to suit architectural details, as required.
- .2 Closures: Foam and metal closures to suit profiles selected, to manufacturer's recommendations.
- .3 Sealants: In accordance with manufacturer's recommendation and Section [07 92 00].



## **2.5 FABRICATION**

- .1 Fabricate roof components to comply with dimensions, profiles, gauges and details as shown on the shop drawings, including fascia and soffit panels and all companion flashing.
- .2 Fabricate all components of the system in the factory, ready for field installation.
- .3 Provide roof sheet and all accessories in longest practicable length to minimize field lapping of joints.

## **PART 3 — EXECUTION**

### **3.1 EXAMINATION**

- .1 Examine work of other Sections upon which work of this Section depends.
- .2 Report all discrepancies to consultant before beginning work on the roof system.

### **3.2 INSTALLATION**

- .1 Roof Materials:
  - .1 Underlayment: Install underlayment fully adhered to solid substrate according to manufacturer's recommendations. Ensure all joints are properly lapped and sealed. Tie in with barriers on adjacent surfaces to ensure airtight construction. Provide a continuous seal around all openings in the insulated metal roof system. Provide continuous membrane extending to create concealed gutter.
  - .2 Clip: Attach Tradition clips using fasteners as recommended by the manufacturer, to suit the substrate.
- .2 Roof Panel Installation
  - .1 Install exterior prefinished roof panels on panel support clips, using manufacturer's proper construction procedure. Ensure metal roofing sheet side-lap is positively retained by clips, and proper sheet coverage is maintained.
  - .2 Install the snap-cap at all side laps as shown on the approved shop drawings. Mitre snap-cap as required to resist water entry.
  - .3 Where indicated on approved shop drawings, secure the end-lap of metal roofing sheets in accordance with the manufacturers specifications and details to provide a weather-tight seal. Exposed fasteners to match colour of the roof sheet.
  - .4 Provide notched and formed closures, sealed against weather penetration, at changes in pitch, and at ridges and eaves, where required.
  - .5 Install all companion flashing {gutters}, {ventilators} as shown on the shop drawings. Use concealed fasteners when possible. Exposed fasteners to match colour of roof sheet.

### **3.3 CLEAN-UP**

- .1 Clean exposed panel surfaces in accordance with manufacturer's instructions.
- .2 Repair and touch up with colour matching high grade enamel minor surface damage, only where permitted by the Architect and only where appearance after touch-up is acceptable to Architect.
- .3 Replace damaged panels and components that, in opinion of the Architect, cannot be satisfactorily repaired.

## **SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Metal flashings and trim.
- .2 Gutters

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 07 92 00 - Joint Sealants.
- .3 Division 23 – Heating, Ventilating, and Air-Conditioning (HVAC): Prefabricated curb for mechanical equipment.
- .4 Division 26 – Electrical: Flashing sleeves and collars for electrical items protruding through roofing membrane.

#### **1.3 REFERENCES**

- .1 ASTM A167-99(2009) - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .2 ASTM A653/A653M-09 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3 ASTM B32-08 - Solder Metal.
- .4 ASTM B101- 07 - Lead-Coated Copper Sheet and Strip for Building Construction.
- .5 ASTM B370-09 - Copper Sheet and Strip for Building Construction.
- .6 ASTM D2178-04 - Asphalt Glass Felt Used in Roofing and Waterproofing.
- .7 ASTM D4586-07 - Asphalt Roof Cement, Asbestos-Free.
- .8 ASTM D226-06 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- .9 CAN/CGSB-51.34-M86 - Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .10 CCBDA (Canadian Copper & Brass Development Association) - Copper in Architecture Handbook.
- .11 Province of British Columbia Roofing Contractors Association – Roofing Specifications Manual.
- .12 NRCA (National Roofing Contractors Association - USA) - Roofing and Waterproofing Manual.
- .13 SMACNA (Sheet Metal and Air Conditioning Contractors' National Association) - Architectural Sheet Metal Manual.

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Refer to Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:

- .1 Coordinate with other work having a direct bearing on work of this section.
- .2 Coordinate with the work for installing flashing reglets.
- .3 Pre-installation Meetings: Convene one (1) week before starting work of this section.

#### **1.5 SUBMITTALS FOR REVIEW**

- .1 Refer to Section 01 33 00: Submission procedures.
- .2 Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- .3 Samples:
  - .1 Submit one set of full range of prefinished metal colours for selection by Consultant.
  - .2 Submit two (2) samples 300 mm in size illustrating selected metal pre-coated finish colour.

#### **1.6 SUBMITTALS FOR INFORMATION**

- .1 Refer to Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements.

#### **1.7 CLOSEOUT SUBMITTALS**

- .1 Refer to Section 01 78 10: Submission procedures.

#### **1.8 QUALITY ASSURANCE**

- .1 Perform Work to SMACNA Manual, standard details and requirements. Maintain one (1) copy of each document on site.
- .2 Fabricator Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five (5) years documented experience.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.

#### **1.9 DELIVERY, STORAGE, AND PROTECTION**

- .1 Refer to Section 01 61 00: Transport, handle, store, and protect products.
- .2 Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- .3 Prevent contact with materials which may cause discolouration or staining.

### **PART 2 - Products**

#### **2.1 SHEET MATERIALS**

- .1 Sheet Aluminum: commercial quality, Grade 33, 20 guage, PVC coated colour for Architect.
- .2 Gutters:
  - .3 Sheet Aluminum: Gutters: PVC coated. 20 gauge. Standard profile, submit to architect for selection. Color as selected by Architect.

- .4 Trough Size as per the drawings
- .5 Trough Supports: aluminum spaced hangers to support weight and size of gutter. PVC coated. 20 gauge. Color as selected by Architect.
- .6 Downpipes: 20 gauge aluminum. Round profile. PVC coated. 20 gauge. Color as selected by Architect.
- .7 Downpipe straps: 0.72 mm thick aluminum. PVC coated. 20 gauge. Color as selected by Architect.
- .8 Sealant: As per Section 07 92 00 – Joint Sealants.
- .9 Elbows and tees: aluminum same as trough. PVC coated. 20 gauge. Color as selected by Architect.
- .10 Leave stop downpipe filter, accessible height above grade. Finish PVC coated. Color as selected by Architect.

## **2.2 ACCESSORIES**

- .1 Fasteners: PVC coated Aluminum to match finish material, Galvanized steel, Aluminum, Stainless steel Copper, Same material and finish as flashing metal, with soft neoprene washers.
- .2 Underlayment: See Air Barriers Section 07 27 00
- .3 Primer: See Air Barriers Section 07 27 00
- .4 Plastic Cement: ASTM D4586, Type I II.
- .5 Reglets: Surface mounted Recessed type, galvanized steel rigid extruded PVC; face and ends covered with plastic tape.
- .6 Solder: ASTM B32; 50/50 type.

## **2.3 FABRICATION**

- .1 Form sections true to shape, accurate in size, square, and free from distortion or defects.
- .2 Fabricate cleats of same material as sheet, inter-lockable with sheet.
- .3 Form pieces in longest possible lengths.
- .4 Hem exposed edges on underside 13 mm, mitre and seam corners.
- .5 Form material with standing seams.
- .6 Fabricate corners from one piece with minimum 450 mm long legs; seam for rigidity, seal with sealant.
- .7 Fabricate vertical faces with bottom edge formed outward 6 mm and hemmed to form drip.
- .8 Fabricate flashings to allow toe to extend 50 mm over roofing. Return and brake edges.

## **2.4 FINISHES**

- .1 Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 0.4 mm (15 mil).

## **PART 3 - Execution**

### **3.1 EXAMINATION**

- .1 Refer to Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, reglets in place, and nailing strips located.
- .3 Verify roofing termination and base flashings are in place, sealed, and secure.

### **3.2 PREPARATION**

- .1 Verify that waterproof membranes are undamaged.

### **3.3 INSTALLATION**

- .1 Conform to drawing details included in the NRCA manual.
- .2 Apply asphalt felt and self-adhesive membrane underlays.
- .3 Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
- .4 Apply plastic cement compound between metal flashings and felt flashings.
- .5 Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- .6 Seal metal joints watertight.

### **3.4 FIELD QUALITY CONTROL**

- .1 Refer to Section 01 45 00: Field inspection.
- .2 Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

## **END OF SECTION**

## **PART 1      GENERAL**

### **1.1      SUBMITTALS**

- .1      Section 01 00 10 - General Instructions.
- .2      Division 22 - Mechanical.
- .3      Division 26 - Electrical.

### **1.2      REFERENCES**

- .1      Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1      Material Safety Data Sheets (MSDS).
- .2      Underwriter's Laboratories of Canada (ULC)□
  - .1      ULC-S115-1995, Fire Tests of Fire stop Systems.

### **1.3      DEFINITIONS**

- .1      Work under this section includes the fire stopping of all penetrations through walls or ceiling assemblies or roof assemblies which are shown on the drawings as requiring to be fire-rated. Where shown on the drawings, whether new or existing walls.
- .2      Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.
- .3      Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.
- .4      Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.
- .5      Tightly Fitted; penetrating items that are cast in place in buildings of non-combustible construction or have "0" annular space in buildings of combustible construction.
  - .1      Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.

- .6 Fire stopping and smoke seals within mechanical assemblies (i.e., inside ducts, dampers) and electrical assemblies (i.e. inside cable trays) are specified in Mechanical and Electrical Divisions respectively.

#### **1.4 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .5 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  - .1 Test reports: in accordance with CAN-ULC-S101 for fire endurance and CAN-ULC-S102 for surface burning characteristics. ☐
    - .1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.
  - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence and cleaning procedures.
  - .4 Manufacturer's Field Reports: submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in PART 3 - FIELD QUALITY CONTROL.

#### **1.5 QUALITY ASSURANCE**

- .1 Qualifications: ☐
  - .1 Installer: company specializing in fire stopping installations with 5 years documented experience.
- .2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of ☐ this Section.
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.

- .3 Co-ordination with other building subtrades.
- .4 Review manufacturer's installation instructions and warranty requirements.
- .3 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY ☐CONTROL, schedule site visits, to review Work, at stages listed.
  - .1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
  - .2 Twice during progress of Work at 25% and 60% complete.
  - .3 Upon completion of Work, after cleaning is carried out.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle materials in accordance with Section 01 00 10 - General ☐Instructions.
  - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
  - .3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings.
- .2 Storage and Protection:
  - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.
- .3 Waste Management and Disposal:
  - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **PART 2 PRODUCTS**

### **2.1 GENREAL**

- .1 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.☐
  - .1 Asbestos-free materials and systems capable of maintaining effective barrier against ☐flame, smoke and gases in compliance with



requirements of CAN-ULC-S115 and not to ☐ exceed opening sizes for which they are intended. ☐

- .2 Fire stop system rating: as required to match rating of rated assembly.
- .2 Service penetration assemblies: systems tested to CAN-ULC-S115.
- .3 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115.
- .4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
- .5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: ☐ elastomeric seal.
- .6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.
- .9 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.
- .10 Sealants for vertical joints: non-sagging.

## 2.2 MANUFACTURERS

- .1 Acceptable Manufacturers: Subject to compliance with requirements specified in this Section, manufacturers offering products that may be incorporated into the Work include; but are not limited to, the following:
  - .1 3M Canada Inc.
  - .2 A/D Fire Protection Systems Inc.
  - .3 Firestop Systems Inc.
  - .4 Hilti Canada Ltd.
  - .5 Tremco Ltd.

## **2.3 PERFORMANCE/DESIGN CRITERIA**

- .1 Delegated Design Requirements: Design firestopping and smoke seals required by the Contract Documents to withstand fire ratings indicated and in accordance with requirements of the Building Code, and as described in Section 01 35 00.
- .2 Performance Requirements: Manufacturer shall design proprietary assemblies to withstand the listed ratings in accordance with the Building Code, Underwriters Laboratories Canada, and authorities having jurisdiction, and as follows:

## **2.4 FIRESTOPPING AND SMOKE SEALS: GENERAL**

- .1 Compatibility: Provide firestopping and smoke seals systems that are compatible with one another, with the substrates forming openings, and with the items, if any, penetrating firestopping and smoke seals systems, under conditions of service and application, as demonstrated by firestopping and smoke seals system manufacturer based on testing and field experience:
- .2 Accessories: Provide components for each firestopping and smoke seals systems that are needed to install fill materials. Use only components specified by firestopping and smoke seals system manufacturer and approved by the qualified testing and inspecting agency for firestopping and smoke seals systems indicated.
  - .1 Permanent forming, damming and backing materials, including the following:
    - I. Slag or rock wool fibre insulation.
    - II. Sealants used in combination with other forming, damming or backing materials to prevent leakage of fill materials in liquid state.
    - III. Fire-rated form board.
    - IV. Fillers for sealants.
  - .2 Temporary forming materials.
  - .3 Substrate primers.
  - .4 Collars.
  - .5 Steel sleeves.
  - .6 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
  - .7 Water: potable, clean and free from injurious amounts of deleterious substances.
  - .8 Metal fire stop: Commercial galvanized steel, to ASTM A1008/A1008M, zinc coating 260 g/m<sup>2</sup>, minimum metal core thickness 0.912 mm.
  - .9 Steel Deck Moulded Flute Inserts: One piece moulded mineral fibre flute inserts, sized for steel deck profiles, for placement at top of fire rated wall assemblies:

- I. Acceptable material: Hilti CP777 Speed Plugs.
- .10 Labels: Peel-and-stick labels printed with the following information:
  - I. ATTENTION: FIRE RATED ASSEMBLY. DO NOT MODIFY
  - II. Name of firestopping manufacturer
  - III. Names of products used
  - IV. Hour Rating of Assembly
  - V. Manufacturers standard detail number, or Engineered Judgement identifier; ULC or cULus Number
  - VI. Date of installation
  - VII. Name of installing Subcontractor
  - VIII. Contact telephone number for repair or replacement of firestopping materials.

## **2.5 FILL MATERIALS**

- .1 Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.
- .2 Firestopping and Smoke-seals Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrating item.
- .3 Intumescent Putties: Non-hardening dielectric, water resistant putties containing no solvents, inorganic fibres, or silicone compounds.
- .4 Intumescent Spray Foam: Expanding spray-in-place intumescent foam sealant.
- .5 Silicone Foams: Multi-component, silicone based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.
- .6 Silicone Sealants: Moisture curing, single component, silicone based, neutral curing elastomeric sealants

## **2.6 ACCESSORIES**

- .1 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .2 Water: potable, clean and free from injurious amounts of deleterious substances.
- .3 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.

- .4 Metal fire stop: Commercial galvanized steel, to ASTM A1008/A1008M, zinc coating 260 g/m<sup>2</sup>, minimum metal core thickness 0.95 mm (20 ga.).

## **PART 3 EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

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

### **3.2 PREPARATION**

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.
  - .1 Ensure that substrates and surfaces are clean, dry and frost free.
- .2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's □ instructions.
- .3 Maintain insulation around pipes and ducts penetrating fire separation.
- .4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

### **3.3 INSTALLATION**

- .1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.
- .2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
- .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
- .4 Tool or trowel exposed surfaces to neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.

### **3.4 SEQUENCES OF OPERATION**

- .1 Proceed with installation only when submittals have been reviewed by Consultant.
- .2 Install floor fire stopping before interior partition erections.
- .3 Mechanical pipe insulation: certified fire stop system component.
  - .1 Ensure pipe insulation installation precedes fire stopping.

### **3.5 FIELD QUALITY CONTROL**

- .1 Inspections: notify Consultant when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.
- .2 Manufacturer's Field Services:
  - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, ☐ installing, applying, protecting and cleaning of product and submit Manufacturer's Field ☐ Reports as described in PART 1 - SUBMITTALS.
  - .2 Provide manufacturer's field services consisting of product use recommendations and ☐ periodic site visits for inspection of product installation in accordance with manufacturer's ☐ instructions.
  - .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

### **3.6 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess ☐ materials, rubbish, tools and equipment.
- .3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

### **3.7 SCHEDULE**

- .1 Fire stop and smoke seal at:
  - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions ☐ and walls.
  - .2 Edge of floor slabs at curtain wall and precast concrete panels.
  - .3 Top of fire-resistance rated masonry and gypsum board partitions.

- .4 Intersection of fire-resistance rated masonry and gypsum board partitions.
- .5 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and □ walls.
- .6 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
- .7 Openings and sleeves installed for future use through fire separations.
- .8 Around mechanical and electrical assemblies penetrating fire separations.
- .9 Rigid ducts: greater than 129 cm<sup>2</sup> : fire stopping to consist of bead of fire stopping material □ between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

**End of Section**

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**PART 1        GENERAL**

**1.1        SECTION INCLUDES**

- .1        Furnish all labour, material, equipment and services necessary to completely seal both interior and exterior of joints in exterior walls and elsewhere as indicated and as specified.
- .2        Work includes all sealants not specified in other sections.

**1.2        RELATED SECTIONS**

- .1        Section 01 33 00 - Submittal Procedures.
- .2        Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .3        Section 01 45 00 - Quality Control.
- .4        Section 01 00 10 - General Instructions
- .5        Section 06 20 00 - Finish Carpentry.
- .6        Section 06 40 00 - Architectural Woodwork.
- .7        Division - Mechanical
- .8        Division - Electrical.

**1.3        REFERENCES**

- .1        American Society for Testing and Materials International, (ASTM) .1 ASTM C919-02, Standard Practice for Use of Sealants in Acoustical Applications.
- .2        Canadian General Standards Board (CGSB)
  - .1        CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
  - .2        CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
  - .3        CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
  - .4        CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
  - .5        CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.
- .3        Department of Justice Canada (Jus)
  - .1        Canadian Environmental Protection Act, 1999 (CEPA).

- .4 General Services Administration (GSA) - Federal Specifications (FS) ☐ .1 FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS) .1 Material Safety Data Sheets (MSDS).
- .6 Transport Canada (TC) ☐ .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

#### **1.4 SUBMITTALS**

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit samples of each type of material and colour.

#### **1.5 QUALITY ASSURANCE / MOCK-UP**

- .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 Construct mock-up to show location, size, shape and depth of joint s complete with back-up ☐ material, primer, caulking and sealant.
- .3 Mock-up will be used:
  - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
- .4 Locate where directed.
- .5 Allow 24 hours for inspection of mock-up by Consultant before proceeding with sealant work.
- .6 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. ☐ Approved mock-up may remain as part of finished Work.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, handle, store and protect materials in accordance with Section 01 00 10 - General Instruction.
- .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

#### **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse in accordance with Section 01 74 21 Construction/Demolition Waste Management And Disposal.



- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate packaging material for recycling in accordance with Waste Management Plan.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and □Municipal regulations.
- .6 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto□ground or in other location where it will pose health or environmental hazard.
- .7 Divert unused joint sealing material from landfill to official hazardous material collections site.
- .8 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.
- .9 Fold up metal banding, flatten, and place in designated area for recycling.

## **1.8 PROJECT CONDITIONS**

- .1 Environmental Limitations:□
  - .1 Do not proceed with installation of joint sealants under following conditions:
    - .1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.
    - .2 When joint substrates are wet.
- .2 Joint-Width Conditions:
  - .1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:□
  - .1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

## **1.9 ENVIRONMENTAL REQUIREMENTS**

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.
- .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

- .3 Ventilate area of work as directed by Consultant by use of approved portable supply and exhaust fans.

## **PART 2 PRODUCT**

### **2.1 SEALANT MATERIALS**

- .1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.
- .2 When low toxicity caulks are not possible, confine usage to areas which off-gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.
- .3 Where sealants are qualified with primers use only these primers.

### **2.2 SEALANT MATERIAL DESIGNATIONS**

- .1 All materials used in this Contract shall be of the highest quality, as manufactured by nationally recognized manufacturers and of the type indicated on the drawings and in this specification.
- .2 Where possible, choose materials with recycled content and regional materials
  - .1 Type 1: Exterior or Interior Concrete Pavements (Traffic Surfaces): Polyurethane base multi- component, ASTM C920-14, Type 1, self-leveling for horizontal joints; Type 2, non-sag for vertical portion of joints. Tremco THC 900 for horizontal joints, Tremco Dymeric for vertical joints or approved equivalent.
  - .2 Type 2: Exterior Control Joints (Vertical and Horizontal Exposed Locations) Three-component polyurethane sealant meeting ASTM C920-14, Tremco Dymeric #240 or equivalent.
  - .3 Type 3: Exterior Cladding: Single-component polyurethane sealant meeting ASTM C920-14, Tremco Dymonic FC, Vulkem #921 or equivalent
  - .4 Type 4: Acoustic Caulking: Synthetic rubber acoustic sealant meeting ASTM C920-14. Tremco acoustic sealant or approved equivalent.
  - .5 Type 5: Interior Exposed Locations: Acrylic, one part, ASTM C834-10, Contractor's Waterproofing Sealant (CWS) by Dow Corning, Sovolac by Sonneborn, Tremco #834 or equivalent.
  - .6 Type 6: Concealed Locations (Exterior or Interior): Butyl rubber, one component butyl- polyisobutylene base, CGSB 37-29, Tremco Butyl Sealant, Bakor Polybitume #570-05.
  - .7 Type 7: Mildew Resistant Sealant: Silicone to ASTM C920-14, Dow Corning 786

- .8 Type 8: Poly Vapour Barrier Sealant: CAN/CGSB 19.21-M87. by Tremco. (Under slab locations only.) \_\_\_\_\_
- .3 Colour as selected by the Consultant from the manufacturer's standard colours. At all visible locations colour match to an adjoining material as instructed by the Consultant.

## **2.3 PRIMERS**

- .1 Use a type recommended by the sealant manufacturer to suit substrate types and conditions.

## **2.4 BACK-UP RODS AND BOND BREAKERS**

- .1 General: Diameter 30-50% larger than joint width.
- .2 Joint Fillers:
  - .1 General: Compatible with primers and sealants, outsized 30 to 50 percent.
  - .2 Polyethylene, Urethane, Neoprene or Vinyl (Vertical Joints): Extruded closed cell foam, Shore A hardness 20, tensile strength 20 to 30 psi.
  - .3 Neoprene or Butyl Rubber (Horizontal Joints): Round solid rod, Shore A hardness 70.
- .3 Bond Breaker: Pressure sensitive plastic tape, which will not bond to sealants.

## **2.5 JOINT CLEANER**

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

# **PART 3 EXECUTION**

## **3.1 EXAMINATION**

- .1 Examine all surfaces to which the work of this section is to be applied and ensure that all conditions are suitable to provide a complete and satisfactory installation.
- .2 Manufacturer's representative to review substrate condition and confirm acceptance in writing prior to commencement of exterior work. Copy of manufacturer's acceptance to be provided to Consultant.

- .3 Commencement of work will indicate acceptance of surfaces and conditions.
- .4 Report any unsatisfactory surfaces or conditions to the Consultant.

### **3.2 JOINT PREPARATION**

- .1 Remove all deleterious contaminants (coatings, sealers, curing compounds, water repellents, grease oil, dirt water etc.) existing on joint surfaces, and which would impair the adhesion of the sealant in the opinion of the Contractor and the manufacturer's representative.
- .2 Apply primer per manufacturers recommendations to obtain optimal adhesion.

### **3.3 WORKMANSHIP**

- .1 Set joint filler units at proper depth of position in the joints to co-ordinate with other work, including the installation of bond breakers, backer rods, and sealers. Do not leave voids or gaps between the ends of joint filler units, except where shown to be omitted or recommended to be omitted by the sealant manufacturer for the application shown.
- .2 Joint profile and adhesion to be confirmed by cut tests as determined by Consultant. Repair test areas at no additional cost to Owner

### **3.4 SEALANT LOCATIONS**

- .1 External door and window frames, inside and outside - head and jambs – Type 3
- .2 Junction of toilet fixtures with walls and floors (mildew resistant); junction of vanities with walls (mildew resistant) – Type 7
- .3 Interior joints between dissimilar materials where shown including but not limited to bath and wall, ceramic tile and stone and ceramic tile and gypsum board wall – Type 4 at dry locations – Type 3 at wet locations
- .4 Exterior Thresholds: Set in two full beads – Type 2
- .5 Control and expansion joints in floors and walls – Type 2
- .6 Penetrations at exterior wall cladding materials, such as services and fixtures – Type 3
- .7 All areas noted and obviously required and to protect interior from exterior water and air infiltration.

### **3.5 APPLICATION**

- .1 Comply with the manufacturer's printed instructions and recommendations.
- .2 For joints where movement is possible, apply backer rod to achieve a joint depth of one half the joint width but not less than 9mm (3/8"); for joints larger than 25mm (1") use a depth of 13mm (1/2").
- .3 Use pressure gun fitted with suitable nozzle. Use sufficient pressure to fill voids and joints solid.
- .4 Form surface of sealant smooth, free from ridges, wrinkles, sags or air pockets and imbedded impurities. Neatly tool surface to a slight concave appearance.
- .5 Tool sealants to achieve air tight joints. Use wet tools as required.
- .6 Ensure bead is solid, filling entire space between sides and bedding materials, exerting sufficient pressure to obtain maximum bond, by allowing sealant to bulge out in advance of nozzle.
- .7 Apply sealant within recommended temperature ranges. Consult manufacturer when sealant can not be applied within recommended temperature range.

### **3.6 CURE AND PROTECTION**

- .1 Cure sealants in compliance with the manufacturer's instructions and recommendations.
- .2 Protect sealant from contamination and degradation by other materials.

### **3.7 PROTECTION**

- .1 Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into the voids of adjoining surfaces.

### **3.8 PROTECTION AND CLEAN-UP**

- .1 Protect adjacent work from damage, staining, disfigurement caused by the work of this section.
- .2 Promptly as the work proceeds, and on completion, keep the premises clean and free from rubbish, debris, surplus materials, and equipment accumulation.

**END OF SECTION**

## **SECTION 08 11 13 - METAL DOORS AND FRAMES**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Standard and Insulated thermal-break pressed steel frames.
- .2 Standard and Insulated Hollow metal steel doors.

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 57 13 - Construction Activity Pollution Prevention.
- .3 Section 01 74 20 - Waste Management and Disposal.
- .4 Section 08 71 00 - Door Hardware: Hardware, silencers, weatherstripping.
- .5 Section 08 80 50 - Glass and Glazing.
- .6 Section 09 91 10 - Painting: Field painting of doors and frames.

#### **1.3 REFERENCES**

- .1 ASTM A653/A653M-09 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 CAN4-S104-M80 (R1985) - Fire Tests of Door Assemblies.
- .3 CAN4-S105-85 (R1992) - Fire Door Frames Meeting the Performance Required by CAN4-S104.
- .4 CAN/ULC-S701-05 - Thermal Insulation, Polystyrene, Boards and Pipe Covering.
- .5 CAN/ULC-S702-09 - Thermal Insulation, Mineral Fibre, for Buildings.
- .6 CAN/ULC-S704-03 - Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
- .7 CGSB-41-GP-19Ma-1984 - Rigid Vinyl Extrusions for Windows and Doors.
- .8 CAN/CSA-G40.20-04/G40.21-04 (R2009) - General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .9 CSA-W59-03 (R2008) - Welded Steel Construction (Metal Arc Welding).
- .10 CSDMA (Canadian Steel Door Manufacturers Association)
  - .1 Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2000.
  - .2 Selection and Usage Guide for Commercial Steel Doors and Frames, 2009.
- .11 DHI (Door Hardware Institute) - The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
- .12 NFPA 80 - Fire Doors and Fire Windows (2010 Edition).
- .13 NFPA 252-2008 - Methods of Fire Tests of Door Assemblies.

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Coordinate the work with frame opening construction, door, and hardware installation.
- .3 Sequencing: Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

#### **1.5 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Indicate door and frame configurations and finishes, location of cut-outs for hardware reinforcement.
- .3 Shop Drawings:
  - .1 Indicate frame elevations, reinforcement, anchor types and spacing, location of cut-outs for hardware, and finish.
  - .2 Indicate door elevations, internal reinforcement, closure method, and cut-outs for glazing louvers finishes.

#### **1.6 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Manufacturer's Installation Instructions: Indicate special installation instructions.
- .3 Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

#### **1.7 CLOSEOUT SUBMITTALS**

- .1 Section 01 78 10: Submission procedures.

#### **1.8 QUALITY ASSURANCE**

- .1 Products of This Section: Manufactured to ISO 9000, ISO 14000 certification requirements.
- .2 Conform to requirements of CSDMA.
- .3 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten (10) documented experience.

#### **1.9 REGULATORY REQUIREMENTS**

- .1 Fire-Rated Door and Frame Construction: Labelled and listed to CAN4-S104 and NFPA 252.
- .2 Fire-Rated Door Construction: Rate of rise of 250 C degrees across door thickness.
- .3 Installed Door and Frame Assembly: Conform to NFPA 80 for fire-rated class as scheduled.
- .4 Submit project specific test reports certifying energy efficiency requirements of door and frame assembly will meet the energy efficiency requirements by applicable regulations.

### **1.11 DELIVERY, STORAGE, AND PROTECTION**

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Remove doors and frames from wrappings or coverings upon receipt on site and inspect for damage.
- .3 Store in vertical position, spaced with blocking to permit air circulation between components.
- .4 Store materials on planks or dunnage, out of water and covered to protect from damage.
- .5 Clean and touch up scratches or disfigurement caused by shipping or handling with zinc-rich primer.

## **PART 2 - Products**

### **2.1 MATERIALS**

- .1 Sheet Steel: Galvanized steel to ASTM A653/A653M, commercial grade (CS), Type B.
  - .1 Exterior Doors: coating designation Z275.G90
  - .2 Interior Doors: coating designation Z75.
- .2 Reinforcement Channel: To CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653/A653M, ZF75 (A25).

### **2.2 DOOR CORE MATERIALS**

- .1 Honeycomb Core: Structural small cell 25.4 mm 1 maximum kraft paper honeycomb; weight 36.3 kg per ream minimum, density 16.5 kg/cu m minimum, sanded to required thickness
- .2 Fibreglass Core: ASTM C553 or ASTM C665, loose batt type, density; 24 kg/cu m minimum.
- .3 Polystyrene Core: ASTM C578, Type 1, rigid extruded fire retardant, closed cell board, density 16 to 32 kg/cu m, thermal values RSI-1.0 minimum.
- .4 Polyisocyanurate Core: ASTM C591 (unfaced) ASTM C1289, (faced), rigid modified polyisocyanurate, closed cell board, 32 kg/cu m, thermal value minimum RSI-1.9.
- .5 Temperature Rise Rated (TRR): Core composition to provide fire-protection rating and limit temperature rise on unexposed side of door to 250 degrees C at 30 or 60 minutes, as determined by governing code requirements, core tested as part of a complete door and frame assembly, to CAN4-S104, and listed by a nationally recognized testing agency having a factory inspection service.

### **2.3 ADHESIVES**

- .1 Cores and Steel Components: Heat resistant, structural reinforced epoxy, resin based adhesive.
- .2 Lock Seam: Reinforced epoxy resin, high viscosity, thicksotropic sealant.

### **2.4 PRIMERS**

- .1 Rust inhibitive touch-up only.

### **2.5 ACCESSORIES**

- .1 Door Silencers: Single stud rubber/neoprene.
- .2 Exterior Top Caps: Rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19MA.
- .3 Frame Thermal Breaks: Rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19MA.



- .4 Removable Glazing Stops: Formed galvanized steel channel, minimum 16 mm high, accurately fitted, butted at corners and fastened to frame sections with counter-sunk tamper proof sheet metal screws.
  - .5 Bituminous Coating: Fibred asphalt emulsion.
  - .6 Weatherstripping: Specified in Section 08 71 00.
- Glass: As specified in Section 08 80 50.

## **2.6 FABRICATION - DOORS**

- .1 Exterior Doors: Laminated core construction.
- .2 Interior Doors: Laminated core construction.
- .3 Longitudinal Edges: Mechanically inter-locked, continuously welded, filled and sanded with no visible edge seams.
- .4 Mortised, blanked, reinforced, drilled and tapped for templated hardware, in accordance with templates provided by hardware supplier.
- .5 Reinforce for surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware. Carbon steel, welded in place, prime painted, to the following thicknesses: Hinge, pivot reinforcement – 3.5 mm; Lock face, flush bolts, concealed bolts – 2.5 mm.
- .6 Top and Bottom Channels: Inverted, recessed, 1.2 mm steel channels, full width welded. Provide closure channel at top edge of exterior doors. Provide weep holes in exterior door bottom channel.
- .7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

## **2.7 LAMINATED CORE CONSTRUCTION**

- .1 Exterior Doors: Both face sheets 1.6 mm steel, with honeycomb, polystyrene, polyisocyanurate, core, laminated under pressure to face sheets.
- .2 Interior Doors: Both face sheets 1.2 mm steel with honeycomb core and temperature rise rated core where scheduled, laminated under pressure to face sheets.

## **FABRICATION - FRAMES**

- .1 Exterior Frames: 1.6 mm thick base metal thickness.
  - .1 Frames: Welded-type construction, thermally broken.
  - .2 Transom Frames, Sidelight and Window Assemblies: Welded type construction thermally broken.
- .2 Interior Frames: 1.6 mm thick base metal thickness.
  - .1 Door Frames and Window Assemblies: Welded type construction.
  - .2 Transom Frames: Welded type construction.
  - .3 Sidelight Assemblies: Welded type construction.
- .3 Mullions for Double Doors: Fixed type, of same profiles as jambs.
- .4 Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.
- .5 Mortised, blanked, reinforced, drilled and tapped for templated hardware, in accordance with templates provided by hardware supplier.
- .6 Reinforce frames wider than 1 200 mm with roll formed steel channels fitted tightly into frame head, flush with top.

- .7 Prepare frames for silencers. Provide three (3) single silencers for single doors and mullions of double doors on strike side. Provide two (2) single silencers on frame head at double doors without mullions.
- .8 Attach fire rated label to each fire rated door unit.
- .9 Fabricate frames to suit masonry wall coursing with 100 mm head member.

### **PART 3 - Execution**

#### **3.1 EXAMINATION**

- .1 Refer to Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that opening sizes and tolerances are acceptable; check floor area within path of door swing for flatness.
- .3 Verify doors and frames are correct size, swing, rating and opening number.
- .4 Remove temporary shipping spreaders.

#### **3.2 INSTALLATION**

- .1 Install doors and frames to CSDMA.
- .2 Install fire-rated doors and frames in accordance with NFPA 80, and local authority having jurisdiction.
- .3 Coordinate with masonry, gypsum board, concrete wall construction for anchor placement.
- .4 Coordinate installation of glass and glazing.
- .5 Coordinate installation of doors and frames with installation of hardware specified in Section 08 71 00.
- .6 Set frames plumb, square, level and at correct elevation.
- .7 Secure anchorages and connections to adjacent construction.
- .8 Brace frames rigidly in position while building-in. Install wood spreaders at third points of frame rebate height to maintain frame width. Provide vertical support at centre of head for openings exceeding 1 200 mm in width.
- .9 Remove wood spreaders after frames have been built-in.
- .10 Make allowance for deflection to ensure structural loads are not transmitted to frame product.
- .11 Install doors, and hardware in accordance with hardware templates and manufacturer's instructions.
- .12 Adjust operable parts for correct clearances and function.
- .13 Install louvers, glazing and door silencers.
- .14 Finish paint as specified in Section 09 91 10.
- .15 Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.
- .16 Provide a formed metal drip section the full width of the frame opening for exterior doors.

#### **3.3 ERECTION TOLERANCES**

- .1 Refer to Section 01 73 00: Tolerances.
- .2 Maximum Diagonal Distortion: 1.5 mm measured with straight edges, crossed corner to corner.

**END OF SECTION**

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## **PART 1 GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .3 Section 06 20 00 - Finish Carpentry.
- .4 Section 08 11 00 - Metal Doors and Frames.
- .5 Section 08 71 00 - Door Hardware.
- .6 Section 08 80 50 - Glazing.

### **1.2 REFERENCES**

- .1 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
  - .1 Quality Standards for Architectural Woodwork 1998.
- .2 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-71.19-M88, Adhesive, Contact, Sprayable.
  - .2 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.
- .3 Canadian Standards Association (CSA International).
  - .1 CSA A440.2-98, Energy Performance of Windows and Other Fenestration Systems.
  - .2 CSA O115-M1982 (R2001), Hardwood and Decorative Plywood.
  - .3 CAN/CSA O132.2 Series-90 (R1998), Wood Flush Doors.
  - .4 CAN/CSA-O132.5-M1992 (R1998), Stile and Rail Wood Doors.
  - .5 CAN/CSA-Z808-96, A Sustainable Forest Management System: Guidance Document.
  - .6 CSA Certification Program for Windows and Doors 00.
- .4 Environmental Choice Program (ECP).
  - .1 CCD-045-92, Sealants and Caulking Compounds.
  - .2 CCD-046-92, Adhesives.
- .5 National Fire Protection Association (NFPA).
  - .1 NFPA 80-1999, Standard for Fire Doors and Fire Windows.
  - .2 NFPA 252-1999, Standard Method of Fire Tests of Door Assemblies.

- .6 Underwriters' Laboratories of Canada (ULC).
  - .1 CAN-4S104M-80 (R1985), Fire Tests of Door Assemblies.
  - .2 CAN4-S105M-85 (R1992), Fire Door Frames Meeting the Performance Required by ☐ CAN4-S104.

### 1.3 SUBMITTALS

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet in ☐ accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
  - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Indicate door types and cutouts for lights, sizes, core construction, transom panel ☐ construction and cutouts.

### 1.4 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit one 300 x 300 mm corner sample of each type wood door.
- .3 Show door construction, core, glazing detail and faces.
- .4 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

### 1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: ☐
  - .03 AWMAC – Architectural Woodwork Manufacturers Association of Canada. QSI Manual, Architectural Woodwork Quality Standards Illustrated.
- .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .4 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- .1 Storage and Protection:
  - .1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity□has been completed.
  - .2 Store doors in well ventilated room, off floor, in accordance with manufacturer's□recommendations.
  - .3 Protect doors from scratches, handling marks and other damage. Wrap doors.
  - .4 Store doors away from direct sunlight.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Dispose of packaging material for recycling in accordance with site waste management program.
- .3 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.
- .4 Divert unused adhesive material from landfill to official hazardous material collections site.
- .5 Do not dispose of unused paint materials into sewer systems, into lakes, streams, onto ground or □in locations where it will pose health or environmental hazard.

## **PART 2 PRODUCT**

### **2.1 WOOD FLUSH DOORS**

- .1 Solid core: to CAN/CSA-O132.2.1.
  - .1 Construction:
    - .1 Solid particleboard core: stile and rail frame bonded to particleboard core with wood lock blocks, 3-ply construction.
    - .2 Face Panels: as specified on door schedule: Plastic laminate veneer with solid 3mm PVC matching edge trims. Laminate colours as section 06 41 11
    - .3 Adhesive: Type II (water resistant) for interior doors.

.3

## **2.2 FABRICATION**

- .1 Fabricate doors in accordance with QSI Manual requirements.
- .2 Vertical edge strips to match face veneer.
- .2 Prepare doors for glazing as indicated. Provide glazing stops with mitred corners.
- .3 Bevel vertical edges of single acting doors 3 mm in 50 mm on lock side and 1.5 mm in 50 mm on hinge side.
- .4 Radius vertical edges of double acting doors to 60 mm radius.
- .5 Provide waterproof non-staining membrane at cutouts on exterior doors to exclude moisture from core.

## **2.3 FINISHING**

- .01 Use materials that are compatible when combined together in finishing system.
- .02 Apply finishes in clean dust free site, heated, with adequate ventilation to ensure proper drying/curing of each coat.
- .03 Include application of finish system to top and bottom of doors (finish all 6 surfaces of doors) to seal doors completely.
- .04 Seal all edges of paint grade doors before shipping from factory. Use clear sanding sealer.

## **PART 3 EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

### **3.2 INSTALLATION**

- .1 Unwrap and protect doors in accordance with CAN/CSA-O132.2 Series, Appendix A.
- .3 Install doors and hardware in accordance with manufacturer's printed instructions and CAN/CSA-O132.2 Series, Appendix A.
- .4 Adjust hardware for correct function.
- .5 Install glazing in accordance with Section 08 80 50 - Glazing.
- .6 Install stops.

- .7 Secure transom and side panels by means of stops.

### **3.3 ADJUSTMENT**

- .1 Re-adjust doors and hardware just prior to completion of building to function freely and properly.

### **3.4 CLEANING**

- .1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .2 Remove traces of primer, caulking; clean doors and frames.
- .3 Clean glass and glazing materials with approved non-abrasive cleaner.
- .4 On completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**End of Section**



## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

Overhead coiling insulated doors.

### **1.2 RELATED SECTIONS**

Section 05500 - Metal Fabrications: Support framing and framed opening.

Section 06200 - Finish Carpentry: Wood jamb and head trim.

Section 09900 - Painting: Field applied finish.

Section 16130 - Raceway and Boxes: Conduit from electric circuit to door operator and from door operator to control station.

Section 16150 - Wiring Connections: Power to disconnect.

### **1.3 REFERENCES**

NFRC 102 - Test Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems.

ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Element.

ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

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

ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

NEMA MG 1 - Motors and Generators.

### **1.4 DESIGN / PERFORMANCE REQUIREMENTS**

Overhead coiling insulated doors:

1. Wind Loads: Design door assembly to withstand wind/suction load in compliance with local wind load factors of the BC Building Code. without damage to door or assembly components in conformance with ASTM E 330.
2. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.

Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

Products Requiring Electrical Connection: Listed and classified by CSA acceptable to authority having jurisdiction as suitable for purpose specified.

### **1.5 SUBMITTALS**

Submit under provisions of Section 01300.

Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Details of construction and fabrication.
4. Installation instructions.

Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, and accessories. Include relationship with adjacent construction.

Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.

Manufacturer's Certificates: Certify products meet or exceed specified requirements.

Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

### **1.6 QUALITY ASSURANCE**

Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.

Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.

Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.

3. Refinish mock-up area as required to produce acceptable work.

### **1.7 DELIVERY, STORAGE, AND HANDLING**

Store products in manufacturer's unopened packaging until ready for installation.

Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.

Store materials in a dry, warm, ventilated weathertight location.

### **1.8 PROJECT CONDITIONS**

Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

### **1.9 COORDINATION**

Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

### **1.10 WARRANTY**

Warranty: Manufacturer's limited door and operator system, except the counterbalance spring and finish, to be free from defects in materials and workmanship for 3 years or 20,000 cycles, whichever occurs first.

Warranty: Manufacturer's limited door warranty for 2 years for all parts and components.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

Acceptable Manufacturer: Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: [www.overheaddoor.com](http://www.overheaddoor.com). E-mail: [info@overheaddoor.com](mailto:info@overheaddoor.com).

Local Distributor: **Overhead Door Company of Vancouver**  
11 Burbidge St. #202  
Coquitlam, British Columbia V3K 7B2  
Toll Free: 877-453-4411  
Tel: 604-420-4411  
Fax: 604-420-5749  
E-mail: [vansales@overheaddoor.ca](mailto:vansales@overheaddoor.ca)

Substitutions: Requests for substitutions will be considered in accordance with provisions of Section 01600.

## **2.2 INSULATED OVERHEAD COILING SERVICE DOORS**

Overhead Coiling Stormtite Insulated Service Doors: Overhead Door Corporation 625 Series.

1. Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
  - a. Flat profile type F-265i for doors up to 40 feet (12.19 m) wide.
  - b. Front slat fabricated of:
    - 1) 20 gauge galvanized steel.
    - 2) 18 gauge galvanized steel.
  - c. Back slat fabricated of:
    - 1) 24 gauge galvanized steel.
  - d. Slat cavity filled with CFC-free foamed-in-place, polyurethane insulation.
    - 1) R-Value: 7.7, U-Value: 0.13.
    - 2) Sound Rating: STC-21.
2. Performance:
  - a. Through Curtain Sound Rating: Sound Rating: STC-28 (STC-30+ with HZ noise generator) as per ASTM E 90.
  - b. Installed System Sound Rating: STC-21 as per ASTM E 90.
  - c. U-factor: 0.91 NFRC test report, maximum U-factor of no higher than 1.00.
3. Finish:
  - a. Galvanized Steel: Slats and hood galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.
    - 1) Polyester Top Coat.
      - (a) Gray polyester.
    - 2) Powder coat: PowderGuard
      - (a) PowderGuard Weathered Finish: Industrial textured powder coat provides a thicker, more scratch resistant coat. Applied to entire door system including slats, guides, bottom bar and head plate.
    - 3) Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
4. Weatherseals:
  - a. Vinyl bottom seal, exterior guide and internal hood seals.
  - b. Interior guide weatherseal.
  - c. Lintel weatherseal.
5. Bottom Bar: Three structural steel angles.
  - a. Two galvanized steel angles minimum thickness 1/8 inch (3 mm) bolted back to back to reinforce curtain in the guides.
6. Guides: Three Structural steel angles
  - a. Finish: PowderGuard Weathered finish with iron/black powder.
7. Brackets:
  - a. Galvanized steel to support counterbalance, curtain and hood.
8. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance is adjustable by means of an adjusting tension wheel.
9. Hood: Provide with internal hood baffle weatherseal.
  - a. 24 gauge galvanized steel with intermediate supports as required.

10. Manual Operation:
  - a. Chain hoist backup
11. Electric Motor Operation: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
  - a. Sensing Edge Protection:
    - 1) Pneumatic sensing edge.
  - b. Operator Controls:
    - 1) Push-button operated control stations with open, close, and stop buttons.
    - 2) Controls for exterior location.
    - 3) Controls flush mounted.
12. Windload Design:
  - a. Standard windload shall be to local windload factors of BC Building Code
13. Locking:
  - a. Chain keeper locks for chain hoist operation.
14. Wall Mounting Condition:
  - a. Face-of-wall mounting.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

Verify opening sizes, tolerances and conditions are acceptable.

Examine conditions of substrates, supports, and other conditions under which this work is to be performed.

If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.2 PREPARATION**

Clean surfaces thoroughly prior to installation.

Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### **3.3 INSTALLATION**

Install in accordance with manufacturer's instructions.

Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

Fit and align assembly including hardware; level and plumb, to provide smooth operation.

Coordinate installation of electrical service with Section 16150. Complete wiring from disconnect to unit components.

Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.

Install perimeter trim and closures.

Instruct Owner's personnel in proper operating procedures and maintenance schedule.

### **3.4 ADJUSTING**

Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.

Adjust hardware and operating assemblies for smooth and noiseless operation.

### **3.5 CLEANING**

Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.

Remove labels and visible markings.

Touch-up, repair or replace damaged products before Substantial Completion.

### **3.6 PROTECTION**

Protect installed products until completion of project.

## **END OF SECTION**

## **1. GENERAL**

### **1.1. RELATED WORK**

1.1.1. Misc. Steel Fabrications for Door frames and support plates for operator and spring mounts

1.1.2. Electrical hookup to door operators

### **1.2. SCOPE OF WORK**

1.2.1. Supply and installation of One (1) Standard duty metal faced insulated overhead door as specified and as shown on the drawings.

### **1.3. SUBMITTALS**

1.3.1. Product Data: Submit manufacturers product data and installation instructions for each type of sectional door. Include both published data and any specific data prepared for this project.

1.3.2. Shop Drawings: Submit shop drawing for approval prior to fabrication. Include detailed plans, elevations, and details of framing members, required clearances, anchors, and accessories. Include relationship with adjacent materials.

### **1.4. QUALITY ASSURANCE**

1.4.1. Manufacturer: Sectional doors shall be manufactured by a firm with a minimum of five years experience in the fabrication and installation of sectional doors. Manufacturers shall submit evidence of ability to meet performance and fabrication requirements specified, and include a list of five projects of similar design and complexity completed within the past five years.

1.4.2. Installer: Installation of sectional doors shall be performed by the authorized representative of the manufacturer.

1.4.3. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

1.4.4. Pre-Installation Conference: Schedule and convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.5. DELIVERY, STORAGE, AND HANDLING

1.5.1. Deliver materials and products in labeled protective packages. Store and handle in strict compliance with manufacturers instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.

1.6. Warranty

1.6.1. All doors shall carry a five year warranty,

1.7. Compliance

1.7.1. All doors shall comply with ANSI A 216.1-1977, NAGDM 102-1976; NAGDM 101-1975.



## **2. PART 2 - PRODUCTS**

### **2.1. METAL FACED INSULATED DOOR**

- 2.1.1. Interior and Exterior panel sections shall be corrosion resistant, hot dipped galvanized sheet steel with rotary embossed pebble grain texture panel and horizontal stiffening ribs. Sections shall be fabricated by a continuous foamed in place polyurethane lamination process resulting in a homogeneous metal/foam/metal sandwich with a nominal thickness of 1.625". Sections shall be roll-formed to produce a thermal break. Sections shall be roll formed to provide a channel for drip-free openings and to accept EPDM rubber tube seal the entire length of the panel. End caps shall be from 16ga galvanized steel.
- 2.1.2. Include the installation of any and all additional support framing required for door tracks, torsion springs, motor mounts etc.
- 2.1.3. Air Infiltration: Air infiltration rating of .14cfm psf at 15mph (ASTM E 283-73 test)
- 2.1.4. Insulation: shall be rigid foamed in place polyurethane core with a certified R value of 14.59
- 2.1.5. Finish: Interior and exterior finish shall be baked on two coat polyester paint.
- 2.1.6. Weather Seals: Between each section shall be EPDM rubber tube seals fitted inside each panel joint. Bottom seal shall be an EPDM rubber O. Side stripping shall be neoprene strip.

### **2.2. Wind load Design:**

- 2.2.1. ANSI/NAGDM 102 standards and as required by code.

### **2.3. Hardware:**

- 2.3.1. Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.

2.4. Lock:

- 2.4.1. Interior galvanized single unit, on metal faced door.

2.5. Weather-stripping:

- 2.5.1. Flexible PVC on bottom section, Jamb seals, and Header seal.

2.6. Track:

- 2.6.1. 3 inches wide, Heavy duty, roll-formed 13 gauge galvanized steel, with galvanized steel mounting brackets, gauge adjusted per design requirements.

2.7. Electric Motor Operation:

- 2.7.1. Provide UL listed electric operator, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
- 2.7.2. Externally mounted on drive side of door.
- 2.7.3. Power Supply: 220 Volts AC.
- 2.7.4. Manual chain hoist override capability.

2.8. Entrapment Protection:

- 2.8.1. Pneumatic, astragal auto reversing sensing edge full width of door.
- 2.8.2. Photoelectric sensors, auto reversing sensors.

2.9. Operation Controls:

- 2.9.1. Push-button operated control stations with open, close, and stop buttons for surface mounting, for interior and exterior location.

### **3. EXECUTION**

#### **3.1. PREPARATION**

- 3.1.1. Take field dimension and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

#### **3.2. INSTALLATION**

- 3.2.1. Strictly comply with manufacturer's installation instructions and recommendations.
- 3.2.2. Coordinate installation with adjacent work to ensure proper clearances to lighting, radiant heaters, sprinkler heads, structural members, and to allow for maintenance clearances.
- 3.2.3. Instruct Owners personnel in proper operating procedures and maintenance schedule.
- 3.2.4. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
- 3.2.5. Fit and align door assembly including hardware, level and plumb, to provide smooth operation
- 3.2.6. Position head and jamb weather-stripping to contact door sections when closed; secure in position.

#### **3.3. ADJUSTING AND CLEANING**

- 3.3.1. Protect installed products until completion of project.
- 3.3.2. Test sectional doors for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- 3.3.3. Touch-up damaged coatings and finishes and repair minor damage. Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer of material or product being cleaned.

## **SECTION 08 44 13 - GLAZED ALUMINUM SYSTEMS**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Glazed extruded aluminum, thermally-enhanced framing system.
- .2 Glazed extruded aluminum thermally-broken entrance framing and doors.
- .3 Interior Glazed partitions at vestibules etc.
- .4 Insulated aluminum corners and column covers.
- .5 Integral air barrier and vapour retarder.
- .6 Aluminum sill and head flashings and perimeter sealant.
- .7 Perimeter installation angles where indicated.
- .8 Other components necessary to provide complete, weather-tight assemblies to suit Project location and special requirements.

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 57 13 - Construction Activity Pollution Prevention.
- .3 Section 01 74 20 - Waste Management and Disposal.
- .4 Section 07 26 00 - Vapour Retarders: Perimeter vapour seal between curtain wall system and adjacent construction.
- .5 Section 07 27 00 - Air Barriers: Perimeter air seal between curtain wall system and adjacent construction.
- .6 Section 07 92 00 - Joint Sealants: System perimeter sealant and back-up materials.
- .7 Section 08 80 50 – Glass and Glazing.

#### **1.3 REFERENCES**

- .1 AA (Aluminum Association) DAF 45-2003 - Designation System for Aluminum Finishes.
- .2 AAMA CW-DG-1-96 (R2005) - Aluminum Curtain Wall Design Guide Manual.
- .3 AAMA CWG-1-89 (R2004) - Installation of Aluminum Curtain Walls.
- .4 AAMA CW-10-04 - Care and Handling of Architectural Aluminum from Shop to Site.
- .5 AAMA CW-11-85 - Design Windloads for Buildings and Boundary Layer Wind Tunnel Testing.
- .6 AAMA 501-05 - Methods of Test for Exterior Walls.
- .7 AAMA 501.1-05 - Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure.
- .8 AAMA 611-98 - Voluntary Specifications for Anodized Finishes Architectural Aluminum.

- .9 AAMA 1503-98 - Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections.
- .10 AAMA 2603-02 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
- .11 AAMA 2605-05 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- .12 AAMA TIR A1-04 - Sound Control for Fenestration Products.
- .13 AAMA RPC-00 - Rain Penetration Control.
- .14 ASTM A36/A36M-08 - Carbon Structural Steel.
- .15 ASTM A123/A123M-08 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .16 ASTM A653/A653M-08 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .17 ASTM B209M-07 - Aluminum and Aluminum-Alloy Sheet and Plate (Metric)ASTM B221M-07 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
- .19 ASTM E283-04 - Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- .20 ASTM E330-02 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- .21 ASTM E331-00 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- .22 ASTM E413-04 - Classification for Rating Sound Insulation.
- .23 ASTM E1105-00(2008) - Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference.
- .24 CAN/CGSB-1.40-97 - Anti-corrosive Structural Steel Alkyd Primer.
- .25 CAN/CGSB-1.181-99 - Ready-Mixed, Organic Zinc-Rich Coating.
- .26 SSPC (The Society for Protective Coatings): Steel Structures Painting Manual.

#### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Applicable Standards: Window and door systems shall conform to the requirements in
  - .1 AAMA/WDMA/CSA 101/1.S.2/A440. "NAFS – North American Fenestration standard/Specification for Windows, Doors, and Skylights," and
  - .2 CSA A440S1, "Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440, NAFS – North American Fenestration standard/Specification for Windows, Doors, and Skylights."
  - .3 Performance grades for windows and doors shall be selected according to the Canadian Supplement set out in CSA A440 so as to be appropriate for the conditions and geography in which the windows and doors will be installed.
  - .4 B C Energy Efficiency Act
- .5 Meet following assembly thermal performance: U-0.31 (IP), Shading Coefficient – 0.45
- .2 System Design: Design and size components to withstand dead loads and live loads caused by positive and negative wind loads acting normal to plane of wall as calculated in accordance with the B C Building Code 2012, "Applicable Standards" as listed in Sentence 1.4.1 and as measured in accordance with ASTM E330.

- .1 Most stringent design factors shall apply to this fully exposed building in an open terrain with hurricane force wind.
- .2 The Complete System is required to withstand jet blast of a 737 using apron break away apron thrust.
- .3 Deflection: Limit mullion deflection to flexure limit of glass, L/240 with full recovery of glazing materials.
- .4 Minimum Energy efficiency standards: BC Energy Efficiency Regulations require the following maximum heat rate (U-Value): 2.57 W/(m<sup>2</sup>.k)
- .5 System Assembly: Accommodate without damage to system, components or deterioration of seals, movement within system, movement between system and perimeter framing components, dynamic loading and release of loads, deflection of structural support framing, tolerance of supporting components, shortening of building concrete structural columns.
- .6 Sound Attenuation Through Wall System (Exterior to Interior): STC 50, measured in accordance with ASTM E413. Insulating glass units are to have a min. STC of 38
- .7 Air Infiltration: Limit air infiltration through assembly to 0.02 l/s/sq m (of wall area, measured at a reference differential pressure across assembly of 75 Pa as measured in accordance with ASTM E283. Conform to CAN/ULC-S741, "Air Barrier Materials – Specification."
- .8 Water Leakage: None, when measured in accordance with ASTM E331.
- .9 Expansion / Contraction: System to provide for expansion and contraction within system components caused by a cycling temperature range of 95 degrees C ( over a 12 hour period without causing detrimental effect to system components.
- .10 System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.
- .11 Condensation Resistance: Refer to CSA A440 standard for minimum condensation resistance temperature index for framing. No condensation shall form on any interior surfaces of the aluminum members, before any of the exposed areas for the sealed glazing unit reaches the dew point temperature.
- .12 Air and Vapour Seal:
  - .1 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.
  - .2 Position thermal insulation on exterior surface of air barrier and vapour retarder.
- .13 Not Permitted: Vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system.

## **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Refer to Section 01 31 00: Project management and coordination procedures.
- .2 Coordination: Coordinate with other work having a direct bearing on work of this section.
  - .1 Coordinate the Work with installation of firestopping, air barrier placement, vapour retarder placement, and installing ductwork to rear of louvres components or materials.
- .3 Pre-Installation Meeting: Convene one (1) week before starting work of this section to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

## **1.6 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, and internal drainage details.
- .3 Prior to fabrication and to ordering performance glass, submit under signature and seal of qualified Engineer registered in the province of British Columbia, project specific test reports certifying energy efficiency requirements of the glazed assemblies will meet the project thermal performance requirements *without additional cost to the Owner for changes to the performance glass specified.*
- .4 Design Data: Provide framing member structural and physical characteristics, calculations dimensional limitations.
- .5 Shop Drawings: Indicate windload and seismic design as per B C Building Code 2012 and "Applicable Standards" as listed in Sentence 1.4.1, system dimensions, framed opening requirements and tolerances, anticipated deflection under load, affected related work, weep drainage network, expansion, and contraction joint location and details, and field welding required.
  - .1 Submit Engineered Shop Drawing signed and sealed by a qualified Engineer registered to practice in BC.
  - .2 Submit Structural Schedule S-B prior to fabrication of this work, and Structural Schedule S C-B on completion of work and prior to request for Substantial Performance of Contract.
  - .3 Indicate materials, core thicknesses, profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
  - .4 Completely indicate all dimensions, and dimensions to be confirmed on the site.
  - .5 The Consultant's review of the shop drawings shall be for conformity to the design concept and for general arrangement only and such review shall not relieve this Trade Contractor of any of the responsibilities as stated or any other applicable items herein specified.

## **1.7 SUBMITTALS FOR INFORMATION**

- .1 Refer to Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements.

## **1.8 CLOSEOUT SUBMITTALS**

- .1 Refer to Section 01 78 10: Submission procedures.

## **1.9 QUALITY ASSURANCE**

- .1 Perform Work in accordance with AAMA CW-DG-1 - Aluminum Curtain Wall Design Guide Manual.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten (10) years documented experience.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience and successful performance.
- .4 Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the place where the Project is located.

## **1.10 MOCK-UP**

- .1 Refer to Section 01 43 00: Requirements for mock-up.

- .2 Provide mock-up including intermediate mullion, corner mullion, and vision glass light. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.
- .3 Locate where directed by Consultant.
- .4 Approved mock-up may remain as part of the Work.

#### **1.11 DELIVERY, STORAGE, AND PROTECTION**

- .1 Refer to Section 01 61 00: Transport, handle, store, and protect products.
- .2 Handle work of this Section in accordance with AAMA CW-10.
- .3 Protect prefinished aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather. Puncture wrappings at ends for ventilation.
- .4 Protect curtain wall material against damage from elements, construction activities, and other hazards before, during and after curtain wall installation.

#### **1.12 ENVIRONMENTAL REQUIREMENTS**

- .1 Refer to Section 01 35 26: Environmental conditions affecting products on site.
- .2 Do not install sealants when ambient temperature is less than 5 degrees C.
- .3 Maintain this minimum temperature during and after installation of sealants.

#### **1.13 WARRANTY**

- .1 Refer to Section 01 78 10: Warranties.
- .2 Provide manufacturers written warranty, signed and issued in the name of Owner, to replace the following items for defective material and workmanship for the time stated from date of Substantial Performance:
  - .1 Framing, panels and glazing: Failure of performance requirements specified; 2 years
  - .2 Sealed glass units: misting, dusting and seal failure; as indicated in Section 08 81 00 – Glass Glazing.
  - .3 Joint sealants, caulking: Failure to maintain seal; 2 years.
  - .4 Aluminum brake shapes: oil-canning and delaminations; 2 years.
  - .5 Failure of operating components to function normally; 2 years.
  - .6 Finishes: Failure of specified finishes not attributable to normal weathering; 20 years.

### **PART 2 - Products**

#### **2.1 MANUFACTURERS AND SYSTEMS**

- .1 The following named systems form the basis of acceptance. *It is entirely the responsibility of the glazing contractor to select the system that is capable of meeting all of the performance requirements at the lowest price.*
- .2 General Requirements: Glazed, extruded aluminum, thermally-broken, 25.4 mm (1") insulating glazing units, standard glazed entrance doors, and outswing casement windows. Finish: Clear anodic coating. **The complete glazing and door system shall be able to withstand jet blast of a 737 using apron breakaway thrust. The System shall also meet small and large missile impact and cycle test.**
- .3 Acceptable System:  
Kawneer 1600 UT System 1, 64 mm (2.5") face, thermally-enhanced curtain wall, with fiberglass pressure



plates, with 350 Medium Stile entrance doors. Kawneer 1600 UT System 1, thermally-enhanced frame window, 64 mm (2.5") face, with fiberglass pressure plates, with AA 900 Isoweb Window and Vent Insert.

- .4 Alternate System:
  - .1 Standard 6" depth thermally broken aluminum frame system with reinforcement designed and sealed by engineer is acceptable if meeting: 1) same performance standards by acceptable Kawneer Systems listed in Sentence 2.1.3; 2) applicable design standards as set out in Paragraph 1.4 in this Section.
  - .2 **US Aluminum Clear Anodized Series 2200 Curtain Wall with 50mm (2") face and 100mm (4") back frame, US Aluminum Series 400T Medium Stile Doors and US Aluminum Series IT451 Clear Anodized Storefront is acceptable if meeting the performance standards as set out in Paragraph 1.4 in this Section (PTA-1)**
- .5 Substitutions: Refer to Section 01 62 00.

## 2.2 MATERIALS

- .1 Aluminum: Materials recommended by manufacturer for type of use and finish indicated, and as follows:
  - .1 Sheet and Plate: In accordance with ASTM B209/B209M, and ANSI H35.1 AA1100-H14, or AA5005-H32 or H34, anodizing quality.
  - .2 Extruded Bars, Rods, Profiles, and Tubes: In accordance with ASTM B221/B221M), and ANSI H35.1 AA6063-T5 or T6, anodizing quality.
  - .3 Extruded Structural Pipe and Tubes: In accordance with ASTM B429, and ANSI H35.1 AA6061-T6 or AA6063-T6, anodizing quality.
  - .4 Structural Profiles: In accordance with ASTM B308/B308M, anodizing quality.
  - .5 Welding Rods and Bare Electrodes: CSA W59.2.
- .2 Steel Reinforcement: Coat steel with manufacturer's standard corrosion resistant primer applied immediately after surface preparation and pre-treatment, and as follows:
  - .1 Rolled Sheet or Strip: CSA G40.20/G40.21.
  - .2 Structural Shapes, Plates and Bars: CSA G40.20/G40.21.
- .3 Brackets and Reinforcements: Manufacturer's standard high strength aluminum with non-staining, nonferrous shims for aligning system components.
- .4 Reinforcing Members: Aluminum, non-magnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- .5 Sealant: For sealants required within fabricated curtain wall system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- .6 Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.
  - .1 Use self-locking devices where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration.
  - .2 Reinforce members as required to receive fastener threads.
  - .3 Use only concealed fasteners, unless use of exposed fasteners has been accepted in writing by the Consultant.
  - .4 Finish exposed portions to match framing system.
  - .5 Use slip joint linings, spacers, and sleeves at movement joints of material and type recommended by manufacturer.
- .7 Anti-Rotation Channels: Thermally-broken, full-length, anti-rotation device designed to provide symmetrical bearing for pressure cap and to mechanically retain air seal membrane to the inner face of the glazing pocket.

- .8 Anchors: Three way adjustable anchors that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
- .9 Concealed Flashing: Manufacturer's standard corrosion resistant, non-staining, non-bleeding flashing compatible with adjacent materials.
- .10 Glazing Gaskets: Manufacturer's standard sealed corner pressure glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers; as recommended by manufacturer for joint type.

## **2.3 COMPONENTS**

- .1 Mullion Profile: 190 Narrow Stile, as indicated on drawings, thermally-broken with interior section insulated from exterior pressure plate with fiberglass pressure plate, matching stops and pressure plate of sufficient size and strength to provide bite on glass and infill panels; drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system; internal mullion baffles to eliminate "stack effect" air movement within internal spaces.
- .2 Reinforced Mullion: profile of extruded aluminum framing with internal reinforcement of shaped steel structural section.
- .3 Infill Panel: Internally reinforced, glazing edge sealed permitting internal air movement to glazing space, outside air barrier line:
  - .1 Outer Face: 1.6 mm thick aluminum.
  - .2 Core: Glass fibre
  - .3 Inner Face: 1.6 mm thick aluminum.
- .4 Flashings: aluminum finish to match curtain wall mullion sections where exposed secured with concealed fastening method.
- .5 Exterior Doors: Thermally-broken or with thermally isolated interior face.
- .6 Operable casement window: Single handle multi-point locks. Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum windows, and sized to accommodate sash weight and dimension.
- .7 Brackets and Reinforcements: Provide manufacturer's standard high-strength aluminum brackets and reinforcements. Provide non-staining, nonferrous shims to install and align.
- .8 Concealed Flashing: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding flashing; compatible with adjacent materials.
- .9 Exposed Flashing and Closures: Aluminum sheet.
  - .1 Minimum Thickness: 0.060 inch (1.5 mm).
- .10 Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories; compatible with adjacent materials.
  - .1 Movement Joints: Provide slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.
  - .2 Aluminum-Retaining-Cap Fasteners: ASTM A 193/A 193M, Series 300 stainless-steel screws; type as recommended by manufacturer.
  - .3 Connections to Supporting Structure: ASTM A 307, zinc-coated steel fasteners.
  - .4 Anchor Bolts: ASTM A 307, Grade A, zinc-coated steel anchor bolts.
- .11 Framing-System Gaskets and Joint Fillers: Manufacturer's standard permanent gaskets and joint fillers for sliding, compression, and nonmoving joints.
- .12 Bituminous Paint: Cold-applied asphalt mastic paint complying with SSPC-Paint 12, except containing no asbestos, and formulated for 30-mil (0.8-mm) thickness per coat.

- .13 Thermal Insulation: As specified in Section 07 21 16.

## **2.4 DOORS - ACCESSORIES**

- .1 Door Hardware: As specified in Section 08 71 00. Provide all hardware of each type from one manufacturer.

## **2.5 GLASS AND GLAZING MATERIALS**

- .1 Glazing Materials: As specified in Section 08 80 50.

## **2.6 SEALANT MATERIALS**

- .1 Sealant and Backing Materials: As specified in Section 07 92 00.

## **2.7 GLAZED SYSTEMS FABRICATION**

- .1 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- .2 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- .3 Prepare components to receive anchor devices. Fabricate anchors.
- .4 Arrange fasteners and attachments to ensure concealment from view.
- .5 Reinforce interior horizontal head rail to receive future drapery track brackets and attachments.
- .6 Reinforce framing members for external imposed loads.

## **2.8 DOOR FABRICATION**

- .1 Doors and framing to be by same manufacturer.
- .2 Fit and assemble all Work in the shop insofar as practical
- .3 Reinforce members and joints with steel plates, bars, rods or angles for rigidity and strength as needed to fulfill performance requirements. Use concealed stainless steel fasteners for jointing which cannot be welded.
- .4 Fit joints tightly and secure mechanically.
- .5 Provide cut-outs and integral reinforcing as required to receive hardware.
- .6 Separate unlike metals or alloys with a heavy coating of bituminous paint, separator gaskets or slip gaskets as required to prevent galvanic action.
- .7 Provide drain holes in glazing recess and an airseal at interior glassline.
- .8 Glazing to be held by pressure plate system with snap-on covers.
- .9 Glass fabrication specified under Section 08 80 50.

## **2.9 FINISHES**

- .1 Clear Anodic Coating: Class I Finish: Architectural Class I, clear coating 0.018 mm or thicker in accordance with AAMA 611.
- .2 Touch-Up Primer for Galvanized Steel Surfaces: SPCC-Paint 20 zinc rich.

- .3 Concealed Steel Items: Primed with iron oxide paint.
- .4 Apply one (1) coat of bituminous paint to concealed aluminum or steel surfaces in contact with cementitious or dissimilar materials.
- .5 For products not available with clear anodic finish: High performance, non-fading, scratch-resistant paint system; Interpon or accepted alternative.

### **PART 3 - Execution**

#### **3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify dimensions, tolerances, and method of attachment with other work.
- .3 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this section.

#### **3.2 CURTAINWALL INSTALLATION**

- .1 Install curtain wall system to manufacturer instructions.
- .2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- .3 Provide alignment attachments and shims to permanently fasten system to building structure.
- .4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.
- .5 Provide thermal isolation where components penetrate or disrupt building insulation.
- .6 Install sill flashings.
- .7 Coordinate attachment and seal of perimeter air barrier and vapour retarder materials.
- .8 Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- .9 Install operating sash glass in accordance with Section 08 80 50, to glazing method required to achieve performance criteria.
- .10 Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.
- .11 Install glass and infill panels in accordance with Section 08 80 50, to glazing method required to achieve performance criteria.
- .12 Install perimeter sealant to method required to achieve performance criteria. Provide drain holes at sills.
- .13 Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

#### **3.3 DOOR - INSTALLATION**

- .1 Obtain all dimensions from the job site.
- .2 Provide data, dimensions and components, anchors and assemblies to be installed by others in proper time for installation.

- .3 Install in accordance with the manufacturer's written instructions and the contract documents, plumb, true, level and rigid.
- .4 Conceal all anchors and fitments. Exposed heads of fasteners not permitted. All joints in exposed work to be flush hairline butt joints.
- .5 Use anchors that will permit sufficient adjustment for accurate alignment. Make allowance for deflection of building structure.
- .6 Build in and provide any supplementary reinforcing and bracing required by assembly loads and deflections.
- .7 Secure Work adequately to structure in a manner not restricting thermal and wind movement.
- .8 Correctly locate and install flashings, deflectors and weep holes and verify proper drainage of moisture to exterior.
- .9 Maintain alignment with adjacent Work.
- .10 Isolate aluminum surfaces from adjacent dissimilar materials and metals with coatings of bituminous paint.
- .11 Verify all stops, gaskets, splines, seals, etc. are perfectly aligned and ready to receive glazing and insulated panels as specified herein.
- .12 Install glazing to details and instruction, using material specified.
- .13 When a full mullion is used at perimeter framing, glazing, pocket may be stabilized for pressure plate with a block of rigid insulation.
- .14 Glazing stops, snap covers and pressure plates shall be of a continuous length from corner to corner, and be fitted at corners.
- .15 All preformed tapes or gaskets shall be of a continuous length corner to corner and shall be cut over length to prevent stretching. Joints, splices and corners shall be mitred and sealed.
- .16 Clean all contact surfaces of glazing with solvent and wipe dry. Verify all glazing channels are clean, true to line, and free of dirt or debris and that weep and drainage vents are open.
- .17 Rest glazing on setting blocks at 1/4 points.
- .18 Seal full perimeter of door lights to provide and maintain the designed air/vapour/thermal barrier integrity and weather tightness.
- .19 Pack fibrous insulation or foamed-in-place insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- .20 Hang doors using hardware scheduled. Adjust as required for proper operation.
- .21 Install weatherstrip to provide positive contact.
- .22 Install sealants and back-up materials in strict accordance with manufacturer's written instruction.
- .23 Make cut-outs for hardware ie: card readers and push buttons.

### **3.4 ERECTION TOLERANCES**

- .1 Section 01 73 00: Tolerances.
- .2 Maximum Variation from Plumb: 1.5 mm/m non-cumulative or 12 mm/30 m , whichever is less.
- .3 Maximum Misalignment of Two Adjoining Members Abutting in Plane: 0.8 mm.
- .4 Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 19 mm and minimum of 6 mm.

### **3.5 FIELD QUALITY CONTROL**

- .1 Refer to Section 01 45 00: Field testing.
- .2 Testing shall be performed per AAMA 503 by qualified independent testing agency.
- .3 Air Infiltration Tests: Conduct tests in accordance with ASTM E 783
- .4 Water Infiltration Tests: Conduct tests in accordance with ASTM E1105
- .5 Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.

### **3.6 MANUFACTURER'S FIELD SERVICES**

- .1 Refer to Section 01 78 10: Prepare and start components.
- .2 Curtain wall product manufacturers to provide field surveillance of the installation of their Products.
- .3 Monitor and report installation procedures, unacceptable conditions.

### **3.7 ADJUSTING**

- .1 Adjust operating sash for smooth operation.

### **3.8 CLEANING**

- .1 Refer to Section 01 74 00: Cleaning installed work.
- .2 Remove protective material from prefinished aluminum surfaces.
- .3 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- .4 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

### **3.9 PROTECTION OF FINISHED WORK**

- .1 Refer to Section 01 78 40: Protecting installed work.
- .2 Protect finished Work from damage.

### **END OF SECTION**

## **Part 1 SECTION 085113 ALUMINUM WINDOWS**

### **PART 1 - GENERAL**

#### **1.1 Related Documents**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 Summary**

- .1 Section includes Kawneer Architectural Aluminum Windows including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of window units. For both fixed and operable units as shown on the drawings.
  - .1 Types of aluminum windows include:
    - a. Kawneer Series 5525 Thermal Windows
    - b. Fixed window and Operable window
    - c. 127 mm frame depth
    - d. Architectural Window Grade AW-PG75-F

#### **1.3 Definitions**

- .1 Definitions: For fenestration industry, standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

#### **1.4 Performance Requirements**

- .1 General Performance: Aluminum-framed window system shall withstand the effects of the following performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- .2 Window System Performance Requirements:
  - .1 Air Infiltration: The test specimen shall be tested in accordance with NAFS-08 as applicable to the project location.
  - .2 Water Resistance: The test specimen shall meet the B5 rating with no water leakage at 500 Pa when tested in accordance with CAN/CSA-A440-00 Windows.
  - .3 Uniform Load Deflection: The test specimen shall meet the C5 rating when tested in accordance with CAN/CSA-A440-00 Windows.
  - .4 Uniform Load Structural: A minimum static air pressure difference of 60 psf (2874 Pa) shall be applied in the positive and negative direction in accordance with ASTM E330. The unit shall be evaluated after each load.
  - .5 Component Testing: Window components shall be tested in accordance with procedures described in AAMA/WDMA/CSA 101/I.S.2/A440-05.
  - .6 Thermal Transmittance: Meet following assembly thermal performance: U-0.31 (IP), Shading Coefficient – 0.45
  - .7 Condensation Resistance (CRF): When tested to CSA-A440-00, the Condensation Index shall not be less than (64 frame) and (66 glass).
  - .8 Forced Entry Resistance: All windows shall conform to ASTM F588, Grade 10.

## 1.5 Submittals

- .1 Product Data: Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of aluminum window indicated.
- .2 Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, operational clearances and installation details.
- .3 Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- .4 Samples for Verification: For aluminum windows and components required.
- .5 Product Schedule: For aluminum windows. Use same designations indicated on Drawings.
- .6 Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type, class, grade, and size of aluminum window. Test results based on use of downsized test units will not be accepted.

## 1.6 Quality Assurance

- .1 Installer Qualifications: An installer which has had successful experiences with installation of the same or similar units required for this project and other projects of similar size and scope.
- .2 Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- .3 Source Limitations: Obtain aluminum windows through one source from a single manufacturer.
- .4 Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum windows and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements." Do not modify size and dimensional requirements.
  - .1 Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- .5 Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - .1 Build mockup for type(s) of window(s) indicated, in location(s) shown on Drawings.
- .6 Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

## 1.7 Project Conditions

- .1 Field Measurements: Verify aluminum window openings by field measurements before fabrication and indicate measurements on Shop Drawings.

## 1.8 Warranty

- .1 Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
  - .1 Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.



## PART 2 - **PRODUCTS**

### 2.1 **Manufacturers**

- .1 Basis-of-Design Product:
  - .1 Kawneer Company Inc.
  - .2 Series 5525 Thermal Windows – Fixed and Operating
  - .3 5" (127) frame depth
  - .4 Architectural Window Grade AW-PG75-F
- .2 Substitutions: Refer to Substitutions Section for procedures and submission requirements.
  - .1 Pre-Contract (Bidding Period) Substitutions: Submit written requests six (6) days prior to bid date.
  - .2 Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
  - .3 Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for window system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum windows for a period of not less than ten (10) years. (Company Name)
  - .4 Test Reports: Submit test reports verifying compliance with each test requirement required by the project.
  - .5 Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.
- .3 Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

### 2.2 **Materials**

- .1 Aluminum Extrusions: Alloy and temper recommended by aluminum window manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.8) wall thickness at any location for the main frame and sash members.
- .2 Thermal Barrier: The thermal barrier shall Kawneer IsoWeb™ consisting of two parallel glass fiber-reinforced nylon strips installed continuously and mechanically bonded to the aluminum.
- .3 Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components.
- .4 Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- .5 Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- .6 Sealant: For sealants required within fabricated windows, provide window manufacturer's standard, permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

### 2.3 **Window System**

- .1 Series 5525 Thermal Windows – Fixed and with Kawneer compatible Operating inserts where shown on the drawings.

## 2.4 Glazing

- .1 Glass and Glazing Materials: Refer to Division 08 Section "Glazing" for glass units and glazing requirements applicable to glazed aluminum window units.
- .2 Sound attenuated safety glazing shall be installed to match existing glazing currently installed on airside.
- .3 Glazing System: Glazing method shall be a wet/dry type in accordance with manufacturer's standards. Exterior glazing shall be silicone back bedding sealant. Interior glazing shall be snap-in type glazing beads with an interior gasket in accordance with AAMA 702 or ASTM C864.

## 2.5 Hardware

- .1 General: All required Kawneer operating hardware for operable opening window units indicated on drawings.

## 2.6 Accessories

- .1 Spacers, Setting Blocks, Gaskets, and Bond Breakers: Manufacturer's standard permanent, non-migrating types in hardness recommended by manufacturer, compatible with sealants, and suitable for system performance requirements.
- .2 Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.
- .3 Sealants and joint fillers for joints at perimeter of window system as specified in Division 7 Section "Joint Sealants".
- .4 Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- .5 Optional Muntin Grids: Extruded aluminum profiles, 6063-T6 alloy and temper and as follows:
  - .1 True muntins.
  - .2 Between the glass muntins.
- .6 Glazing: Factory glazing as required and specified in Division 8 Section "Glazing".
- .7 Optional Perimeters and Trims: Extruded aluminum, 6063-T6 alloy and temper, extruded to profiles and details indicated. Seal exterior joints with manufacturer's standard sealant to assure water-tight joints.
- .8 Coupling Mullions: Shall be extruded aluminum of 6063-T6 alloy and temper of profile and dimensions indicated on drawings. Mullions shall provide structural properties to resist wind pressure required by performance criteria and standards.

## 2.7 Fabrication

- .1 Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
  - .1 Profiles that are sharp, straight, and free of defects or deformations.
  - .2 Accurately fit joints; make joints flush, hairline and weatherproof.
  - .3 Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
  - .4 Physical and thermal isolation of glazing from framing members.
  - .5 Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  - .6 Provisions for field replacement of glazing.

- .7 Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- .2 Window framing shall be designed for screw spline corner construction. Operating sash extrusions shall be tubular with mitred, clip, adhesive, stake joint construction. All framing joints shall be sealed to provide neat weathertight connections.
- .3 Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- .4 Fabricate aluminum windows that are re-glazable without dismantling sash or framing.
- .5 Thermally Improved Construction: Fabricate aluminum windows with an integral, concealed, low-conductance thermal barrier; located between exterior materials and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact. Thermal barriers shall be designed in accordance with AAMA TIR A8.
  - .1 Thermal Barrier: The thermal barrier shall be Kawneer IsoWeb™ consisting of two parallel glass fiber-reinforced nylon strips installed continuously and mechanically bonded to the aluminum.
- .6 Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.
- .7 Sub frames: Provide sub frames with anchors for window units as shown, of profile and dimensions indicated but not less than 0.093-inch (2.4-mm) thick extruded aluminum. Miter or cope corners, and join with concealed mechanical joint fasteners. Finish to match window units. Provide sub frames capable of withstanding design loads of window units.
- .8 Glazing Stops: Provide snap-on glazing stops coordinated with Division 08 Section "Glazing" and glazing system indicated. Provide glazing stops to match frame.

## 2.8 Aluminum Finishes

- .1 Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- .2 Factory Finishing:
  - .1 Kawneer Permanodic™ AA-M10C21A44 / AA-M45C22A44, AAMA 611, Architectural Class I Color Anodic Coating (Color to match main project curtain wall).

## PART 3 - EXECUTION

### 3.1 Examination

- .1 Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight window installation.
  - .1 Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
  - .2 Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76.2 mm) of opening.

- .3 Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
- .4 Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 Installation**

- .1 Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.
- .2 Install aluminum framed window system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- .3 Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- .4 Install aluminum framed window system and components to drain condensation, water penetrating joints, and moisture migrating within system to the exterior.
- .5 Install operating inserts and ensure correct fit and operation.
- .6 Separate aluminum from dissimilar materials to prevent corrosion or electrolytic action at points of contact.

### **3.3 Adjusting, Cleaning, And Protection**

- .1 Adjust operating sashes, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weather tight closure. Lubricate hardware and moving parts.
- .2 Clean aluminum surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- .3 Clean glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- .4 Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- .5 Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

**END OF SECTION 085113**

## **SECTION 08 71 00 - FINISH HARDWARE**

### **PART 1 - General**

#### **SCHEDULE 1 - SECTION INCLUDES**

- 1.1 Hardware for wood, hollow steel, aluminum doors.**
- 1.2 Thresholds.**
- 1.3 Weatherstripping, seals, and door gaskets.**
- 1.4 The supply, installation and termination of all electrified hardware, mechanical hardware and automatic operators specified in this section to form a complete operating system and where applicable integrated with the access control system.
- 1.5 Division 28 – Electronic Safety and Security: Power supply to electric hardware devices card access equipment, security equipment.

#### **SCHEDULE 2 - REFERENCES**

- 1.1 CAN4-S104-M80 (R1985) - Method for Fire Tests of Door Assemblies.
- 1.2 CAN/ULC-S132-2007 - Emergency Exit and Emergency Fire Exit Hardware.
- 1.3 DHI (Door and Hardware Institute Canada) - AHC and EHC certification programs.
- 1.4 DHI (Door Hardware Institute) - A115 series.
- 1.5 DHI (Door Hardware Institute) - WDHS.3 - Hardware Locations for Wood Flush Doors.
- 1.6 BHMA (Builders Hardware Manufacturers Association) - A156 series.
- 1.7 NFPA 80 - Fire Doors, Fire Windows.
- 1.8 NFPA 101- Life Safety Code
- 1.9 NFPA 252 - Fire Tests of Door Assemblies (2008 Edition).
- 1.10 UL 10B - Fire Tests of Door Assemblies.
- 1.11 UL 305 - Panic Hardware.

- 1.12 BCBC – 2012 British Columbia Building Code**  
BC Building Code 2012 applies to this section.

#### **SCHEDULE 3 - ADMINISTRATIVE REQUIREMENTS**

- 1.1 Comply with Division 1 of these specifications.
- 1.2 Hardware Schedule included with this specification is a performance specification only to indicate operational intent.. Bidder shall include for an AHC to provide fully detailed and complete hardware schedule for full and proper door function and operation.
- 1.3 Coordination: Coordinate with other work having a direct bearing on work of this section.
  - a. Coordinate the work with other directly affected sections involving manufacture or fabrication

- of internal reinforcement for door hardware and recessed items.
- b. Coordinate Owner's keying requirements during the course of the Work.

- 1.4 Sequencing: Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

#### **SCHEDULE 4 - SUBMITTALS FOR REVIEW**

- 1.1 Refer to Section 01 33 00: Submission procedures.**

**1.2 Shop Drawings:**

- a. Indicate locations and mounting heights of each type of hardware, schedules, catalogue cuts, electrical characteristics and connection requirements.
- b. Schedule shall be standard vertical format. Headings shall include room designations, door numbers, door size and material, frame material, handing, fire resistance rating, degree of opening, and original hardware group. A schedule of mounting heights shall be included with shop drawings. Provide separate schedules for aluminum doors. Each opening shall have its own item number and only door and hardware assemblies which are identical in every detail, may be grouped together on one heading. Product description shall be complete in every detail as recommended by the manufacturer under ordering procedures including sizes and fasteners.
- c. Engineer drawings including: system block diagrams indicating all components, interconnection and cabling; complete detailed system point to point circuit and riser diagrams, conduit and cable allocations, enclosure and back box types; and all required information to provide a detailed review of functional criteria and equipment assessment. Provide conduit and cabling drawings specific to each application for coordination with Div. 26 and Div. 28 work. Conduit drawings shall show detail for cable hole and grommet locations within curtain wall framing systems.
- d. Submit manufacturer's parts lists, templates. Include the following paragraph for submission of physical samples for verification of selected finish, colour, texture, etc.

#### **SCHEDULE 5 - CLOSEOUT SUBMITTALS**

- 1.1 Refer to Section 01 78 10: Submission procedures.
- 1.2 Operation and Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- 1.3 Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- 1.4 Record Documentation:**
- a. Record actual locations of installed cylinders and their master key code.
  - b. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

#### **SCHEDULE 6 - MAINTENANCE MATERIAL SUBMITTALS**

**1.1 Section 01 78 40: Maintenance and extra material requirements.**

**1.2 Extra Stock Materials:**

Coordinate the following paragraph with Keying article in Part 2.

- a. Provide ten (10) extra key lock cylinders for each master keyed group.

**1.3 Tools:**

- a. Provide special wrenches and tools applicable to each different or special hardware component.
- b. Provide maintenance tools and accessories supplied by hardware component manufacturer.

**SCHEDULE 7 - QUALITY ASSURANCE**

**1.1 Products of This Section: Manufactured to ISO 9000 ISO 14000 certification requirements.**

**1.2 Perform Work to the following requirements:**

- a. BHMA A156 series.
- b. DHI - A115 series.
- c. DHI - WDHS.3.
- d. CSDMA.
- e. NFPA 80.
- f. NFPA 252.
- g. UL 10B.
- h. UL 305.
- i. ULC S132.
- j. CAN4-S104.
- k. Maintain one (1) copy of each document on site.

1.3 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten (10) years documented experience.

1.4 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.

1.5 Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) a qualified person to assist in the work of this section.

1.6 Hardware Supplier Personnel: Employ an Electrified Hardware Consultant (EHC) a qualified person to assist in the electronics and controls work of this section.

**SCHEDULE 8 - REGULATORY REQUIREMENTS**

1.1 Conform to applicable code for Products requiring electrical connection. Listed and classified by ULC and testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

**SCHEDULE 9 - DELIVERY, STORAGE, AND PROTECTION**

- 1.1 Refer to Section 01 61 00: Transport, handle, store, and protect products.
- 1.2 Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

#### **SCHEDULE 10 - WARRANTY**

- 1.1 Refer to Section 01 78 10: Warranties.**
- 1.2 Provide five (5) year manufacturer warranty for door closers.**

#### **SCHEDULE 11 - Coordination**

- .1 Coordinate installation of wall mounted door stops for provision of required backing as specified in Section 06 10 00 – Rough Carpentry.
- .2 All electrified hardware applications and products specified herein have been selected to allow for all available options and therefore the exact operation is deemed to be a site configurable variable. It will be the responsibility of this trade contractor to determine the exact functionality and operational requirement for all electrified hardware as well as the exact requirements for interface to related systems prior to commencing work.
- .3 Coordinate final conduit system design, device locations, and electrical service allocations and requirements. The Division 26 trade contractor shall be responsible for the supply and installation of all industry standard conduit, back boxes, junction boxes, device boxes, and terminal panels to provide a complete conduit system. Provide all manufactured system specific enclosures to Division 26 trade contractor for installation as part of the conduit system. Substantial corrosion resistant pull strings to be installed in all conduit runs.
- .4 Coordinate hardware components with door and frame manufacturers to ensure correct door and frame preparation. Inform manufacturers where conduit may be required within their respective assemblies and provide all required templates for door and frame preparation. Ensure that frames have been prepared correctly and that appropriate back boxes for conduit termination have been provided at correct locations prior to frame installation. Ensure that doors have been prepared correctly for all devices and that doors contain flexible conduit where required.
- .5 Coordinate with aluminum door trade to ensure the proper preparation and fabrication of aluminum doors and frames. Coordinate where holes and grommets are required in framing system to accommodate cabling. Provide physical samples rather than paper templates if requested. If any devices are required to be installed in door or frame assemblies in the shop or during assembly or fabrication, provide such items direct to manufactures in ample time to allow for work to be completed in accordance with construction schedule. Coordinate and template concealed closer holder devices to the required degree of opening to obtain hold open points without door or hardware contacting other surfaces.

#### **PART 2 - Products**

##### **SCHEDULE 1 - MANUFACTURERS**

The following is a general listing of acceptable manufacturers. Refer to Hardware Schedule of this section for application.



.1	Hinges:	Ives: Five Knuckle Ball Bearing Full Mortise Butt Hinges, heavy
.2	Latch Sets:	Schlage ND series
.3	Wireless Electronic Latchsets	Schlage NDE series
.4	Push/Pulls:	CBH
.5	Cylinder Locks:	Schlage
.6	Electric Locks:	Schlage or Salto
.7	Exit Devices:	Von Duprin
.8	Power Supplies:	Von Duprin
.9	Closers:	CBH or LCN
.10	Over Head Stops:	Glynn Johnson
.11	Gasketing Weather-stripping:	Draft Seal
.12	Kick Plates:	CBH
.13	Floor stops:	CBH
.14	Automatic Door Operators:	Horton Automatics or Stanley Access Technologies

Substitutions: Refer to Section 01 60 00.

## **SCHEDULE 2 - TIME DELAYED EXIT INSTALLATIONS**

- 1.1 For doors scheduled to have time delayed egress, supply fully complete and commissioned egress control system consisting of the following, as drawing appended.

- .1 Von Duprin Chexit exit device
- .2 Door frame power transfer
- .3 Power supply
- .4 Code compliant delayed egress signage on door
- .5 Prox reader override
- .6 Door Position Switch
- .7 Remote Alarm
- .8 Fire alarm override

## **SCHEDULE 3 - WIRELESS ELECTRONIC LATCHSETS**

- .1 For doors scheduled with wireless electronic latchsets, provide fully complete and commissioned installation, with instructions, training, software, and all required prox access devices. Include for 25 spare prox access devices for future use.

## **SCHEDULE 4 - KEYING**

- 1.1 Door Locks: Owner will issue instructions for keying. The hardware supplier shall be responsible for the coordination with the owner.
- 1.2 Include construction keying control keying with removable core cylinders. Key to existing keying system.

## **SCHEDULE 5 - FINISHES**

- 1.1 **Finishes:** 626 finish or matching equivalent.

## **PART 3 - Execution**

### **SCHEDULE 1 - EXAMINATION**

- 1.1 Refer to Division one: Verify existing conditions before starting work.
- 1.2 Verify that doors and frames are ready to receive work and dimensions are as indicated on Shop Drawings and as instructed by the manufacturer.
- 1.3 Verify that electric power is available to power operated devices and is of the correct characteristics.

### **SCHEDULE 2 - INSTALLATION**

Only include the following paragraph if a manufacturer actually publishes installation instructions - many do not. If the manufacturer does NOT publish such a document, ensure all install criteria that is important to the project, is specified below.

- 1.1 Install hardware to manufacturer's written instructions.
- 1.2 Use templates provided by hardware item manufacturer.
- 1.3 Mounting heights for hardware from finished floor to centre line of hardware item, refer to drawings and as follows:  
CSDMA, DHI WDMS.3, DHI A115 Series.

### **SCHEDULE 3 - ADJUSTING**

- 1.1 Adjust hardware for smooth operation.

### **SCHEDULE 4 - PROTECTION OF FINISHED WORK**

- 1.1 Refer to Section 01 78 40: Protecting installed work.
- 1.2 Do not permit adjacent work to damage hardware or finish.

### **SCHEDULE 5 - SCHEDULES**

The following 2 pages will assist in preparing a schedule of hardware for the project, identifying all hardware components, style, colour and finish, quantity, and location.

- 1.1 Refer to Hardware Schedule attached.
- 1.2 Refer to Delayed egress schematic attached.

#### 4 Typical Wiring Diagrams

##### Single Door

- The Chexit is used as a controlled egress device with access control.
- The Inhibit Device (card reader) provides additional means of signaling an authorized access to Chexit.
- The Remote Alarm is used as an additional alarm in a remote location.
- Using a door position switch gives added security in case the door is not closed or is forced open.
- The Push Pad releases immediately when the Fire Alarm is active.
- If card readers are required on both sides of the door, the normally closed contacts of the readers should be wired in series.

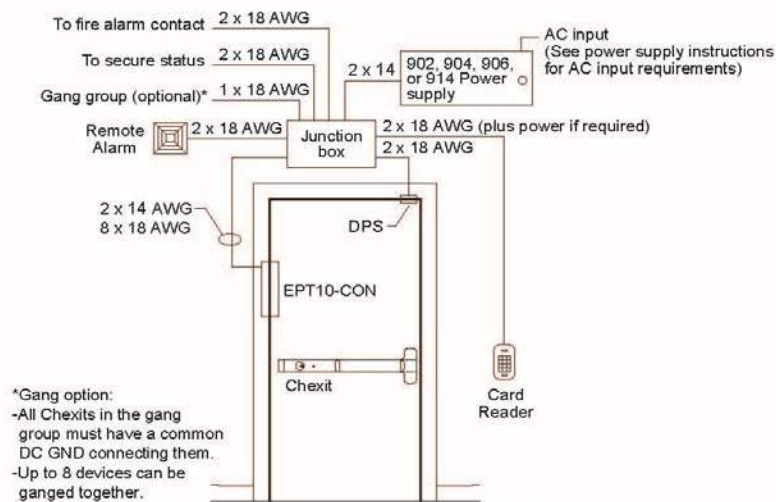


Figure 1. Riser Diagram, Single Door

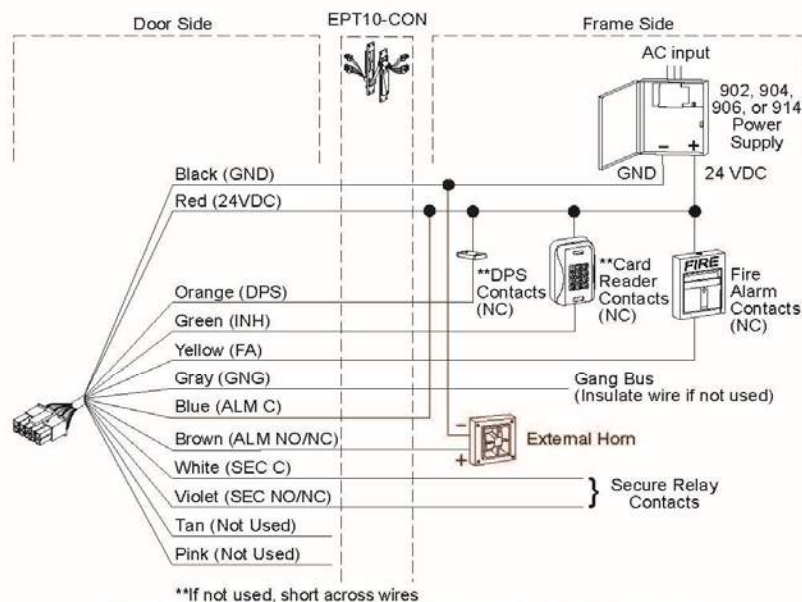


Figure 2. Point-To-Point Diagram, Single Door

FINISH HARDWARE SCHEDULE		ADDENDUM 2 REVISION APRIL 28 2017														REMARKS
DOOR NO	LOCATION	MECHANICAL LATCHSET	WIRELESS ELECTRONIC	DELAYED EGRESS	PUSH PULL	EXIT DEVICE	CLOSER	WEATHER STRIP	THRESH	DOOR STOP	KICK PL					
		SCHLAGE NDE	SCHLAGE NDE	REF SPEC		VD FALCON 24	LGN 1460			CBH 101 CBH 145	CBH 903					
001	MECHANICAL OFFICE	ND10S	X(PUSH SIDE)				X			X						
101A	EX VESTIBULE															
101B	EX VESTIBULE															SERVICE EXSTG DOOR
102	TO OFFICES	ND10S					X			X						SERVICE EXSTG DOOR
104	WASHROOM	ND40S								X						
105A	OVERSIZE VEST		X(PULL SIDE)			X	2X									EXIT DEVICES WITH RODS
105B	OVERSIZE VEST		X(PULL SIDE)			X	2X	X	X	X						ON PUSH SIDE
106	BAG CLAIM															ROLLUP SHUTTER: REF SPEC
107A	ARR VEST															AUTO DOOR AS SPEC
107B	ARR VEST															AUTO DOOR AS SPEC
																NO PULL OR ACCESS FROM INSIDE
1115A	OFFICE		X(PUSH SIDE)				X									
1115B	OFFICE		X(PULL SIDE)				X	X	X		X					
1116A	OFFICE		X(PUSH SIDE)				X									
1116B	OFFICE		X(PULL SIDE)				X	X	X		X					
117A	OFFICE		X(PUSH SIDE)				X									
117B	OFFICE		X(PULL SIDE)				X	X	X		X					
118	WCW				X											
1119	WCW				X											
120	JAN		X(PUSH SIDE)													
121	FROM PBS		X(PULL SIDE)			99 RIM	X			X						HOLD OPEN
125-A	DEP VEST			X		CHEXIT PKG	X			X						HOLD OPEN
125-B	DEP VEST			X		CHEXIT PKG	X			X						HOLD OPEN
125-C	DEP VEST					X		X	X							
127	WC	ND40S														
128	WCW				X											
129	WCW				X											
130A	BAG MAKEUP		X(PUSH SIDE)				X			X	X					WITH PROX READER
130B	BAG MAKEUP		X(PULL SIDE)				X	X	X		X					
130C	BAG MAKEUP															OVERHEAD DOOR REF SPEC
131A	STAIR		X(PULL SIDE)													
131B	STAIR		X (PULL SIDE)				X	X	X		X					FLUSH BOLTS TO INACTIVE LEAF
EX. SC.			X				X				X					

## **I. PART ONE GENERAL**

### **1.01 SUMMARY:**

A. Work included: Furnishing and installing factory fabricated and finished electro-mechanical swinging operator.

B. Related Work:

1. Section 07900 - Caulking
2. Section 08400 - Entrances and Storefronts: Furnishing and installing aluminum doors and frames.
3. Section 08710 - Finish Hardware: Furnishing and installing hardware for swinging entrance doors.
4. Section 08800 - Glazing: Furnishing and installing glass and glazing of swinging entrance doors.
5. Section 12670 - Entrance Mats
6. Section 16210 - Electrical Supply and Termination: Furnish electrical conduit and wiring for controls and operators.

### **1.02 REFERENCES:**

A. Underwriters Laboratories (UL), 333 Pfingsten Road, Northbrook, IL 60062, 847-272-8800, Fax: 847-272-8129.

B. American National Standards Institute (ANSI), 11 W. 42nd St., 13th Floor, New York, NY 10036, 212-642-4900, Fax: 212-398-0023.

C. Builders' Hardware Manufacturers Association (BHMA), 355 Lexington Ave., New York, NY 10017, 212-661-4261, Fax: 212-370-9047.

D. National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269, 800-344-3555, 617-770-3000, Fax: 617-984-7057.

E. Canadian Standards Association (CSA), 178 Rexdale Blvd., Rexdale, ON, Canada M9W 1R3, 416-747-4000, Fax: 416-747-4149.

F. ICBO Evaluation Services, 5360 Workman Mill Road, Whittier, CA 90601, 562-699-0543, Fax: 562-695-4694.

G. International Standards Organization (ISO).

### **1.03 SUBMITTALS:**

A. Product Data: Provide manufacturer's product and complete installation data for all materials in this specification.

B. Shop drawings: Show profiles, joining method, location of components, anchorage details, adjacent construction interface, and dimensions as well as all necessary wiring and electrical requirements.

C. Samples: Sized to adequately represent material.

D. Contract Closeout: Submit the Manufacturer's warranty and performance certifications [if applicable].

E. Installation Guide: Provide a written installation guide and/or installation recommendations.

### **1.04 QUALITY ASSURANCE:**

A. Swinging door operator shall be CERTIFIED by the manufacturer to meet performance design criteria according to the following test standards: [select, if applicable]:

1. ANSI A156.10.
2. NFPA 101.
3. Underwriter's Laboratories 325 (UL) listed.
4. C-UL Certified (equivalent to CSA certified).
5. ICBO (UBC Standard 10-1).

B. Automatic Swinging Door Operator: Shall be manufactured in an ISO 9001 registered manufacturing facility.

#### **1.05 PRODUCT HANDLING:**

A. All materials shall arrive in the manufacturer's original sealed, labeled containers.

B. Store materials in a dry, protected, well-vented area. The contractor shall report damaged material immediately to the delivering carrier and note such damage on the carrier's freight bill of lading.

C. Remove all protective material after installation.

#### **1.06 SUBSTITUTIONS:**

A. Proposals for substitution products will be accepted only from bidding contractors a minimum of 10 working days before the bid due date. The proposed substitution shall meet the performance and quality standards of this specification.

#### **1.07 JOB CONDITIONS:**

A. Verify that other trades are complete before installing the automatic swinging door operator.

B. Mounting surfaces shall be plumb, straight and secure; substrates shall be of proper dimension and material.

C. Refer to the construction documents, shop drawings and manufacturer's installation instructions.

D. Coordinate installation with the glass, glazing and hardware installation.

E. Observe all appropriate OSHA safety guidelines for this work.

#### **1.08 WARRANTY/GUARANTEE:**

A. Manufacturer's Standard Warranty: Warranted materials shall be free of defects in material and workmanship for one year after installation.

## **II. PART TWO        PRODUCTS**

### **2.01 MANUFACTURER:**

A. Acceptable standard is Stanley Access Technologies

65 Scott Swamp Road

Farmington, CT 06032

1-800-722-2377 (7-ACCESS)

Local: 860-677-2861

Fax: 1-860-679-6436

Internet address - <http://www.stanleyworks.com>

## **2.02 SWINGING DOOR OPERATOR:**

A. Swinging Door Operator: Shall be Stanley Magic-Swing Swinging Door Operator - Concealed Application. The system shall consist of electro-mechanical swinging door operator and electrical controls, aluminum header, connecting hardware, actuating controls, guide rails, and on/off/hold open switch. The system shall be completely engineered, manufactured and assembled by Stanley Access Technologies. All components shall be factory assembled, adjusted and tested. All bearings shall be ball or roller type. No bushings shall be used. Provide 120 VAC, 10 amps minimum to electrical door operator. Electrical contractor shall provide service to each operator from junction box for multiple operators.

B. Power Open Operation: The operator shall open the door with a 1/8 HP, DC motor through reduction gears, ball screw actuator, forged steel rack and pinion, and linkage. Door opening speed shall not be less than 1.5 seconds from fully closed to back check (0 degrees - 75 degrees) and 1.0 - 1.5 seconds from back check to fully open (75 degrees - 90 degrees). The drive train shall have positive, constant engagement. The operator shall stop the door in the open position by electrically reducing the motor voltage and stalling against an adjustable 90 degree stop.

C. Spring Closing Operation: The operator shall close the door by spring energy. Closing speed shall be controlled by employing the motor as a dynamic brake. Door closing speed shall be 2.5 - 4.0 seconds from fully open to latch check (90 degrees to 10 degrees) and not less than 1.5 seconds from latch check to fully closed (10 degrees to 0 degrees). The closing spring shall be a helical compression spring, pre-loaded for positive closing action at a low material stress level for long spring life.

D. Aluminum Header Extrusions: Shall be a minimum .156" wall thickness.

E. Aluminum Extrusion Finish: Standard anodized finish shall be [select one: AA-M12-C22-A31 Clear, AA-M12-C22-A44 Dark Bronze or Black]. [Special and painted finishes are available upon request. Specify color finish].

F. Header Case: Shall be 5-1/2" wide by 6" high (124 mm wide by 152 mm high) aluminum extrusions with structurally integrated end caps. The operator shall be sealed against dust, dirt, and corrosion within the header case. Access to the operator and electronic control box shall be provided by a full length removable cover, edge rabbetted to the header to ensure a flush fit.

G. Linkage Assembly: Shall provide positive control of door through entire swing; shall permit use of butt hung, center pivot, and offset pivot hung doors.

H. Controls:

I. Emergency Release: For center pivot door(s) - normal in-swing, the operator shall have a built-in emergency release with controlled spring return to the closed position without manual resetting. While the door is in the emergency release mode, a disconnect switch shall prevent powered operation. No header or jamb mounted stops or cams shall be required for emergency function. Not more than 50 pounds at the lock stile shall be required for emergency use per ANSI A156.10.

J. Manual Use: The operator shall function as a manual door closer in the direction of swing with or without electrical power.

K. Entrapment Protection: The door forces and speeds generated during power opening and manual opening in both directions of swing, and spring closing in both directions of swing shall conform to the requirements of ANSI A156.10.

### **2.03 OPERATING CONDITIONS:**

A. Climatic Conditions: The operator shall be fully lubricated to minimize wear and friction of moving parts, and shall operate between -30 degrees F and +130 degrees F in all climatic conditions.

### **2.04 ELECTRICAL CONTROL:**

A. Electrical control shall incorporate the following: An encoder on the motor shaft shall monitor revolutions and send signals to a microprocessor in the controller. Signals from the encoder define door position without using an external magnet and magnetic switch. The door position data is used for: carpet applications, electronic sensor (Sentrex) applications, open check calculation, MAGIC-TOUCH, and reverse-on-obstruction.

B. Learn speed. When power is first applied and an open signal is received, the controller shall open the door at a speed slightly faster than check speed which allows the controller to "learn" safely yet expediently.

C. A "watchdog" LED shall indicate that the controller is functioning properly by remaining lit (when power is on). Additional LED's shall indicate proper operation of the motor encoder when the door moves.

D. The controller shall have program dip switches to allow selection or change at the following parameters: carpet or timer logic, single or dual door, normal operation or 2S logic, bifold sensor logic, normal back check or large back check, "MAGIC-TOUCH" on/off.

E. The MAGIC-TOUCH feature shall allow door activation by manual action without the need for an approach sensor.

F. A "soft-start" "soft-stop" motor driving circuit shall be provided for smooth normal opening and recycling, thus minimizing loosening of doors, pivots, and frames.

G. A one second reverse-on-obstruction feature shall be provided to reverse door motion if an obstruction is met during door opening or closing.

H. A cam actuated emergency breakout switch shall be provided to disconnect power to the motor when an in-swinging door is manually pushed in the emergency out direction. The operator will then automatically reset and power will be resumed.

I. Fully adjustable opening speed and opening check speed. Control circuitry shall include a 0-30 second adjustable time delay.

J. Provide an internal transformer/power supply for SU-050 approach sensor and Sentrex safety sensors.

K. Provide a "safety plus" - 1.5 seconds extension of both operate and safety signals after pressure has been removed from the control mats.

L. A safety carpet check feature shall monitor the safety carpet activation on every open cycle. If a safety carpet shall fail "open", the door shall be held open for 12 seconds as a signal to the owner that there is a problem.

M. Provide optional power-close accessory, provide optional closing speed control.



### **III. PART THREE      EXECUTION**

#### **3.01 INSPECTION:**

A. The door installer shall verify that the installation area is dry, clean and free of foreign matter. Check as-built conditions and verify the manufacturer's details for accuracy to fit the wall assembly prior to fabrication. Report in writing to the Contractor any detrimental conditions to the proper functioning of the swinging door operator and correct prior to any installation in accordance to the manufacturer's recommendations.

#### **3.02 INSTALLATION OF SWINGING DOOR OPERATOR:**

A. Installation shall be by an installer approved and trained by the manufacturer in strict accordance with the manufacturer's instructions and fire marshall's listing requirements.

B. Comply with the automatic swinging door operator system manufacturer's recommendations and/or installation guide when installing the automatic swing door operator. Set all units plumb, level and true.

C. Provide all fasteners required for installation of the automatic door operator.

D. Adjustment and Cleaning: After repeated operation of the completed installation, re-adjust door operators and controls for optimum operating condition and safety. Clean all metal surfaces promptly after installation.

E. Explain and review the Daily Safety Check Procedure.

#### **END OF SECTION**

## **SECTION 08 80 50 - GLASS AND GLAZING**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Glass and glazing for glazed aluminum systems, hollow metal work, windows, skylights, and doors.
- .2 Free standing engineered structural glass low partitions
- .3 Glazed screen to baggage conveyor.
- .4 Mirrors for washrooms except for framed premade mirrors in accessible washrooms.

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 07 26 00 - Vapour Retarders.
- .3 Section 07 27 00 - Air Barriers.
- .4 Section 07 92 00 - Joint Sealants: Sealant and back-up material.
- .5 Section 08 13 13 - Metal Doors and Frames: Glazed doors.
- .6 Section 08 44 13 - Glazed Aluminum Systems: Glazed frames.

#### **1.3 REFERENCES**

- .1 ANSI Z97.1-04e1 - Safety Glazing Materials Used in Buildings – Safety Performance Specifications and Methods of Test.
- .2 ASTM C542-05 - Specification for Lock-Strip Gaskets.
- .3 ASTM C864-05 - Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- .4 ASTM C920-08 - Elastomeric Joint Sealants.
- .5 ASTM C1036-06 - Flat Glass.
- .6 ASTM C1048-04 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
- .7 ASTM C1172-09 - Laminated Architectural Flat Glass.
- .8 ASTM C1193-09 - Use of Joint Sealants.
- .9 ASTM D412-06ae2 -Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.
- .10 ASTM D1149-07 - Test Method for Rubber Deterioration - Surface Ozone Cracking in a Chamber.
- .11 ASTM D2240-05 - Test Method for Rubber Property - Durometer Hardness.
- .12 ASTM E84-09c - Test Method for Surface Burning Characteristics of Building Materials.

- .13 ASTM E283-04 - Test Method For Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.
- .14 ASTM E330-02 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- .15 CAN/CGSB 12.1-M90 - Tempered or Laminated Safety Glass.
- .16 CAN/CGSB 12.2-M91 - Flat, Clear Sheet Glass.
- .17 CAN/CGSB 12.3-M91 - Flat, Clear Float Glass.
- .18 CAN/CGSB 12.8-97 - Insulating Glass Units.
- .19 CAN/CGSB 12.10-M76 - Glass, Light and Heat Reflecting.
- .20 CAN/CGSB 12.20-M89 - Structural Design of Glass for Buildings.
- .21 CGSB 19-GP-5M-1984 - Sealing Compound, One Component, Acrylic Base, Solvent Curing (Incorporating Amendment No. 1)
- .22 GANA (Glass Association of North America)
  - .1 Glazing Manual (2004).
  - .2 FGMA Sealant Manual.
  - .3 Laminated Glazing Reference Manual (2006).
- .23 IGMAC (Insulating Glass Manufacturers Association of Canada) - Sealed Insulating Glass: Certification Program.
- .24 IGMA (Insulating Glass Manufacturers Alliance).
- .25 LSGA (Laminators Safety Glass Association) Laminated Glass Design Guide 2000.

#### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Provide glass and glazing materials for continuity of building enclosure, vapour retarder and air barrier:
  - .1 In conjunction with materials described in Division 7 and 8.
  - .2 To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapour retarder seal.
  - .3 To maintain a continuous air barrier and vapour retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.
- .2 Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as measured to ASTM E330.
- .3 Where applicable, including but not limit to structural double glazed system, design glass, glazing channels, connections, attachments and glazing accessories to withstand loads designated by the BC Building Code and to accommodate all building deflections.
- .4 Design shall be prepared, signed and sealed by a Structural Engineer specializing in glazing systems and registered in BC.
- .5 Glazing System is required to withstand jet blast of a 737 using apron break away thrust.
- .6 Limit glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.
- .7 Meet CGSB standards for float, tempered and laminated units. Type, thickness to conform to BC Building Code 2012. Use tempered glass on all locations unless otherwise noted.

- .8 Minimum Energy efficiency standards: BC Energy Efficiency Regulations require the following maximum heat rate (U-Value): 2.57 W/(m<sup>2</sup>.k)

### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Refer to Section 01 31 00: Project management and coordination procedures.
- .2 Pre-installation Meetings: Convene one (1) week before starting work of this section.

### **1.6 SUBMITTALS FOR REVIEW**

- .1 Refer to Section 01 33 00: Submission procedures.
- .2 Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- .3 Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colours.
- .4 Insulated glazed unit sample of specified glazing.

### **1.7 SUBMITTALS FOR INFORMATION**

- .1 Refer to Section 01 33 00: Submission procedures.

### **1.8 CLOSEOUT SUBMITTALS**

- .1 Refer to Section 01 78 10: Submission procedures.

### **1.9 QUALITY ASSURANCE**

- .1 Perform Work in accordance with GANA Glazing Manual, GANA Sealant Manual, GANA Laminated Glazing Reference Manual.
- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience.

### **1.10 ENVIRONMENTAL REQUIREMENTS**

- .1 Do not install glazing when ambient temperature is less than 10 degrees C (50 degrees F).
- .2 Maintain minimum ambient temperature before, during and twenty-four (24) hours after installation of glazing compounds.

### **1.11 WARRANTY**

- .1 Refer to Section 01 78 10: Warranties.
- .2 Provide a ten (10) year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.
- .3 Provide a ten (10) year warranty to include coverage for delamination of laminated glass and replacement of same.

## **PART 2 - Products**

### **2.1 FLAT GLASS MATERIALS**

- .1 For sizes and locations of all lites, refer to all elevation drawings and schedules.
- .2 All glass and glazing support systems require to be engineered by a BC licensed engineer. Glass types and thicknesses to be determined by the bidder's engineer.
- .3 Free standing structural glazed low partitions shall be engineered complete with anchorings and concealed reinforcements to the floor, refer architectural drawings.
- .4 Thickness of Glass: Conform to / or exceed Can/CGSB 12.20-M89 and BC Building Code wind load requirements where applicable and according to maximum glass sizes. Thicknesses indicated and specified are minimum only, thicker glass maybe required to meet structural requirements.
- .5 Glazing System is required to withstand jet blast of a 737 using apron break away thrust on airside. Airside glass is required to be laminated/tempered on the outside light
- .6 

Glazing to the front of the Baggage Tunnel shall be 3form: Varia Ecoresin 19mm, Finish:Spa Emboss Sandstone F01, Style: pa+Ghost W03 (Add 3)
- .7 Safety (tempered) glass: to CAN/CGSB-12.1, clear, 6 mm minimum thickness.
  - .1 Type 2, Tempered.
  - .2 Class: B-float.
- .3 Substitutions: Refer to Section 01 62 00.

### **2.2 SEALED INSULATING GLASS MATERIALS**

- .1 Insulating glass units: to CAN/CGSB-12.8, double unit, 25 mm overall thickness.
  - .1 Glass: Safety tempered glass to CAN/CGSB-12.3 and CAN/CGSB-12.1.
  - .2 Glass thickness: Thickness as engineered.
  - .3 Inter-cavity space thickness: 12.7 mm with low conductivity spacers.
  - .4 Glass coating: surface number #2.
  - .5 Inert gas fill: Argon.
- .2 Spacer shims: Neoprene or Silicone, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self-adhesive on one face.

### **2.3 GLAZING COMPOUNDS**

- .1 Glazing tape:
  - .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; black colour.
  - .2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2%, designed for compression of 25%, to effect an air and vapour seal.

### **2.4 GLAZING ACCESSORIES**

- .1 Glazing splines: resilient silicone, extruded shape to suit glazing channel retaining slot, black colour.

- .2 Glazing clips: manufacturer's standard type.
- .3 Lock-strip gaskets: to ASTM C542.
- .4 Setting blocks: Neoprene, EPDM, or Silicone, 80-90 Shore A durometer hardness to ASTM D2240, length of 25 mm for each square meter of glazing.
- .5 Spacer shims: Neoprene or Silicone, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self-adhesive on one face.

## **2.5 GLAZING FILM**

- .1 Acceptable product for Interior glazing film: Lintec Mistlass MST 5001 White Mist, or approved equal with the following properties:
  - Visible Light Transmission – VLT 71%
  - UV Light Transmission <1%
  - Total Energy Transmission 68%
  - Visible Light Absorption 16%
  - Shading Coefficient .83%
  - Material Multi-ply Polyester
  - Surface Texture Matte
  - Adhesive Pressure Sensitive

## **PART 3 - Execution**

### **3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that openings for glazing are correctly sized and within tolerance.
- .3 Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

### **3.2 PREPARATION**

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.
- .4 Install sealant in accordance with manufacturer's written instructions.

### **3.3 INSTALLATION - EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)**

- .1 Cut glazing tape to length and set against permanent stops, 5 mm (3/16 inch) below sight line. Seal corners by butting tape and dabbing with butyl sealant.
- .2 Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapour seal.

- .3 Place setting blocks at 1/4 points with edge block no more than 150 mm (6 inches) from corners. Do not block drainage openings.
- .4 Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.
- .5 Install removable stops, with spacer strips inserted between glazing and applied stops, 6 mm (1/4 inch) below sight line.
- .6 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, but not more than 10 mm (3/8 inch) below sight line.
- .7 Apply cap bead of <Insert Option> type sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

### **3.4 FIELD QUALITY CONTROL**

- .1 Refer to Section 01 45 00: Field testing.
- .2 Inspection will monitor quality of glazing.

### **3.5 CLEANING**

- .1 Section 01 74 00: Cleaning installed work.
- .2 Remove glazing materials from finish surfaces.
- .3 Remove labels after Work is complete.
- .4 Clean glass and adjacent surfaces.

### **3.6 PROTECTION OF FINISHED WORK**

- .1 Refer to Section 01 78 40: Protecting installed work.
- .2 After installation, mark pane with an 'X' by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.

### **3.7 SCHEDULE**

- .1 Aluminum Doors:
  - .1 Exterior Entrances: Sealed glass unit doors and sidelights. 6 mm exterior tempered lite with high performance coating to #2 surface; 6 mm clear tempered interior lite.
  - .2 Interior Vestibules: Single 6 mm clear tempered safety glazing.
- .2 Glazed Aluminum Systems:
  - .1 Vision glass: Sealed glass units 6 mm exterior tempered lite with high performance coating to #2 surface; 6 mm clear annealed float interior tempered lite.
  - .2 Interior vestibule: 6 mm clear tempered lite.
- .3 Structural Free Standing Low Partitions
  - Engineered 19mm clear complete engineered floor support
- .4 Conveyor Facing
  - 3FORM

**END OF SECTION**



## **SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES**

### **PART 1 - GENERAL**

#### **1.1 SECTION INCLUDES**

- .1 Gypsum board, plain, abuse resistant and fire rated, to walls and ceilings, fastenings and finishing.
- .2 Finishing of gypsum board, i.e. taping, filling and sanding
- .3 Metal furring channels and resilient channels.
- .4 Metal framing of suspended ceilings and bulkheads.
- .5 Exterior Sheathing Board
- .6 Sheathing board under tile in wet areas

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 57 13 - Construction Activity Pollution Prevention.
- .3 Section 01 74 20 - Waste Management and Disposal.
- .4 Section 05 41 00 – Structural Metal Lightweight
- .5 Section 06 10 00 - Wood Framing: Building wood framing system and backings.
- .6 Section 07 21 16 - Blanket Insulation: Thermal and Acoustic insulation.
- .7 Section 07 26 00 – Vapour Retarders: Vapour retarder materials.
- .8 Section 07 84 00 – Firestopping: Sealing of penetrations in fire separations.
- .9 Section 08 11 13 – Metal Doors and Frames: Adjacent work.
- .10 Section 08 31 13 - Access Doors and Frames: Metal access panels and frames.
- .11 Section 08 44 13 – Glazing Systems: Adjacent work.
- .12 Section 10 44 13 – Fire Extinguisher Cabinets: Adjacent work.

#### **1.3 REFERENCES**

- .1 ASTM C475/C475M-02 (R2007) - Joint Compound and Joint Tape for Finishing Gypsum Board.
- .2 ASTM C514-04(2009)e1 - Nails for the Application of Gypsum Board.
- .3 ASTM C557-03(2009)e1 - Adhesives for Fastening Gypsum Wallboard to Wood Framing.
- .4 ASTM C840-08 - Application and Finishing of Gypsum Board.
- .5 ASTM C1002-07 - Steel Self-Piercing, Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- .6 ASTM C1047-09 - Accessories for Gypsum Wallboard and Gypsum Veneer Base.
- .7 ASTM C1396/C1396M-09a - Gypsum Board.

- .8 ASTM E90-09 - Test Method for Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions and Elements.
- .9 CAN/CGSB-71.25-M88 - Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.
- .10 CAN/ULC-S101-07 - Methods of Fire Endurance Tests of Building Construction and Materials.
- .11 CAN/ULC-S102-07 - Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .12 CAN/ULC-S702-09 - Thermal Insulation Mineral Fibre for Buildings.
- .13 GA-214-07 (Gypsum Association) - Recommended Levels of Gypsum Board Finish.
- .14 GA-216-07 (Gypsum Association) - Application and Finishing of Gypsum Panel Products.
- .15 GA-600-09 (Gypsum Association) - Fire Resistance Design Manual.
- .16 GA-801-07 (Gypsum Association) - Handling and Storage of Gypsum Panel Products: A Guide for Distributors, Retailers, and Contractors.
- .17 ULC - Fire Resistance Directory.

#### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Acoustic Attenuation for Identified Interior Partitions: STC as indicated to ASTM E90.
- .2 Coordinate installation of backing material for wall fastened and supported products and systems. Do not install gypsum board products without having performed coordination.
- .3 Works of this section shall conform to the Association of Wall & Ceiling Contractor of BC (AWCC) and BC Wall and Ceiling Association.
- .4 Provide anchorage and reinforcing to meet code requirements including seismic restraint shall be this subcontractor's responsibility.

#### **1.5 SUBMITTALS FOR REVIEW**

- .1 Refer to Section 01 33 00: Submission procedures.
- .2 Product Data:
  - .1 Provide data on metal framing, gypsum board, cementitious backer board, joint tape, joint compound and accessories.
- .3 Shop Drawings: Indicate structural design for wind, seismic and axial loads per BCBC-2006.
  - .1 Submit Engineered Shop Drawing signed and sealed by a qualified Engineer registered to practice in the province of British Columbia.
  - .2 Submit Structural Schedule S-B prior to fabrication of this Work, and Structural Schedule S C-B on completion of Work and prior to request for Substantial Performance of Contract.
  - .3 Indicate materials, core thicknesses, profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

#### **1.6 SUBMITTALS FOR INFORMATION**

- .1 Refer to Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements.

## 1.7 CLOSEOUT SUBMITTALS

- .1 Refer to Section 01 78 10: Submission procedures.

## 1.8 QUALITY ASSURANCE

- .1 Perform Work in accordance with ASTM C840, GA-214, GA-216, GA-600. Maintain one (1) copy on site.
- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum ten (10) years documented experience.
- .3 Handling Gypsum Board: Comply with GA-801.
- .4 **Only one (1) final third party inspection agency inspection need be provided. (PTA-1)**

## 1.9 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for fire-rated assemblies as follows:
  - .1 Fire Rated Assemblies: ULC or Intertek (Warnock Hersey) Listed Design Assemblies and in conformance with BCBC.

## PART 2 - PRODUCTS

### 2.1 INTERIOR GYPSUM BOARD AND TILE BACKER BOARD

- .1 Typical GWB - Painted: Generally 16 mm (5/8") thickness throughout unless specifically noted otherwise. Typical walls and ceilings to be ProRoc Wallboard by BPB. Fire rated to suit wall and ceiling types and to provide required fire rating, in single or multiple layers 1220 mm wide, in lengths as long as practical to minimize end joints. Where required, use fire rated board type "X" ULC meeting CAN/CSA-A82.27-M91.
- .2 Utilize 16 mm (5/8") type "X" board behind all wall mounted wood trim.
- .3 Typical WC - Painted: Utilize "DensArmor Plus Paperless Interior Panels" by Georgia Pacific.  
**Sheetrock Glass Mat Mold Tough; is APPROVED as an acceptable alternate (ADD 2)**
- .4 Typical WC – Tiled: Utilize "Dens-Shield Tile Backer by Georgia-Pacific. Approved Alternate: Diamondback Tile Backer by CertainTeed Gypsum Canada Inc.  
**CGC Durock Brand GlassMat Tile Backerboard; is APPROVED as an acceptable alternate (ADD 2)**
- .5 Abuse Resistance Board: Utilize "Tough Rock Abuse Resistant" by Georgia Pacific. Approved Alternate: ProRoc Extra Abuse Type X with M2  
**TechSheet rock Abuse Resistant; is APPROVED as an acceptable alternate (ADD 2)**

### 2.2 EXTERIOR GYPSUM SHEATHING BOARD

- .1 Exterior Wall sheathing board: to ASTM C1177/C1177M and as follows:
  - .1 Type: regular and fire resistant as scheduled.
  - .2 Size: 1200 mm x maximum practical length.
  - .3 Thickness: as indicated on Drawings.
  - .4 Edges: square.
  - .5 Acceptable materials:
    - .i Dens-Glass Gold, Georgia-Pacific Canada, Inc.
    - .ii Securock Glass Mat Sheathing, CGC Inc.
    - .iii GlasRoc Exterior Sheathing, Certain Teed.

## **2.3 SHAFT WALL**

- .1 Where shown utilize proprietary shaft wall construction conforming to fire-resistance and acoustical ratings as shown on the drawings.

## **2.4 ACCESSORIES AND SPECIALTIES FOR DRYWALL**

- .1 Gypsum Board Screws: Conforming to ASTM C1002 , self-drilling, self-threading case hardened screws with Phillips type head (bugle head). On screwable steel studs and furring drywall screws shall have a minimum penetration of 12.7 mm (1/2"), as follows:

Single Layer:	12.7 mm (1/2")	#6 screw 25.4 mm (1")
	15.9 mm (5/8")	#6 screw 28.6 mm (1 1/8") or 31.8 mm (1 1/4")
Double Layer:	12.7 mm (1/2")	#7 screw 41.3 mm (1 5/8")
	15.9 mm (5/8")	#7 screw 47.6 mm (1 7/8")
- .2 Joint Treatment Materials:
  - .1 Gypsum Board Tape: 50 mm (2") spark perforated paper tape, of type recommended by manufacturer of gypsum board products.
  - .2 Gypsum Board Jointing Compound: Casein, vinyl or latex base; slow setting; low shrinkage, low VOC, noncombustible bedding and finishing compounds of type recommended by manufacturer of gypsum board. Special mixes for filling and finishing.
  - .3 Water: Fresh, clean, potable, free from deleterious matter or alkalis.
- .3 Wallboard Adhesive: Low VOC, laminating adhesive for laminating gypsum board to gypsum board, gypsum board to rigid insulation and gypsum board to concrete and/or masonry shall be of a type specially formulated for the intended purpose and as commercially available.
- .4 Corner and Casing Beads, "L" and "Z" reveal molding and ceiling trim as detailed: Suit requirements of drywall conditions. Corner beads, cornerite, etc., to be fabricated from galvanized sheet steel, not less than 26 US gauge, with perforated or expanded metal flanges. Stops and corner beads to be square type. Only fillable type J or L beads are acceptable. All accessories to be concealed on the finished work.
- .5 Access Doors: Coordinate with Mechanical to avoid duplication.
  - .1 At all location where possible utilize Acudor DW-5040, size as noted on Mechanical and/or Electrical drawings.
  - .2 At location where DW-5040 is not possible utilize Acudor UF-5000, size as noted on Mechanical and/or Electrical drawings.
- .6 Steel Sheet Backing for future washroom grab bars and custom SS handrail.
- .7 Polyethylene guard: 12mm thick polyethylene as shown on drawings for wall guard on, but not limited to partition types P10, P13. Provide sample as per item 3.8.3 in this section.

## **2.4 ACOUSTIC CONTROL COMPONENTS**

- .1 Acoustic Batt Insulation: fibrous rock wool insulation for fire and smoke rated assemblies, un- faced preformed GreenGuard™ or formaldehyde free binder fibrous insulation meeting the requirements of ULC S702; having maximum flame spread and smoke developed of 0/0 in accordance with CAN/ULC S102 and being non-combustible in accordance with CAN/ULC S114 and as follows:
  - .1 Width: to friction fit in stud spaces.
  - .2 Thickness: to full cavity thickness.
  - .3 Nominal density: 40 kg/m3.
  - .4 Acceptable Material: Safe'n'Sound; Roxul.
- .2 Acoustic Caulking: Synthetic rubber acoustic sealant meeting CAN/CGSB 19.21-M87. Tremco acoustic sealant, or approved equivalent matching VOC limits where applicable.

- .3 Foam Tape: Self-adhesive closed cell, 6 mm x 25 mm (1/4" x 1") neoprene and/or polyvinyl chloride. Westex, NW1P or approved equivalent.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- .1 Prior to installation of gypsum board products, ensure backing required for wall fastened and wall supported products and systems are installed in correct place.
- .2 Prior to commencement of work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- .3 Do not apply drywall unless the work which is to receive it and site conditions are SATISFACTORY, and the temperature of the building is 12oC to 21oC maximum for 72 hours prior, during, and after application.
- .4 Avoid concentrated or irregular heat during drying. Provide ventilation to dry gypsum drywall fillers properly.
- .5 Partitioning systems go to underside of structural or beam elements unless specifically detailed otherwise.

### **3.2 INSTALLATION OF GYPSUM BOARD AND WALLS/PARTITIONS**

- .1 Drywall partition types are designated on the drawings in accordance with wall types listed in the Wall Types Schedule. Fire resistance rated walls and ceilings (where applicable): Comply with installation requirements of testing agency for wall and ceiling systems detailed on drawings in addition to these specifications.
- .2 GWB generally 16 mm (5/8") thickness, unless noted otherwise, single and double layer applications. Refer to Arch. Dwg. A0.01 Assemblies. Gypsum wallboard shall be erected by workers skilled in this trade, in strict accordance with the manufacturer's directions, to requirements of CSA Specification A82.31-M1980. Apply at right angles to studs, or vertically with joints located over studs or furring members for fire-rated assemblies, butting edges to moderate contact in as long lengths of board as practical to minimize end joints. Stagger all end joints and support on framing members, space Type S screws fasteners at 300 mm (12") o.c. starting at the centre of the sheet and working toward the ends. Maintain a minimum of 10 mm (3/8") from edges and ends of panels to screws. Apply trim in accordance with the manufacturer's recommendations.
- .3 Laminated (Two Layer Application Fireproofing): Apply at right angles or parallel with first layer to suit fire rating, taking care to offset or stagger joints. Laminate panels using adhesive or joint filler method to provide fire-rated assemblies and in strict accordance with the manufacturer's recommendations. Use screws in conjunction with adhesive or joint laminating compound. Locate joints over framing members.
- .4 Partitions shall extend from floor to underside of structure over unless indicated and/or listed otherwise. All ceilings shall be minimum of 12.7 mm (1/2") gypsum board unless otherwise noted.
- .5 Install gypsum board to avoid butt-end joints if possible to reduce the amount of joint finishing.
- .6 Do not locate joints on same stud on opposite sides of partitions. Stagger end joints occurring on same side of partitions.
- .7 Keep vertical joints at least 300 mm (1'-0") from the jamb lines of door, window and other openings.
- .8 Cut sheets to fit accurately; do not force into place. Remove ragged edges or burrs with rasp or sandpaper.
- .9 Cut and fit of gypsum board to accommodate recessed items in partitions and/or furring.
- .10 Allow deflection spaces between drywall partitions and building structural framing components to allow for movement of framing components.
- .11 Box-in electrical, telephone and data outlets in fire-rated walls with drywall, typical.

- .12 Increase if necessary, depth and width of all furrings, bulkheads, chases, etc. to contain and conceal electrical and heating risers, rainwater leaders, plumbing wastes, hot and cold water supplies and provide gypsum board concealment to all pipes in visually exposed heated spaces. Check mechanical, plumbing and electrical drawings for extent of piping and conduits.
- .13 Adhesive Application (if required) - Gypsum Board to Concrete: Apply adhesive to back of wallboard using method recommended by adhesive manufacturer. Erect wallboard immediately and press firmly into place. Drive supplementary concrete nail fasteners to hold wallboard in place until adhesive has set. Allow at least 24 hours for adhesive to set before taping and finishing wallboard.
- .14 Provide duct enclosures to meet fire ratings as required by the BC Building Code.

### **3.3 INSTALLATION of GWB DRYWALL CEILINGS**

- .1 Gypsum Panel Erection: Apply gypsum panels of maximum practical length with long dimension at right angles to furring channels or steel studs. Position end joints over channel web and stagger in adjacent rows. Fur ends and edges closely, but not forced together. Fasten panels to channels with Type S screws spaced 300 mm (12") o.c. in field of panels and along abutting ends and edges.

### **3.4 INSTALLATION OF ACOUSTIC CAULKING**

- .1 Install acoustic caulking to complete periphery of all sound rated walls. All surfaces to be clean, free of dust, and must be cleaned with compressed air or vacuums immediately prior to installation of caulking. Run continuous bead of acoustic caulking at each face of acoustically rated wall assemblies.
- .2 Seal perimeter joints between partition and all pipes and ducts that pass through drywall partitions, with sealant as specified.
- .3 Acoustic sealant is specified in installation of steel stud and track and shall be used at all wall construction and as detailed. Coordinate to ensure satisfactory installation.

### **3.4 INSTALLATION OF DRYWALL ACCESSORIES**

- .1 Corner and Casing Bead: Select to suit GWB requirements and details. Install as detailed to all reveals, external angles or corners and junctions where drywall abuts other materials as detailed on the drawings. Installation shall be in strict accordance with the manufacturer's instructions.
- .2 Access Panels: Install in all locations as required to provide access to mechanical controls (dampers, valves, etc.). Coordinate finish and fire rating to suit wall types. Access panels will be supplied by Mechanical Divisions 21-22-23.

### **3.5 SPECIAL SHEATHING BOARD AND TILE BACKER BOARD**

- .1 Install sheathing board and backer board in conformance with the manufacturer's printed instructions, the requirements of the fire rated testing authority and as a minimum standard to installation of gypsum wall sheathing specifications of BCWC Manual and as specified herein for gypsum wall sheathing. Taping and filling of joints shall be in accordance with the manufacturer's recommendations using special manufacturer's recommended tapes.

### **3.7 FINISHING**

- .1 Finish gypsum wallboard in accordance with Level 1 for areas totally concealed from view in the finished work including partitions above ceilings to underside of structure above.
  - .1 Level 4 for surfaces to receive vinyl wall covering, flat or low gloss finishes, ceilings, and storage and other designated non public areas. (Refer to Section 09 90 00.)
  - .2 Level 5 for surfaces in public areas and surfaces to receive semi-gloss or gloss finishes, except as noted above.
- .2 Use finishing techniques that minimize the amount of sanding, such as finishing with a wet sponge.

- .3 Joints in partitions carried above ceilings and where scheduled shall be taped and filled only.
- .4 Rooms without Base Mould or Trim: Finish gypsum board joints to floor slab.

**3.8 PROTECTION AND CLEAN-UP**

- .1 Protect the work of other trades from damage resulting from the work of this section.
- .2 All rubbish and surplus materials resulting from the work of this section are to be promptly cleaned up and removed from the premise as work proceeds and at completion.

**END OF SECTION**

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**PART 1      GENERAL**

**1.1      WORK INCLUDED**

- .1      Metal support systems for walls and furring.
- .2      Fire rated assemblies enclosing mechanical and electrical services.
- .3      Engineering by Trade Contractor.

**1.2      RELATED WORK**

- .1      Section 01 33 00 Submittal Procedures
- .2      Section 01 35 43 Environmental Procedures
- .3      Section 01 74 19 Construction Waste Management
- .4      Section 05 50 00 Metal Fabrications & Ornamental Metals
- .5      Section 06 10 00 Rough Carpentry
- .6      Section 07 21 00 Building Insulation and Poly Vapour Barrier
- .7      Section 09 21 16 Gypsum Wallboard & Exterior Sheathing Systems
- .8      Section 10 28 13 Toilet and Bath Accessories
- .9      Divisions 21-22-23 (by Mechanical)

**1.3      ADMINISTRATIVE REQUIREMENTS**

- .1      Coordinate installation of backing material for wall fastened and supported products and systems.

**1.4      QUALITY ASSURANCE**

- .1      Work of this section shall conform to the Association of Wall & Ceiling Contractors of B.C. (AWCC) Specifications Standards Manual (2012 Edition), also endorsed by the B.C. Wall and Ceiling Association (BCWC).

**1.5      PRODUCT DELIVERY, STORAGE AND HANDLING**

- .1      Deliver and store all materials undamaged in original wrappings or containers, with manufacturer's labels and seals intact.



- .2 Steel studs, carrying and furring channels, lath, and accessory items shall be protected from dampness and damage, stored under cover, off floor, on wood supports or pallets.

## **1.6 DESIGN RESPONSIBILITY**

- .1 It is a requirement of this Section that all stud partitions and walls be designed to accommodate building deflections as shown on structural drawings or if not shown span/360.
- .2 It is the responsibility of this section to design steel studs and furring to Interior walls that support structural glazing and self-supporting materials other than drywall and all seismic restraint to meet all applicable codes.
- .3 Submit confirmation signed and sealed by a Structural Engineer registered in the province of British Columbia that all of the above requirements have been met.
- .4 Provide letter of confirmation on completion of installation of the Work of this section that it has been fabricated and installed in accordance with the requirements of all codes. Letter to be signed and sealed by a Professional Engineer registered in the Province of British Columbia.

## **1.7 SUBMITTALS**

- .1 Shop Drawings:
  - .1 Submit Engineered Shop Drawings in accordance with Section 01 33 00; The Professional Engineer responsible for the Shop Drawings shall inspect the installation of the work for conformance with his design and the shop drawings and shall upon completion of the work, provide to the Consultant certification of substantial conformance of the work with the drawings and contract documents.
- .2 Trade Contractor's engineer to provide Schedules to Registered Professional of Record (RPR):
  - .1 S-B, Assurance of Professional Design and Commitment for Field Review by Supporting Registered Professional (SRP).
  - .2 S-C, Assurance of Professional Field Review and Compliance by Registered Professional (SRP).

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 General: All materials used in this contract shall be of the highest quality as manufactured by nationally recognized manufacturers and of the type indicated on the drawings and in this specification.

- .2 Steel studs shall have a minimum recycled content of 50%.
- .3 All components used in fire rated assemblies shall be in accordance with the applicable ULC, Warnock Hersey, or B.C. Building code Appendix D listed assembly.

## **2.2 INTERIOR PARTITION COMPONENTS**

- .1 All steel studs shall be "Ecologo Studs" by Dofasco with a minimum recycled content of 50%. Other steel studs will be considered only if they meet or exceed 50% recycled content.
- .2 Steel Stud, Track, and Furring: Manufactured from minimum 0.53 mm (25 ga.) light weight unless otherwise noted, electro zinc coated sheet steel, 'C' shape with knurled faces on flanges or legs, and knock-out pass through holes in web. Profiles, size, and spacing shall be as shown on the drawings.
- .3 At walls where special sheathing board and tile backer boards are to be attached, the stud system must be designed and sized such that deflections in excess of L/360 do not occur under any anticipated loading. The minimum stud system should in no case consist of less than 0.91mm (20 ga.) steel studs, 400mm o.c. (or as otherwise required by sheathing board manufacturer).
- .4 At shaft walls utilize proprietary framing components to conform to the requirements of the fire- resistance and acoustically tested assembly.

## **2.3 LOAD BEARING STEEL STUDS**

- .1 As recommended by an engineer registered in British Columbia. Utilize heavy gauge deep leg deflection track to accommodate deflection.

## **2.4 SUSPENSION SYSTEMS (DRYWALL CEILINGS ONLY)**

- .1 Suspension for other ceiling material, refer to Section 09 51 00 for Acoustic Ceiling Tile and Section 09 51 20 Wood Acoustic Ceiling Panel
- .2 Hangers: Hangers supporting main runners of suspended ceilings shall be galvanized wire; diameter zinc coated or cadmium plated steel round rods with rust inhibitive coating. Type of wire used shall conform to the following table:

<u>AREA SUPPORTED</u>	<u>MAXIMUM DIAMETER OF HANGERS</u>
Up to 1.15 m2 (12.5 sq. ft.)	3.6 mm dia. (9 gauge) wire
Up to 1.48 m2 (16.0 sq. ft.)	4.8 mm (3/16") dia. rods

- .3 Inserts: Inserts shall be able to develop full strength of hangers they support as follows:

<u>SIZE OF HANGER</u>	<u>STRENGTH IN TENSION AT 110 MPA (16,000 LB./SQ. IN)</u>
3.6 mm dia (9 gauge) wire	136 kg (300 lb.)
4.8 mm (3/16") dia. Rods	199 kg (400 lb.)

Inserts shall be of type suitable for attachment to applicable surface.

- .4 Main Runners (carrying Channels)-Ceilings: Cold formed steel channels shall be of dimensions and weight as follows and protected with rust inhibitive coating

Main Runners shall be not less than 38 mm x 12.7 mm x 1.4 mm (1 1/2" x 17 ga). channels.

MAXIMUM SPACING

<u>OF HANGERS</u>	<u>OF MAIN RUNNERS</u>
900 mm (3'-0")	1200 mm (4'-0")
1000 mm (3'-6")	1000 mm (3'-6")
1200 mm (4'-0")	900 mm (3'-0")

- .5 Cross Furring-Ceilings: Cross furring members shall be hat shaped furring channels. The maximum spacing of furring channels shall conform to the following requirements, based on board thicknesses and layers.

<u>BOARD THICKNESS</u>	<u>MAX. FURRING SPACING</u>
Single 12.7 mm (1/2") board	400 mm (16" o.c.)
Single 15.9 mm (5/8") board	600 mm (24" o.c.)
Double layer	400 mm (16" o.c.)

- .6 Tie Wire: Tie wire for attaching furring to main runners of suspended ceilings shall be two strands of 1.21 mm diameter (18 ga.) galvanized soft annealed steel wire.

## **2.5 FURRING**

- .1 Refer to wall types on drawings.

- .2 Walls and Vertical Surfaces: Where required hat shaped or 'Z' bar light gauge steel furring member for screw attachment of stucco wire lath and gypsum wallboard. Roll formed or break shape hot dipped galvanized to G60 for exterior use and a wiped coat zinc coating to ASTM 525 for interior application.
- .3 Resilient furring channel (if required), RC Plus channel as supplied by Bailey Metal Products Ltd. or approved equivalent.

## **2.6 FASTENERS AND ACCESSORIES**

- 1 Steel Stud Partitions or Suspension Systems: Powder activated fasteners, fastener and charge from manufacturer's standard range to suit structural conditions, and fixing requirements and in accordance with manufacturer's recommendations. Ramset, Hilti or approved equivalent.
- .2 Appropriate hand driven or screw fasteners for fastening to framing.
- .3 Screws: Lengths as required to suit applications, self tapping corrosion resistant drywall screws.
- .4 Acoustic Gasket or Tape: Self-adhesive foam tape 6 mm x 25 mm closed cell neoprene and/or polyvinyl chloride.
- .5 Acoustic Caulking: Synthetic rubber acoustic sealant meeting CAN/CGSB 19.21 M87. Tremco acoustic sealant, Grace Acoustic caulk or approved equivalent. Location: to be determined by Consultant.
- .6 Other Acoustic Components: (if required) as noted on drawings.

## **3.1 EXAMINATION**

- .1 Inspect all surfaces prior to commencement of the work of this section. Starting work shall imply acceptance.
- .2 Protect adjoining surfaces against damage resulting from work of this section.

## **3.2 INSTALLATION (STEEL STUD AND TRACK)**

- .1 Unless noted otherwise all partitions shall be full height from floor to underside of structure above. Allow minimum 20 mm for deflections at head.
- .2 Determine partition type and location from drawings, stud spacing, gauge, sizes of built-ins for rough openings, access panels locations and sizes. Erect in strict accordance with the manufacturer's written directions and by workers skilled in this trade to provide plumb, level, and true wall surfaces.

- .3 Install floor and ceiling track seated on two continuous beads of acoustic sealant. Ensure continuity for entire perimeter of acoustically-rated wall assemblies. Fasten securely to concrete at maximum 600 mm o.c. using approved concrete fasteners.
- .4 Install studs to specified centres, cut short at top to allow for necessary deflection allowances. Friction-fit stud in top track and securely fasten with piercing locking tool at both sides of floor track for each stud.
- .5 Install double steel studs at door and window openings by boxing method, back to back, or nesting to suit pressed steel frame condition and provide most stable installation.
- .6 Install channel stiffener above door heads. Stiffener to run to closest stud adjacent to boxed jamb studs.
- .7 Install continuous channel stiffener at mid-point of all stud partitions not exceeding 3.60 meters in height and at third (1/3) points for all partitions exceeding 3.6 meters in height.
- .8 Where studs butt walls of concrete, treat as for floor and ceiling track, installing two continuous strips of foamed tape, lapping tape at all joints to ensure continuity, and fasten to abutting walls using approved fasteners.
- .9 Install plywood backing for electrical, rough openings for building in washroom accessories, mirrors, vanities, light cover reflectors, and access panels supplied and installed by others, or supplied and installed under this section

### **3.3 INSTALLATION (FURRING)**

- .1 Install in vertical or horizontal pattern to suit conditions, centre at 24 inches (600 mm) or 16 inches (400 mm) as required, or detailed to provide solid backing for applications of GWB or plywood backing board.
- .2 All fastening to substrate or structure to be by approved powder-activated or drill-in type fasteners satisfying WCB requirements and recommendations of that manufacturer.
- .3 Install all backing for electrical, washroom accessories, mirrors, and build in chases and openings for access doors and built-ins installed under this section or supplied and installed by others.

### **3.4 INSTALLATION (STUD TYPE SUSPENSION SYSTEMS FOR DRYWALL)**

- .1 General: Install steel stud and track suspension systems in strict accordance with material manufacturer's instruction. Select spacing, size, and gauge of members to suit job conditions of structural configuration, ductwork, piping, and electrical, using tables of allowable sizes for components.
- .2 Framing: Fasten track to vertical wall elements of steel stud, masonry or concrete with drill-in type inserts as specified. Cut and fit framing at maximum 600 mm (24") centres or

as recommended to suit size, gauge, and spans. Multiple spans may be obtained by installing hangers spaced not to exceed span and stud spacing limits. Splice or lap studs at each hanger.

- .3 Reinforcing Backing: Install all backing, framing, and reinforcing as required for installation of fixtures, ducts, diffusers, access panels, grilles, and other items to be built into the work.
- .4 Install isolated ceiling (if required) as detailed and in strict accordance with the isolation manufacturer's recommendations.

### **3.5 CLEAN-UP**

- .1 Promptly as work proceeds and at completion, clean up and remove from premises all

**END OF SECTION**

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**1. General**

**1.1. SCOPE**

- 1.1.1. . Supply and install ceramic wall tiles as shown on the drawings and finish schedules, complete with all trims and accessories as specified herein.

**1.2. REFERENCES**

- 1.2.1. Terrazzo Tile & Marble Association of Canada (TTMAC): Tile Specification Guide 09300/2002.
- 1.2.2. Terrazzo, Tile and Marble Association of Canada 2000 Maintenance Guide.

**1.3. SUBMITTALS**

- 1.3.1. Submit four copies of TTMAC Maintenance Guide for inclusion in the operations and maintenance manual prepared and submitted in Section 01001. Give specific warning of any maintenance practice or materials that may damage or disfigure the finished work.
- 1.3.2. Submit product data and WHMIS MSDS sheets for floor sealer products.
- 1.3.3. Where more than one manufacturer's products are part of a single tile assembly, arrange for each manufacturer to submit a written statement of compatibility with respect to the other manufacturers' materials.

**1.4. QUALITY ASSURANCE**

- 1.4.1. Installer: Employ skilled mechanics trained and experienced in tile work, company must be registered as members in good standing with the Terrazzo, Tile and Marble Association of Canada, with a minimum of two years [proven] experience. If requested by Consultant, submit a listing of at least three previously completed projects of similar size and scope.

- 1.4.2. Supplier: A member in good standing with the Terrazzo, Tile and Marble Association of Canada, providing materials meeting the minimum standards of TTMAC.

1.5. ENVIRONMENTAL  
CONDITIONS

- 1.5.1. Do not install tiles at temperatures less than 12 degrees C or above 38 degrees C
- 1.5.2. Maintain temperatures at or above 12 degrees C until cementitious materials have fully cured.
- 1.5.3. Do not apply epoxy mortar and grouts at temperatures below 18 degrees C or above 35 degrees C

1.6. DELIVERY STORAGE AND  
HANDLING

- 1.6.1. Store materials in a dry area, protected from freezing, staining and damage.
- 1.6.2. Store cementitious materials on a dry surface.

1.7. EXTRA MATERIALS

- 1.7.1. Provide extra stock to 2 percent, whichever is the greater, of each type and colour of tile; clearly marked to identify:
  - 1.7.1.1. Manufacturer's name
  - 1.7.1.2. Product's name
  - 1.7.1.3. Product colour and pattern
  - 1.7.1.4. Package tile products neatly in original containers, to prevent damage.

**2. PRODUCTS**

2.1. TILE MATERIALS

- 2.1.1. Ceramic Wall and Floor Tile:

Niro Granite – NuStone Series by Centura; is  
**APPROVED** as an acceptable alternate (Add 3)



2.1.1.1.MODA DESIGN TILE COLLECTION:  
KRONOS SERIES

2.1.1.2.Colour Black

2.1.1.3.Matte Finish

2.1.1.4.Size 12 x 24

2.1.1.5.Through body porcelain-rectified.

2.1.1.6.Distributed by AMES.

Distributed by Centura Tile; is **APPROVED** as  
an acceptable alternate (Add 3)

2.1.2. Tile grout colour to match tile colour .

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2.2. MORTAR, ADHESIVE AND  
GROUT MATERIALS

- 2.2.1. Portland Cement: to CAN/CSA-A5, Type 10.
- 2.2.2. Hydrated Lime: to ASTM C207
- 2.2.3. Sand: to ASTM C144, passing 16 mesh.
- 2.2.4. Dry-Set Portland Cement Mortar: to ANSI A118.1.
- 2.2.5. Latex-Portland Cement Mortar: to ANSI A118.4.
- 2.2.6. Commercial Portland Cement Grout: to ANSI A118.6.
- 2.2.7. Latex-Portland Cement Grout: to ANSI A118.6.
- 2.2.8. Polymer Modified Grout: to ANSI A118.7
- 2.2.9. Epoxy Adhesive and Grout: to ANSI A118.3.
- 2.2.10. Modified Epoxy Emulsion Mortar: to ANSI A118.8
- 2.2.11. Furan Mortars and Grout: to ANSI A118.5.

2.3. ACCESSORIES

- 2.3.1. Latex Additive: formulated for use in Portland cement mortars and grouts.
- 2.3.2. Water: potable, clean and free of chemicals and contaminants detrimental to mortar or grout mixes.
- 2.3.3. Transition Strips: purpose made metal extrusion; anodized aluminium Schluter type. For all outside corners, and any vertical or horizontal exposed tile edges.

For floor to wall cove transitions: Schluter cove-shaped profile DILEX-AHK

- 2.3.4. Reducer Strips: purpose made metal extrusion; anodized aluminium Schluter type maximum slope of 1:2.
- 2.3.5. Prefabricated Movement Joints: purpose made, having a Shore A Hardness not less than 60 and

elasticity of plus or minus 40 percent when used in accordance to TTMAC Detail 301MJ-2002.

2.3.6. Joint Sealant: as recommended by Manufacturer

2.3.7. Sealer: to CAN/CGSB-25.20, Type; as recommended by tile manufacturer.

## 2.4. MIXES

2.4.1. Scratch Coat (by volume): 1 part Portland cement, 4 parts sand, and latex additive where required by TTMAC Detail. Premixed mortar may be used per manufacturer's instructions. Adjust water volume depending on moisture content of sand to obtain consistency and workability.

2.4.2. Slurry Bond Coat: mix Portland cement and water to a creamy paste consistency. Include latex additive where required by TTMAC Detail.

2.4.3. Mortar Bed for Walls (by volume): 1 part Portland cement, 4 parts sand, and latex additive where required by TTMAC Detail. Premixed mortar may be used per manufacturer's instructions. Adjust water volume depending on moisture content of sand to obtain consistency and workability.

2.4.4. Levelling Coat (by volume): 1 part Portland cement, 4 parts sand, and latex additive where required by TTMAC Detail. Premixed mortar may be used per manufacturer's instructions.

## 3. EXECUTION

### 3.1. EXAMINATION

3.1.1. Verify existing conditions are ready to receive work.

3.1.2. Ensure new substrate surfaces are clean, dimensionally stable, cured and free of contaminants such as oil, sealers and curing compounds.

- 3.1.3. Notify Consultant in writing of unacceptable substrate conditions. Beginning of installation implies acceptance of existing conditions.

### 3.2. PREPARATION

- 3.2.1. Protect surrounding work from damage or disfiguration.
- 3.2.2. Thoroughly clean existing surfaces that are to receive tile finish to ensure the removal of all grease, oil or dust film.
- 3.2.3. Apply a Portland cement based levelling coat wherever a slight substrate irregularity exists. Limit levelling coat thickness to less than 8 mm where thin-set tile methods are to be used. A levelling coat in excess of 8 mm shall be set with a mortar bed method.

### 3.3. APPLICATION

- 3.3.1. Install materials to requirements of TTMAC Tile Specification Guide, as scheduled below.
- 3.3.2. Fit tile units around corners, fitments, fixtures, drains and other built-in objects to maintain uniform joint appearance.
- 3.3.3. Make cut edges smooth, even and free from chipping. Do not split tile.
- 3.3.4. Lay out tiles according to drawings and patterns so that perimeter and all cut tiles are no less than half size.
- 3.3.5. Tile layout shall continue from and match with the tile layout and type used in front of the check-in counters.
- 3.3.6. Install Schluter corner trims to all outside tile corners and exposed edges.
- 3.3.7. Prior to installation ensure that the back of each tile is free of contaminants.

- 3.3.8. For tile with raised or textured backs, bonding material must be evenly dispersed and pressed into the back of the tile to ensure a minimum of 95% coverage. Set tile in place while bond coat is wet and tacky, prior to skinning over. Notch bond coat in horizontal straight lines and set on the freshly set bonding material while moving (sliding) tile back and forth at 90° to the notches. Ensure corner and edges are fully supported by bonding material. Avoid lippage.
- 3.3.9. Clean excess bonding material from surface prior to final set.
- 3.3.10. Sound tiles after setting materials have cured and replace hollow sounding tile before grouting.
- 3.3.11. Use sufficient bond coat to ensure minimum 80% contact. Bonding material must be evenly dispersed and pressed into the back of the tile.
- 3.3.12. Bond coverage of 95% evenly dispersed is required for tile larger than 305 mm x 305 mm, tile used in wet areas or exterior, and for tile used in areas rated Heavy or Extra Heavy Duty. To help ensure coverage [back-buttering] or [notch the bond coat in straight lines and move the tile back and forth perpendicular to notches when setting] are two techniques that can be used
- 3.3.13. Keep two-thirds of the depth of grout joints free of setting material.
- 3.3.14. Protect exposed edges of floor tile with appropriately sized transition strips. Provide reducer strips where uneven transitions between 6 mm and 12.5 mm occur.

#### 3.4. CONTROL JOINTS

<u>Environment</u>	<u>Minimum</u>
<u>Maximum</u>	<u>Joint Width</u>
Interior	4878 mm
6098 mm	6 mm

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Interior/Sunlight      3659 mm  
4878 mm      6 mm

3.4.1. Install control joints and expansion joints in tile work in accordance with TTMAC Detail 301MJ-2002.

3.4.2. Keep all control and expansion joints free of setting materials.

3.5. GROUTING

3.5.1. Allow proper setting time prior to grouting.

3.5.2. Pre-seal tiles requiring protection from grout staining.

3.5.3. Force grout into joints to ensure dense finish.

3.5.4. Remove excess and polish with clean cloths.

3.6. FIELD QUALITY CONTROL

3.6.1. Inspect completed work and replace broken, cracked, hollow sounding or damaged tile.

3.7. TOLERANCES

3.7.1. Set and level tile flush with adjacent tile (lippage 1 mm tolerance over a 3 mm joint).

3.8. CLEANING

3.8.1. Apply floor sealer in accordance with manufacturer's instructions.

3.9. PROTECTION

3.9.1. Protect finished areas from traffic until setting materials have sufficiently cured. Refer to TTMAC Tile Specification Guide 09300/2002.

3.9.2. Protect grouted areas from traffic for 24 hours after grouting.

3.9.3. Provide protective covering in traffic areas until substantial completion of the work.

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- 3.9.4. Protect wall tiles and bases from impact, vibration, heavy hammering on adjacent and opposite walls for at least 14 days after installation.

**SECTION 09 51 00 ACOUSTIC CEILING TILE**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- .1 Acoustic mineral fibreboard ceiling panels in exposed tee bar suspension system.
- .2 Design of seismic restraint for acoustic tile suspension system.
- .3 Repair and reworking of existing acoustic ceilings.
- .4 Engineering by Trade Contractor.

**1.2 RELATED SECTIONS**

- .1 Section 02 41 00 Demolition and Salvage.
- .2 Section 09 21 16 Gypsum Wallboard and Exterior Sheathing Systems.
- .3 Section 09 22 16 Metal Support Systems (incl. Load-bearing steel studs).
- .4 Divisions 21, 23 and 26.

**1.3 REFERENCE STANDARDS**

- .1 ASTM A653/A653M-13, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- .2 ASTM C635/A635M-13a, Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
- .3 ASTM C636/C636M-13, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
- .4 ASTM E580/E580M-14 Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.

**1.4 QUALITY ASSURANCE**

- .1 Qualifications: All work shall be done by qualified mechanics employed by an approved acoustical subcontractor and performed under the direct supervision of certified contractors representing members of the Acoustical Materials Association.



- .2 Provide design, fabrication, and seismic bracing restraint for acoustic tile suspension systems. Suspension systems shall be designed and installed to conform to current BC Building Code seismic restraint, including seismic restraint to ASTM E 580.
- .3 All components for ceiling suspension system shall be "intermediate" system manufactured to meet ASTM C-635 specifications and shall be formed from commercial quality cold rolled steel, zinc coated to meet required seismic restraint.
- .4 Follow the recommendations of the Association of Wall & Ceiling Contractors of BC (AWCC) Specifications Standards manual.

## **1.5 SUBMITTALS**

- .1 Samples: Submit samples for the Consultant's approval in accordance with Section 01 33 00. Do not order materials until approval is received. Samples shall include each type of exposed ceiling materials.
- .2 Shop drawings: submit ceiling plans showing grid system, light fixtures, diffusers, grilles, access panels and all insert locations as well as fire-rating requirements.
- .3 Trade Contractor's engineer to provide Schedules to Registered Professional of Record (RPR):
  - .a S-B, Assurance of Professional Design and Commitment for Field Review by Supporting Registered Professional (SRP).
  - .b S-C, Assurance of Professional Field Review and Compliance by Registered Professional (SRP).
- .4 Maintenance Materials: contractor shall provide a quantity of 2% over the original contract for Owner's future use. Neatly package and label before turning over to owner. Submission must be made all at one time and prior to Substantial Performance.

## **1.6 PRODUCT DELIVERY, STORAGE AND HANDLING**

- .1 Store all materials in original containers with the manufacturer's labels and seals intact. Protect from damage during handling and storage. Keep all material under dry cover, free from dampness, and raised above floor.

## **PART 2 PRODUCT**

### **2.1 SUSPENSION SYSTEM**

- .1 Exposed Tee Grid Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized steel, aluminum, or stainless steel) as per ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished

- galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.
- .2 Structural Classification: ASTM C 635 Intermediate Duty. Suspension system to support full assembly with 1/360 maximum deflection.
- .3 Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
- .4 Intermediate-duty suspension systems to ICC-ESR-1308. Pre-approved products:
1. CGC Ceiling system - USG Mars ceiling panels  
Suspension Grid: USG Donn DXT – Centricitee System Type E, Colour 052 Silvertone. (ADD 2)
2. Manufacturers of similar intermediate duty suspension systems are encouraged to submit their requests for alternate as per SECTION 01 33 00 and SECTION 01 60 00 SUBSTITUTION. (ADD 2)
- .5 Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- .6 Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least three times design load, but not less than 12 gauge.
- .7 Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner. Shadow molding to be compatible with Seismic system.
- .8 Accessories: as recommended by Manufacturer.
- .9 Exposed Tee Grid: (Existing): In ceilings as scheduled where existing grid is to remain, provide alterations to existing grid layout as noted on drawings. Where extensions to the grid are required, install salvaged materials from other areas. Review surplus ceiling grid material with Owner's representative and hand over some or all of this material as directed. Dispose of balance of sample materials off site.

## 2.2 LAY-IN ACOUSTIC COMPONENTS

- .1 Acceptable Acoustic Panels:
- .1 **Tile:** USG MARS System; Item No: 86985 2' x 2'x 3/4" White, FLB edge
- .2 Manufacturers of similar lay-in acoustic components are encouraged to submit their requests for equivalency as per Section 01 33 00 and Section 01 25 00.

- .3 Existing Acoustic Panels - refer to Demolition Section 02 41 00. Salvaged tiles from demolition shall NOT be used.

## **PART 3 ERECTION**

### **3.1 SURFACE CONDITION**

- .1 Ensure that work of other sections is secure and adequate. Do not start work until all electrical and mechanical work behind ceiling is inspected and approved.
- .2 Start of work implies acceptance of conditions and surfaces. Notify the Consultant in writing of all unsatisfactory conditions.

### **3.2 PREPARATION**

- .1 Coordinate with other trades in setting out and setting of metal items, insets, anchors, or other as work proceeds.
- .2 Coordinate grid layout, hanger spacing and module with Electrical work (e.g. 305x1220mm light fixtures) and as recommended by grid manufacturer.

### **3.3 GENERAL**

- .1 Install suspension system according to ASTM C636 "Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustic Tile and Lay-in Panels". Provide seismic restraint for the new ceiling grid, within project area.
- .2 The installer must examine the conditions under which the acoustical ceiling work is to be performed and notify the Contractor in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.
- .3 Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid the use of less-than-half width units at borders, and comply with reflected ceiling plans wherever possible.

### **3.4 INSTALLATION OF SUSPENSION**

- .1 Install wall angle at perimeter wall and also where grid abuts vertical surfaces, using uniformly spaced screws with allowance for variations in wall surfaces. Use preformed corners for angles. Include trim at lights and diffusers. Adequately brace and tie system to prevent movement, and level to a maximum tolerance 3 mm in 4 metres.
- .2 Suspend main 'T' runners at 610 mm o.c. maximum with suspension hangers 100 mm o.c. maximum. Provide additional hangers at lights and diffusers. Interlock cross 'T' into main runners at 1220 mm o.c. to conform to grid layout.

- .3 In areas where metric ceiling system is to remain, cut suspension system or add components from salvaged material to suit new layout. Relocate salvaged panels to suit new grid configuration.

### **3.4 INSTALLATION OF LAY-IN-PANELS**

- .1 Install materials in accordance with the manufacturer's printed instructions, and comply with governing regulations, fire resistance rating requirements as indicated, and industry standards applicable to the work. Arrange acoustical units and orient units in the manner shown by reflected ceiling plans or as directed by the Consultant.

### **3.6 CLEAN-UP**

- .1 Promptly as work proceeds, and on completion, clean up and remove from premises all debris and surplus material resulting from this section.

**End of Section**

## **SECTION 09 65 10 - RESILIENT FLOORING**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Resilient sheet floorings of linoleum, and flash-coved in washroom areas.
- .2 Weld rods.
- .3 Resilient base, edging and transitions.
- .4 Filling of rough and uneven floor surfaces is part of the work of this section, including surface preparation and concrete filler application. See also "*Section 03 35 10 Concrete Floor Finishes*" for patching and repairing crack materials, and leveling compounds with portland cement based compounds.

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 74 20 - Waste Management and Disposal.
- .3 Section 03 31 00 – Structural Cast-in-Place Concrete: Floor substrate surface.
- .4 Section 06 41 11 – Architectural Millwork: Millwork materials to receive application of base.
- .5 Section 09 21 16 - Gypsum Board Assemblies: Wall materials to receive application of base.

#### **1.3 REFERENCES**

- .1 American Society for Testing and Materials (ASTM):
  - .1 ASTM F 2034 Standard Specification for Linoleum Sheet Floor Covering.
  - .2 ASTM F 1869 Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
  - .3 ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
  - .4 ASTM F 1861 Standard Specification for Resilient Wall Base.
  - .5 ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
  - .6 ASTM F 1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring.
  - .7 ASTM E 648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
  - .8 ASTM E 662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
  - .9 ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
  - .10 ASTM E 492 Standard Test Method for Laboratory Measurement of Impact Sound Transmission through Floor-Ceiling Assemblies Using the Tapping Machine.
  - .11 ASTM E 989 Standard Classification for Determination of Impact Insulation Class (IIC).
- .2 National Fire Protection Association (NFPA):
  - .1 NFPA 253 Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant

- Heat Energy Source.
- .2 NFPA 258 Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- .3 International Standards and Training Alliance (INSTALL):
  - .1 INSTALL Resilient Certification

#### **1.4 SYSTEM DESCRIPTION**

- .1 Performance requirements: Provide flooring which has been manufactured, fabricated and installed to performance criteria certified by manufacturer without defects, damage or failure.

#### **1.5 SUBMITTALS FOR REVIEW**

- .1 Refer to Section 01 33 00: Submission procedures.
- .2 Product Data: Provide Manufacturer's current data on specified products, describing physical and performance characteristics; sizes, patterns and colours available
- .3 Shop Drawings: Indicate seaming plan, borders patterns.
- .4 Samples:
  - .1 Submit two (2) samples, 200 mm x 200 mm in size illustrating colour and pattern for each floor material for each colour specified.
  - .2 Submit two (2) long samples of base material for each colour specified.

#### **1.6 SUBMITTALS FOR INFORMATION**

- .1 Refer to Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements including special procedures, perimeter conditions requiring special attention.

#### **1.7 CLOSEOUT SUBMITTALS**

- .1 Refer to Section 01 78 10: Submission procedures.
- .2 Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

#### **1.8 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Refer to Section 01 78 40: Maintenance and extra material requirements.
- .2 Extra Stock Materials: Provide two (2) percent of flooring, base, materials of each material specified.

#### **1.9 QUALITY ASSURANCE**

- .1 All work to be installed by skilled workmen and to the current requirements of the National Floor Covering Association Specification Standards Manual for the types and conditions of work that apply.
- .2 Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
- .3 Engage installer certified as a Forbo "Associate Mechanic" or "Master Mechanic" or INSTALL certified Resilient Installer.

- .4 Installer must have performed installations of the same scale in the past five (5) years.
- .5 Fire Performance Characteristics: Provide resilient linoleum sheet flooring with the following fire performance characteristics as determined by testing products in accordance with ASTM method indicated below by a certified testing laboratory or another testing and inspecting agency acceptable to authorities having jurisdiction:
  - .1 Critical Radiant Flux: Class 1 Rating per NFPA 253 (ASTM E 648) (0.45 watts/cm<sup>2</sup> or greater).
  - .2 Smoke Density: Less than 450 per NFPA 258 (ASTM E 662).
- .6 Mock-up: install in location as directed by Consultant.

#### **1.10 REGULATORY REQUIREMENTS**

- .1 Conform to applicable code for flame/smoke rating requirements to CAN/ULC-S102.2.

#### **1.11 DELIVERY, STORAGE, AND PROTECTION**

- .1 Refer to Section 01 61 00: Transport, handle, store, and protect products.
- .2 Protect roll materials from damage by storing on end.

#### **1.12 ENVIRONMENTAL REQUIREMENTS**

- .1 Refer to Section 01 35 26: Environmental conditions affecting products on site.
- .2 Store materials for three days prior to installation in area of installation to achieve temperature stability.
- .3 Maintain ambient temperature required by adhesive manufacturer three (3) days prior to, during, and twenty-four (24) hours after installation of materials.

#### **1.13 WARRANTY**

- .1 Project Warranty: Refer to "Conditions of the Contract" for project warranty provisions.
- .2 Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
- .3 The resilient flooring is warranted against excessive wear under normal usage for a period of five (5) years from date of Substantial completion.

### **PART 2 - Products**

#### **2.1 MATERIALS – RESILIENT SHEET FLOORING**

- .1 Marmoleum by Forbo Flooring (Alternates may be submitted for approval up to 6 days before tender close).  
Harmonium xf2 by Johnsonite/Tarkett; is **APPROVED** as an acceptable alternate (Add 3)
- .2 Marmoleum® Fresco/Concrete Topshield™2
  - .1 Homogeneous sheet linoleum of primarily natural materials consisting of linseed oil, wood flour, and rosin binders, mixed and calendered onto natural jute backing. Pattern and color shall extend throughout total thickness of material.
  - .2 Backing: Jute

- .3 Total Thickness: 2.5 mm (1/10");
- .4 Width: 2.0 M (79");
- .5 Length: 32 M (105').
- .6 Colours: (refer drawings for colour coding and locations)
  - a. Colour no 1: 3701 – moon
  - b. Colour No 2: 3709- Silt
  - c. Colour No 3: 3708 – Fossil
  - d. Colour No 4: 3568 – Delta Lace

Colour No 1: Veneto 700 Frost, Colour No. 2: Tonali 201 Spanish Stucco, Colour No. 3: Tonali 203 Agrarian, Colour No. 3: Tonali 217 Venetian Fresco; are **APPROVED** as acceptable alternates (Add 3)

- .7 Adhesive: Forbo Flooring Inc., L885 Adhesive
- .8 Heat Welding Rod: Forbo Flooring Inc., Marmoweld color-matched welding rod.
- .9 Topshield 2 finish.

## **MATERIALS – Wall BASE**

- .1 .
- .2 Stainless steel wall base for resilient flooring in public areas.
- .3 Johnsonite Tightlock 111 mm wall base for resilient flooring in all other rooms.
- .4 Adhesive and sealer as per manufacture's recommendation. Submit product data sheets.
- .5 Color: to be selected by Consultant from manufacturer's full range

## **2.3 ACCESSORIES**

- .1 Rubber edgings, transitions and reducers to suit project conditions by accepted manufacturers listed above; Colours as selected by Consultant from full product range.
- .2 Seam Weld Rods: Colours as selected by Consultant to match sheet materials.
- .3 Underlayment and patching compound: Ardex Feather Finish or portland cement based underlayments and patching compounds as per Manufacturer's recommendation.
- .4 Subfloor Filler: type recommended by adhesive material manufacturer.
- .5 Cove filler: Manufacturer's proprietary material for flash coved base.
- .6 Primers and Adhesives: Waterproof; Products as recommended by the floor materials manufacturers.

## **PART 3 - Execution**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product's carton instructions for installation.

### **3.2 EXAMINATION**

- .1 Refer to Section 01 70 00: Verify existing conditions before starting work.



- .2 Verify concrete floors are dry by testing conducted in accordance with the current version of ASTM F 1869; Moisture Vapour Emission Rate (MVER) must not exceed 8.0 lbs. per 1,000 sq. ft. in 24 hours. Verify that concrete floors exhibit negative alkalinity, carbonization, or dusting.
- .3 Concrete subfloors shall be tested for moisture, pH and proper adhesive bond in accordance with manufacturer's written instructions.
- .4 Verify floor and lower wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.
- .5 Material Inspection: In accordance with manufacturer's installation requirements, visually inspect materials prior to installation. Material with visual defects shall not be installed and shall not be considered as a legitimate claim.

### **3.3 PREPARATION**

- .1 Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.
- .2 Surface Preparation:
  - .1 General: Prepare floor substrate in accordance with manufacturer's instructions.
  - .2 Floor Substrate: Floors shall be sound, smooth, flat, permanently dry, clean, and free of all foreign materials including, but not limited to, dust, paint, grease, oils, solvents, curing and hardening compounds, sealers, asphalt and old adhesive residue.
  - .3 Concrete Floor Substrate: Concrete floor substrate shall have a minimum compressive strength of 3,000 psi. Refer to "*Section 03 35 10 Concrete Floor Finishes*" for patching and repairing crack materials, and leveling compounds with portland cement based compounds. Where required, mechanically clean the floor using recommended preparation methods such as shotblasting, scarifying, diamond grinding, shaving or other acceptable methods to a suitable surface. Acid etching is not an acceptable method of cleaning the subfloor. Do not use solvents or sweeping compounds. Subfloor temperatures must be a minimum of 10°C.
- .3 Concrete Moisture Testing: Conduct moisture tests on all concrete floors regardless of the age, grade level or the presence of existing flooring. Conduct calcium chloride tests in accordance with ASTM F 1869. Measure the internal relative humidity of the concrete slab in accordance with ASTM F 2170. One test of each type should be conducted for every 1,000 square feet of flooring (minimum of 3). The tests should be conducted around the perimeter of the room, at columns, and anywhere moisture may be evident. Concrete moisture vapor emissions must not exceed 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo L 885 adhesive. Concrete internal relative humidity must not exceed 85% when using Forbo L 885 adhesive. A diagram of the area showing the location and results of each test should be submitted to the Architect, General Contractor or End User. If the test results exceed these limitations, the installation must not proceed until the problem has been corrected.
- .4 Smooth, dense finish, with a tolerance of 1/8" in a 10 ft radius (3 mm in 3.05 m radius). Floor Flatness and Floor Levelness (FF and FL) numbers are not recognized.
- .5 Sealing of cracks, holes and, smoothing and leveling of rough, uneven surfaces, must be carried out using a good quality Portland cement based leveling compound (feathering compound), approved by the manufacturer.
- .6 Subfloor Resilient Leveler System to be used between two different flooring elevations.

### **3.4 INSTALLATION - SHEET FLOORING**

- .1 Install sheet flooring to manufacturer's written instructions.
- .2 Adhesive Flooring Installation: Cut required length of linoleum flooring from roll, allowing enough material to extend up the wall 4 to 6 inches at either end. Layout and position sheet flooring so that any seams

will fall at least 6 inches from underlayment joints or saw cuts in concrete substrate. Scribe and cut flooring material to shape of vertical surfaces, including walls and partitions. Apply adhesive and lay sheet flooring into wet adhesive and roll with a 100 pound roller. Install sheet flooring square with room axis.

- .1 Adhesive, Seamless Flooring Installation: Rout out seams and heat weld together with complementary colored heat welding rod of complimentary composition in accordance with resilient flooring manufacturer's recommendations.
- .2 Adhesive Flooring and Flash Coved Base Installation: Extend flooring up the wall in a flash-coved method to a height of 150 mm, as indicated.
- .3 Adhesive Material Installation: Use trowel as recommended by flooring manufacturer for specific adhesive. Spread at a rate of approximately 150 ft<sup>2</sup>/gallon, as recommended by flooring manufacturer. Install sheet flooring to manufacturer's written instructions.
- .3 Installation Techniques:
  - .1 Where demountable partitions and other items are indicated for installation on top of finished flooring, install flooring before these items are installed.
  - .2 Scribe, cut, fit flooring to butt tightly to vertical surfaces, permanent fixtures and built-in furniture, including pipes, outlets, edgings, thresholds, nosings, and cabinets.
  - .3 Extend flooring into toe spaces, door reveals, closets, and similar openings.
  - .4 Install flooring on covers for telephone and electrical ducts, and similar items occurring within finish floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers.
  - .5 Do not install resilient flooring over expansion joints. Use expansion joint covers manufactured for use with resilient flooring. Refer to other specification sections for expansion joint covers.
  - .6 Adhere resilient flooring to substrate without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed installation.
    - .1 Use adhesive applied to substrate in compliance with flooring manufacturer's recommendations, including those for trowel notching, adhesive mixing, and adhesive open and working times.
  - .7 Roll resilient flooring as required by resilient flooring manufacturer.
  - .8 Finish Flooring Patterns: As selected by Architect.

### **3.5 INSTALLATION - BASE**

- .1 Fit joints tight and vertical. Layout base to keep number of joints at minimum.
- .2 Mitre internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use pre-moulded units.
- .3 Install base on solid backing. Bond tight to wall and floor surfaces.
- .4 Scribe and fit to door frames and other interruptions.

### **3.6 ACCESSORIES**

- .1 Install edging strips wherever resilient flooring terminates at unlike flooring.
- .2 Use longest practical lengths at each location.

### **3.7 CLEANING**

- .1 Refer to Section 01 74 00: Cleaning installed work.
- .2 Remove access adhesive from floor, base, and wall surfaces without damage.
- .3 Clean floor and base surfaces in accordance with manufacturer's written instructions.

**3.8 PROTECTION OF FINISHED WORK**

- .1 Refer to Section 01 78 40: Protecting installed work.
- .2 Prohibit traffic on floor finish for twenty-four (24) hours after installation. No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.
- .3 Allow at least 72 hours for adhesive to achieve bond before commencing recommended maintenance routine.

**END OF SECTION**

**SECTION 09 68 13 – CARPET TILE**

**PART 1 – GENERAL**

**1.1 SECTION INCLUDES**

- .1 Provide all carpet supply and installation work, as required by the Contract Documents, including building entrance mat.
- .2 Filling of rough and uneven floor surfaces is part of the work of this section, including surface preparation and concrete filler application. See also "Section 03 35 10 Concrete Floor Finishes" for patching and repairing crack materials, and leveling compounds with portland cement based compounds.
- .3 Sweep, mop, and vacuum floor of all loose granular debris.

**1.2 RELATED SECTIONS**

- .1 Section 01 25 00 Product Substitutions
- .2 Section 01 35 43 Environmental Procedures
- .3 Section 03 35 10 Concrete Floor Finishing
- .4 Section 09 65 00 Resilient Flooring

**1.3 REFERENCES**

- .1 ASTM D2859 - Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.
- .2 ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
- .3 ASTM E648 - Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- .4 NFPA 253 - Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Heat Energy Source.

**1.4 SUBMITTALS**

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings: Indicate seaming plan, method of joining seams, direction of carpet.
- .3 Product Data: Provide data on specified products, describing physical[and performance characteristics; sizes, patterns, colours available, and method of installation.

- .4 Samples: Submit one sample 300 x300 mm in size illustrating colour and pattern for each carpet material specified.
- .5 Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

## **1.5 QUALIFICATIONS**

- .1 Manufacturer: Company specializing in manufacturing specified carpet with minimum three years experience.
- .2 Installer: Company specializing in installing carpet with minimum three years experience.

## **1.6 REGULATORY REQUIREMENTS**

- .1 Conform to NFPA 253 and ASTM E648 Class I for flooring radiant panel test.
- .2 Conform to ASTM D2859 for surface flammability ignition test.

## **1.7 ENVIRONMENTAL REQUIREMENTS**

- .1 Store materials for 3 days prior to installation in area of installation to achieve temperature stability.
- .2 Maintain minimum 21 degrees ambient temperature 1days prior to, during and 24 hours after installation.

## **1.8 MAINTENANCE DATA**

- .1 Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

## **1.9 EXTRA MATERIAL**

- .1 Provide ten (10) percent coverage of calculated yardage for each type of carpet (calculated yardage shall include carpet needed for complete installation plus waste and usable scraps).
- .2 Deliver specified overrun and usable scraps of carpet to owner's designated storage space, properly packaged (boxed) and identified. Redirect small pieces of waste carpet to be appropriately recycled.

## **1.10 WARRANTY**

- .1 Provide warranties by Carpet Manufacturer including;
  - .1 Wear - Surface fiber wear shall not be more than 10% by weight in 15 years.

- .2 Static - Carpet will maintain static generation at less than 3.0 KV at 70o F, and 20% R.H. throughout the life of the product.
- .3 No Delamination (Chair Pads Not Required)
- .4 No Edge Ravel
- .5 No Dimensional Instability, i.e. shrinkage, curling, and doming, which adversely affect the ability of the tile to lay flat.
- .2 Provide warranties by Trade Contractor agreeing to rework any defective carpet handling or workmanship during one (1) year warranty period following substantial completion.
- .3 Submit manufacturer's certified independent test results to show that carpet meets or exceeds product performance specification criteria for carpet testing requirements (i.e. see item 2.4 (flame, smoke, Aachen test etc.).

## **PART 2 PRODUCTS**

### **2.1 ACCEPTABLE MANUFACTURES – CARPETING**

- .1 Subject to the minimum requirements listed above or below, provide carpeting as specified.
  - .1 Holdroom and offices
    - . Acceptable Manufacturer: MOHAWK GROUP
    - Style: CREATIVE TENSION
    - Colours: to be selected by Architect
  - .2 Building Entrance Mat
    - .1 Acceptable Manufacturer: Tandus / Centiva (Abrasive Action II 02578)
    - .2 Pattern and Color”: Provide 1 field color, to be selected by Consultant from manufacturer’s full range.

### **2.2 WALL BASE**

- .1 Stainless steel on MDF by millwork trade.
- .

### **2.3 ACCESSORIES**

- .1 Underlayment and patching compound: Ardex Feather Finish or Portland cement based underlayments and patching compounds as per Manufacturer’s recommendation.
- .2 Sub-Floor Filler: type recommended by adhesive material manufacturer.

- .3 Adhesive :Recommended by carpet manufacturer.
- .4 Edge and transition strips: vinyl type, colour to be selected by architect.

### **PART 3 EXECUTION**

#### **3.1 PRE-INSTALLATION REQUIREMENTS AND PREPARATORY WORK**

- .1 Individual installers not approved by carpet manufacturer will not be permitted to install products.
- .2 Do not commence with Work until mock-up has been approved in writing.
- .3 Trade Contractor shall measure carefully and check all dimensions and other conditions in the field to insure proper fit in the areas designated. Trade Contractor shall be totally responsible for the accuracy of his measurements on total yardage requirements, individual floor yardage requirements and dye lot yardage requirements. No request for carpet or installation extras from the owner will be considered due to measurement or takeoff errors by the Trade Contractor. Trade Contractor shall confirm total yardage required, including 10% attic stock along with bid.
- .4 Trade Contractor shall coordinate all installation activities with the Contractor.
- .5 Owner specifies that all existing carpet and new carpet waste be recycled in the best possible manner.
- .6 Sequence carpeting with other work so as to minimize possibility of damage and soiling of carpet during remainder of construction period. Do not commence carpet installation until painting and finishing work is complete and ceiling and other overhead work has been approved and completed, unless specifically approved in writing by owner's Project Manager.
- .7 Trade Contractor and manufacturer's representative must examine substrates for conditions over which carpeting is to be installed.
  - .1 New concrete shall be allowed to cure for ninety (90) days before carpet installation.
  - .2 Trade Contractor shall perform moisture content testing with proper application of the calcium chloride method. Carpet tile should not be installed unless the calcium chloride testing finds three pounds or less of vapor emission. Also, test the chemical pH of the concrete slab to insure pH reading is not greater than 9. Do not proceed until unsatisfactory conditions are corrected and the longevity of the installation is assured.
  - .3 Cracks 1/16" or more, holes, unevenness and roughness must be filled, leveled and made smooth with a compatible latex floor patching compound. Prior to filling, the floor must be swept clean of all loose granular debris. After filling, allow

filler to dry. BEFORE application, verify compatibility of filler product used with carpet tile adhesives. Then damp mop the floor with warm water and allow to dry. Vacuum after mopping, to insure all loose granular debris is removed and provide a proper substrate to install carpet.

- .4 All surfaces to receive carpet shall be clean and dry, and in a condition satisfactory to the Trade Contractor. Then, Trade Contractor shall notify General Contractor in writing of any conditions which will prevent him from producing satisfactory finish work after above specified preparatory work is completed.
- .5 Trade Contractor shall vacuum floors again immediately before installation of carpeting.
- .6 Confirm compatibility of adhesive with curing compounds on concrete floors.
- .7 Environmental Conditions: Areas to be carpeted must be pre-heated at a minimum of 15.5o c (60o F) for at least 72 hours prior to installation with the relative humidity not more than 65%. A minimum temperature of 13o c (50o F) shall be maintained thereafter. Carpet and adhesive must be stored at a minimum temperature of 15.5o c for 72 hours prior to installation.
- .8 Once the Trade Contractor commences installation work under this contract, it shall be assumed that the condition of the floor has been accepted and any repairs or further corrections in the floor surface shall become the responsibility of the Trade Contractor.

### **3.2 CARPET TILE INSTALLATION**

#### **.1 GENERAL**

- .1 Comply with manufacturer's instructions and recommendations for uniformity of direction for the carpet installation.
- .2 Install carpet under open-bottom obstructions and under removable flanges and furnishings, and into alcoves and closets of each space.
- .3 Provide cut outs where required. Conceal cut edges with protective edge guards or overlapping flanges.
- .4 Run carpet under open-bottom items such as heating convectors and install tight against walls, columns and cabinets so that the entire floor area is covered with carpet.
- .5 Install edging guard at all openings and doors wherever carpet terminates, unless indicated otherwise. Prior to installation, report to the General Contractor all other obstructions which may occur.



- .6 Cutting shall be done in accordance with the manufacturer's recommendation, using the tools designed for the carpet being installed. Pattern size or loop integrity shall not be compromised by the trade contractor's use of trace cuts or double cuts on any side seam.
- .7 All carpet tile shall be installed according to the Manufacturers standard installation instructions, except as expressly identified in the architectural drawings.
- .8 Use leveling compound where necessary. Any floor filling or leveling shall have a minimum of 4'0" of feather.
- .9 Expansion joints: Do not bridge building expansion joints with continuous carpeting. Provide for movements.

## **.2 INSTALLATION**

- .1 Laying Pattern to be standard brick ashlar or quarterturn contingent on carpet tile selection.
- .2 Install carpet according to carpet manufacturer's printed instructions and in keeping with the Carpet and Rug Institute's Installation Standard.
- .3 Installation contractor shall be a Carpet and Rug Institute's certified installation professional.
- .4 Tufted patterns must be row-cut on both side seams to maintain pattern integrity.
- .5 Maintain pattern integrity on all end seams.

## **3.3 RUBBER BASE INSTALLATION**

- .1 Install base in full bed of adhesive using full spread notched trowel. Cut and fit base neatly at corners, to tight fitting tolerances.
- .2 Install base straight and level to a maximum variation of 1:1000
- .3 Scribe base neatly and accurately to frames, cabinets and other interrupting surfaces. Keep joints tight and well fitted.
- .4 Use pre-moulded outside corners. Do not wrap coved base around outside corners as this will distort coved base profile. Butt inside corners.
- .5 Apply and tool sealant to produce smooth continuous joints free of voids, snags, impurities and smears.

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### **3.4 CLEANING AND PROTECTION**

- .1 On completion of the installation in each area, all dirt, carpet scraps, etc., must be removed from the surface of the carpet. Any soiling spots or excessive adhesive on the carpet shall be removed with the proper spot remover. Refer to Section 01340 Shop Drawings, Product Data and Samples.
- .2 Do not allow construction traffic, other than as may be required to fit up specific carpeted area, to traverse the completed work.
- .3 Remove debris, and sort pieces to be saved from scraps to be redirected and recycled.
- .4 General Contractor shall protect carpeting against damage during construction. Cover with 6-mil thick polyethylene covering with taped joints during the construction period, wherever protection is required, so that carpet will be without any indication of deterioration, wear, or damage at the time of acceptance. Damaged carpeting will be rejected. As the carpet is laid, remove all trimmings, excess pieces of carpet and laying materials from each area as it is completed.
- .5 At the completion of the work and when directed by the General Contractor, vacuum carpet using commercial dual motor vacuum of type recommended by carpet manufacturer. Remove spots and replace carpet where spots cannot be removed. Remove rejected carpeting and replace with new carpeting. Remove any protruding yarns with shears or sharp scissors.
- .6 Protection of carpeting with craft paper or other suitable covering shall be maintained on each floor or area until accepted, without waiting until the entire project is complete. Covering should permit curing of adhesives while protecting the carpet from construction traffic and debris.
- .7 If heavy furniture or equipment is to be moved over areas where carpet tile is already installed, plywood or masonite board must completely cover area where heavy objects will be rolled or slid.

### **3.5 INSPECTION**

- .1 Preliminary Acceptance: Upon completion of the carpet installation of each floor, it shall be inspected by Owner, the General Contractor, and Trade Contractor.
- .2 Upon completion of the installation, verify that work is complete, properly installed and acceptable. Remove and replace all work not found acceptable to the owner at the installer's expense.

**End of Section**

## 1. GENERAL

### 1.1. Description:

- 1.1.1. Section Includes: All labor, materials, tools and other equipment, services and supervision required to complete all exterior and interior painting and decorating work as indicated on Finish Schedules and to the full extent of the drawings and specifications.
- 1.1.2. Paint all new drywall. Paint all existing drywall,. Paint all new and existing doors and frames. Finish all wood in millwork.
- 1.1.3. The Work shall also include, but not necessarily be limited to surface preparation of substrates as required for acceptance of painting, including cleaning, small crack repair, patching, caulking, making good surfaces and areas, pre-treatment, priming and back-priming to the extent / limits defined under *MPI* preparation requirements.
- 1.1.4. This Contractor shall have a minimum of five (5) years proven satisfactory experience and shall maintain a qualified crew of painters throughout the duration of the work.
- 1.1.5. Only qualified journeypersons, as defined by local jurisdiction shall be engaged in painting and decorating work. Apprentices may be employed provided they work under the direct supervision of a qualified journeyperson in accordance with trade regulations.
- 1.1.6. All materials, preparation and workmanship shall conform to requirements of the latest edition of the Architectural Painting Specification Manual by the Master Painters Institute (*MPI*) (hereafter referred to as the *MPI* Painting Manual) as issued by the local *MPI* Accredited Quality Assurance Association having jurisdiction.
- 1.1.7. .All paint manufacturers and products used shall be as listed under the Approved Product List section of the *MPI* Painting Manual.
- 1.1.8. All painting and decorating work shall be inspected by a Paint Inspection Agency (inspector) acceptable to the specifying authority and the local *MPI* Accredited Quality Assurance Association. The painting contractor shall notify the Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of the project painting specification, plans and elevation drawings as well as a Finish Schedule.
- 1.1.9. All surfaces requiring painting shall be inspected by the Paint Inspection Agency who shall notify the Consultant and General Contractor in writing of any defects or problems, prior to commencing painting work, or after the prime coat shows defects in the substrate.
- 1.1.10. The painting contractor shall receive written confirmation of the specific surface preparation procedures and primers used for all fabricated steel items from the fabricator / supplier to ascertain

appropriate and manufacturer compatible finish coat materials to be used before painting any such work.

**1.2. Regulatory Requirements:**

- 1.2.1. Conform to work place safety regulations and requirements of those authorities having jurisdiction for storage, mixing, application and disposal of all paint and related hazardous materials.

**1.3. Submittals / Mock-Up:**

- 1.3.1. Submit consent of surety with Bid Submission as proof of ability to supply a 100% two (2) year Maintenance Bond, if an *MPI* Accredited Quality Assurance Association's guarantee option is not used.
- 1.3.2. If requested, submit an invoice list of all painting materials ordered for project work to Paint Inspection Agency indicating manufacturer, types and quantities for verification and compliance with specification and design requirements.
- 1.3.3. Submit two sets of Material Safety Data Sheets (MSDS) prior to commencement of work for review and for posting at job site as required.
- 1.3.4. At project completion provide an itemized list complete with manufacturer, paint type and color-coding for all colors used for Owner's later use in maintenance.
- 1.3.5. When requested by the Consultant or Paint Inspection Agency, prepare and paint a designated surface, area, room or item (in each color scheme) to requirements specified herein, with specified paint or coating showing selected colors, gloss/sheen, textures and workmanship to *MPI* Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

**1.4. Product Delivery, Storage, and Handling:**

- 1.4.1. Deliver and store all painting materials in sealed, original labeled containers bearing manufacturer's name, brand name, type of paint or coating and color designation, standard compliance, materials content as well as mixing and/or reducing and application requirements in strict accordance with manufacturer and *MPI* requirements.

**1.5. Environmental, Waste Management and Disposal Requirements:**

- 1.5.1. Perform no painting or decorating work when the ambient air and substrate temperatures, relative humidity and dew point and substrate moisture content is below or above requirements for both interior and exterior work.
- 1.5.2. Apply paint only to dry, clean, properly cured and adequately

prepared surfaces in areas where dust is no longer generated by construction activities such that airborne particles will not affect the quality of finished surfaces.

- 1.5.3. Ensure adequate continuous ventilation and sufficient heating and lighting is in place.
- 1.5.4. Paint, stain and wood preservative finishes and related materials (thinners, solvents, caulking, empty paint cans, cleaning rags, etc.) shall be regarded as hazardous products. Recycle and dispose of same subject to regulations of applicable authorities having jurisdiction.
- 1.5.5. To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground retain cleaning water and filter out and properly dispose of sediments.
- 1.5.6. Set aside and protect surplus and uncontaminated finish materials not required by the Owner and deliver or arrange collection for verifiable re-use or re-manufacturing.

1.6. Guarantee:

- 1.6.1. Provide and pay for either the local *MPI* Accredited Quality Assurance Association's two (2) year guarantee, or, alternatively, a 100% two (2) year Maintenance Bond - both in accordance with *MPI* Painting Manual requirements. The Maintenance Bond shall warrant that all painting work has been performed in accordance with *MPI* Painting Manual requirements.
- 1.6.2. All surfaces requiring painting shall be inspected by the Paint Inspection Agency who shall notify the Consultant and General Contractor in writing of any defects or problems, prior to commencing painting work, or after the prime coat shows defects in the substrate.

## 2. PRODUCTS

2.1. Materials:

- 2.1.1. use only *MPI* listed materials having an "L" rating designation.
- 2.1.2. Only materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, etc.) listed in the latest edition of the *MPI* Approved Product List (APL) are acceptable for use on this project. All such material shall be from a single manufacturer for each system used.
- 2.1.3. Other materials such as linseed oil, shellac, thinners, solvents, etc. shall be the highest quality product of an *MPI* listed manufacturer and shall be compatible with paint materials being used as required.

2.2. Mixing and Tinting:

- 2.2.1. Unless otherwise specified herein or pre-approved, all paint shall be ready-mixed and pre-tinted. Re-mix all paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and color and gloss uniformity. Where thinner is used, addition shall not exceed paint manufacturer's recommendations.

2.3. Finish, Color, Gloss / Sheen:

- 2.3.1. Unless otherwise noted, all painting work shall be in accordance with *MPI* Custom Grade finish requirements.
- 2.3.2. Colors shall be as selected by the Consultant from a manufacturer's full range of colors. The schedule will be furnished after award of the Contract, except general requirements shall be as noted herein.
- 2.3.3. Color selection will be based on two base colors and two accent colors.
- 2.3.4. Gloss level ratings of all painted surfaces shall be as noted on Finish Schedule. Refer to *MPI* Painting Manual for gloss level definitions and requirements.

**3. EXECUTION**

3.1. Condition and Preparation of Surfaces:

- 3.1.1. The condition and preparation requirements for all surfaces shall be in accordance with *MPI* Painting Manual requirements.

3.2. Application:

- 3.2.1. Do not paint unless substrates are acceptable and/or until all environmental conditions (heating, ventilation, lighting and completion of other subtrade work) are acceptable for applications of products.
- 3.2.2. Apply paint or stain in accordance with noted *MPI* finish Grade requirements.
- 3.2.3. Painting coats specified are intended to cover surfaces satisfactorily when applied at proper consistency and in accordance with manufacturer's recommendations. Apply a minimum of four coats of paint where deep or bright colors are used to achieve satisfactory results.

3.3. INTERIOR PAINT AND COATING SYSTEMS:

3.3.1. STRUCTURAL STEEL AND METAL FABRICATIONS:  
(columns, beams, joists, etc.)

INT 5.1R High performance architectural latex  
semi-gloss finish.

3.3.2. GALVANIZED METAL:  
(doors, frames, railings, misc. steel, pipes, overhead decking, ducts, etc.)

INT 5.3A Latex gloss finish.

3.3.3. DRESSED LUMBER:  
(including doors, door and window frames, casings, molding, etc.)

INT 6.3A High performance architectural latex  
semi-gloss finish.

3.3.4. NEW LAMINATED TIMBER BEAMS & CLT WOOD SLABS:

3.3.4.1. Transparent stain and Cetol UV or approved  
equivalent.

3.3.5. WOOD PANELING AND CASEWORK:  
(partitions, panels, shelving, millwork, etc.)

INT 6.4Y Lacquer, clear 20% sheen. shop applied  
finish.

3.3.6. PLASTER AND GYPSUM BOARD:  
(gypsum wallboard, drywall, "sheet rock type material", etc., and textured  
finishes)

INT 9.2A Latex eggshell finish (over latex sealer).

3.4. MECHANICAL / ELECTRICAL EQUIPMENT AND RELATED SURFACES:

- 3.4.1. Paint the inside of all ductwork where visible behind louvers, grilles and diffusers beyond sight line with primer and one coat of matt black (non-reflecting) paint. Paint the inside of light valances gloss white.
- 3.4.2. Refer to Mechanical and Electrical specifications for painting, banding, stenciling of other surfaces / equipment.

3.5. FIELD QUALITY CONTROL:

- 3.5.1. Painted surfaces shall be considered to lack uniformity and soundness in accordance with defects noted in the *MPI* Painting Manual. Refer to long form specification item 3.7 - Field Quality Control / Standard of Acceptance.
- 3.5.2. Painted surfaces rejected by the inspector shall be made good at the expense of the Contractor in accordance with *MPI* Painting Manual requirements.

3.6. PROTECTION AND CLEAN-UP:

- 3.6.1. Protect all newly painted exterior surfaces from elements condensation and contamination until paint coatings are completely dry. Erect barriers or screens and post signs to warn of or limit or direct traffic.
- 3.6.2. Remove all spilled, splashed, splattered or over sprayed paint as work progresses, remove waste materials and keep area free from an unnecessary accumulation of tools, equipment, surplus materials and debris.

END OF SECTION



**1. PART 1 - GENERAL**

1.1. 1.1 SCOPE

- 1.1.1. Supply and Install complete toilet partition systems, as indicated on the drawings and as in these specifications

1.2. Shop Drawings

- 1.2.1. Submit shop drawings or catalogue illustrations in accordance with Section 01001 - General Requirements.
- 1.2.2. Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors etc

**2. PART 2**

2.1. TOILET PARTITIONS

- 2.1.1. Core: Solid phenolic plastic
- 2.1.2. Finish: Matt finish melamine fused to core. Colour: to be selected by Architect
- 2.1.3. Doors: 19.0mm thick.
- 2.1.4. Panels: 12.0mm thick.
- 2.1.5. Edges: Polished black.
- 2.1.6. Fire Rating: To meet NFPA Class B, Uniform Building Code Class 1

2.2. Urinal Screens

- 2.2.1. 300mm (deep) x 1000mm (high) wall mounted, solid phenolic core.
- 2.2.2. Finish: Matt finish melamine fused to core. Colour: to be selected by Architect

2.2.3. Panels: 12.00mm thick.

2.2.4. Edges: Polished Black.

2.2.5. Fasteners: To be continuous for the entire height of the panel. Refer to drawings.

### 2.3. Hardware

2.3.1. General Note, all hardware to be Bobrick .67 Institutional series.

2.3.2. Hinges: Gravity type, designed to hold door slightly open to indicate compartment is vacant. Door shall lift from outside for emergency access.

2.3.3. Attachment Brackets: Stainless steel.

2.3.4. Levelling Saddle: 10.0mm diameter threaded rods secure stile to ceiling supports.

2.3.5. Pilaster Shoes: Stainless steel.

2.3.6. Fastenings: Stainless Steel, tamperproof machine screws in threaded solid brass inserts factory installed.

2.3.7. Accessories: Slide bolt latch, door strike, coat hook and bumper, "D" pull to handicapped units, interior and exterior.

2.3.8. Material and Finish: Type 304 satin finish stainless steel.

2.3.9. Hardware Location: Hardware and fastenings shall not be visible on the outside of compartments.

2.4. Finishes

- 2.4.1. Colour: from standard colour range, Arborite, Colour to be selected by Architect.

2.5. Acceptable Manufacturer

- 2.5.1. Bobrick 1082 Series, overhead braced, floor anchored.

**3. PART 3 – EXECUTION**

3.1. Inspection

- 3.1.1. Inspect the work of others upon which the work of this section depends and report to the Consultant any conditions which would affect the installation and performance of the work.
- 3.1.2. Obtain all dimensions affecting the work of this section from the job site.
- 3.1.3. Ensure anchorage reinforcing built in walls and ceilings is properly located to receive partition system. (Note that general contractor is responsible for design and installation of professionally engineered structural ceiling suspension system, complete with RPB/RPC certifications)

3.2. Installation

- 3.2.1. Install partitions and screens as indicated on the drawings, reviewed shop drawings and in accordance with the manufacturer's printed instructions.
- 3.2.2. Fasten brackets to substrates using fasteners designed to suit substrate conditions and provide permanent, secure anchorage under heavy use.
- 3.2.3. Ensure that fasteners do not cause ceramic tiles to crack, split, chip or be wedged apart.
- 3.2.4. Install partitions secure, plumb and square. Centre each cubicle screen on plumbing fixture except where specifically dimensioned otherwise.

- 3.2.5. Leave 12.0mm space between wall and panel or end pilaster. Close to view with privacy channel filler at end.
- 3.2.6. Provide for adjustment of ceiling variations with screw jack through steel saddles made integral with pilaster. Conceal leveling assembly with stainless steel shoes.
- 3.2.7. Adjust and align all hardware and doors. Adjust hinges to align door in partial open position when unlatched.

3.3. Inspection & Adjustment

- 3.3.1. Upon completion of the installation, adjust all components for proper operation and straight alignment, and touch up all scratches and abrasions to be completely invisible.
- 3.3.2. Repair any adjacent finishes damaged during installation.
- 3.3.3. Cleaning: Clean partitions and doors upon completion and leave free from imperfections.

## **SECTION 10 28 14 – TOILET AND BATH ACCESSORIES**

### **PART 1 - General**

#### **1.1 SECTION INCLUDES**

- .1 Toilet and bath accessories for washrooms.
- .2 Grab bars.
- .3 Attachment hardware.

#### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 01 57 13 - Construction Activity Pollution Prevention.
- .3 Section 01 74 20 - Waste Management and Disposal.
- .4 Section 05 50 00 - Metal Fabrications: In wall framing and plates for support of accessories.
- .5 Section 10 21 12 - Solid Plastic Toilet Compartments.

#### **1.3 REFERENCES**

- .1 ASTM A123/A123M-09 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A167-99(2009) - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .3 ASTM A269-08 - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- .4 ASTM A1008/A1008M-10 - Steel, Sheet, Cold-Rolled Carbon, Structural, High-Strength Low Alloy and High Strength Low Alloy with Improved Formability.
- .5 ASTM B456-03 - Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- .6 CAN/CSA-B651-04 - Accessible Design for the Built Environment.
- .7 NEMA LD3-2005 - High - Pressure Decorative Laminates.
- .8 The Building Access Handbook, Building Requirements for Persons with Disabilities from British Columbia Building Code 2006 including Illustrations and Commentary.

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Coordinate the work with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

### **1.5 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide illustrated product data sheets for each accessory describing size, finish, details of function, attachment methods.

### **1.6 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements including special procedures, and perimeter conditions requiring special attention.

### **1.7 CLOSEOUT SUBMITTALS**

- .1 Section 01 78 10: Submission procedures.

### **1.8 REGULATORY REQUIREMENTS**

- .1 Conform to The Building Access Handbook, Building Requirements for Persons with Disabilities from British Columbia Building Code 2012 including Illustrations and Commentary.
- .2 Conform to applicable code and CAN/CSA-B651 for accessibility requirements for the handicapped.

## **PART 2 - Products**

### **2.1 MANUFACTURERS**

- .1 Basis of Design: Bobrick Washroom Equipment, Inc.
- .2 Substitutions: Refer to Section 01 62 00.

### **2.2 MATERIALS**

- .1 Sheet Steel: to ASTM A653/A653M cold rolled, commercial quality, 0.912 mm minimum nominal thickness, with ZF001 designation zinc coating.
- .2 Stainless Steel Sheet: to ASTM A666, Type 304, finish as indicated in component list in 1.519 mm minimum nominal thickness.
- .3 Tubing: Type 304, commercial grade, seamless welded, 1.2 mm minimum wall thickness.
- .4 Fasteners: concealed screws and bolts hot dip galvanized after fabrication, tamper and theft resistant exposed fasteners to match material of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

### **2.3 FABRICATION**

- .1 Weld and grind joints of fabricated components, smooth.
- .2 Form exposed surfaces from single sheet of stock, free of joints. Form surfaces flat without distortion. Maintain surfaces without scratches or dents.

- .3 Fabricate grab bars of tubing, free of visible joints, return to wall with end attachment flanges. Knurl grip surfaces.
- .4 Shop assemble components and package complete with anchors and fittings.
- .5 Provide steel anchor plates, adapters, and anchor components for installation.

## **2.4 KEYING**

- .1 Supply keys for each accessory to Owner.
- .2 Master key all accessories.

## **2.5 FINISHES**

- .1 Galvanizing: Hot-dip galvanized to ASTM A123/A123M, appropriate grade for type and size of steel material indicated. Galvanize ferrous metal and fastening devices.
- .2 Shop Primed Ferrous Metals: Pre-treat and clean, spray apply one coat primer and bake.
- .3 Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Consultant.
- .4 Chrome/Nickel Plating: to ASTM B456; finish as directed by Consultant.
- .5 Stainless Steel: satin finish.

## **PART 3 - Execution**

### **3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that field measurements are as instructed by the manufacturer.
- .3 Verify that site conditions are ready to receive work and dimensions are as instructed by the manufacturer.
- .4 Verify exact location of accessories for installation.

### **3.2 PREPARATION**

- .1 Deliver inserts and rough-in frames to site for timely installation.
- .2 Provide templates and rough-in measurements as required.

### **3.3 INSTALLATION**

- .1 Install accessories to manufacturer's written instructions and CAN/CSA-B65].
- .2 Install plumb and level, securely and rigidly anchored to substrate.

SCHEDULE ( SUBMIT SHOP DRAWINGS)

<b>Item</b>	<b>Quantity</b>	<b>Description</b>	<b>Manufacturer/Model</b>
Accessible Toilet Tissue Dispenser	One per toilet	Satin-finish stainless steel unit with stainless steel dispensing mechanism. Door has flat face with protruding tumbler lock. Holds two rolls up to 5 1/4" (135mm) diameter (1800 sheets). Extra roll automatically drops in place when bottom roll is depleted. Theft-resistant, heavy-duty spindles.	Bobrick B-2888
Accessible Paper Towel Dispenser	One per washroom	Satin-finish stainless steel. Touch-free, pull-towel mechanism dispenses 12" (305mm) length per pull [1.8 lbs (8.0 N)] of universal towels. Accommodates 8" (205mm) wide, up to 8" (205mm) diameter rolls, 800 ft (244m) long, plus 3 1/2" (90mm) dia. stub roll with automatic transfer. Door has tumbler lock and piano-hinge.	Bobrick B-2860
Accessible Soap Dispenser	One per hand basin or pair of hand basins if centered between them.	Corrosion-resistant valve dispenses commercially marketed all-purpose hand soaps. Container is satin-finish stainless steel. Capacity: 40-fl oz (1.2-L). Soap refill window. Concealed wall fastening. Hinged filler-top requires special key to open. Vandal-resistant. Unit 7" W, 6 1/8" H (180 x 155mm); wall to push-button, 3 5/16" (85mm)	Bobrick B-4112
Accessible Feminine Napkin Dispenser	One for Room 104-6 Womens's	11-7/8" W x 25-7/8" H. Adjustable flange surface mounts the unit. Push-Button Operation, Less Than 5 Lb of Force, No Grasping, Pinching or Twisting of the Wrist. Easy access Product tray. Single-coin slots are key to jam-resistant operation. Accepts one or two quarters (U.S. or Canadian). Push-button coin return cancels Product selection. Returned coins or wrong coins (1¢, 5¢, 10¢) by-pass mechanism and drop into Product tray. Empty Product indicator automatically blocks coin slot. Easy Product loading, no weights. Holds 30 tampons, 20 napkins. Two tumbler door locks keyed like other Bobrick accessories.	Bobrick B2706 25
Waste receptacle	One per washroom	Satin-finish stainless steel. Vinyl wall bumper, rubber feet. Hooks for liners. Capacity: 13-gal. (49.2-L). Unit 13 3/8" x 13 3/8" (340 x 340mm) at top, 29 1/2"	Bobrick B2260



		(750mm) high.	
Accessible Napkin Disposal	One per toilet in 104-6 Women's and Universal Washrooms	Part 1 Surface-Mounted Sanitary Napkin Disposal	Bobrick B270
Coat Hook, Door-mounted	One per toilet	Heavy duty clothes hook with concealed mounting, brass casting with satin nickel-plated finish to match stainless steel.	Bobrick B-2116
Mirrors	One per hand basin	610 x 900 mm (24" x 36") size, stainless steel frame.	Bobrick B-165 2436
Grab Bars: 120 degree; 610 mm horiz. or pairs 304 mm long	One 120 degree bar per accessible toilet; one horiz. 610 mm long or two 304 mm long per flush valve toilet	18 gauge stainless steel tubing, 76 mm (3 inch) diameter flanges 12 mm (1/2 inch) deep 3.1 mm (11 ga), 2.4 mm (13 ga) concealed mounting plate, 4 stainless steel vandal resistant screws.  To BC Building Compliance. Submit shop dwg.	Bobrick
Baby Change	One per public washroom	Horizontal wall-mount, fold-down bed, Polypropylene with stainless steel veneer.	Bobrick KB200-SS
Shelf with Mop/Broom Holder	One per janitor closet	203 mm x 914 mm stainless steel shelf with 3 mop/broom holders, rag hooks and drying rod	Bobrick B-224x36
Warm Air Hand Dryer	One per public washroom	Slim profile.	Bobrick B-7120 or Dyson Airblade V hand Dryer AB12

**END OF SECTION**

## **PART 1 - General**

### **1.1 SECTION INCLUDES**

- .1 Portable fire extinguishers.
- .2 Safety blankets, if required.
- .3 Cabinets and wall brackets.

### **1.2 RELATED SECTIONS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.
- .2 Section 06 11 00 - Wood Framing: Wood blocking and shims.
- .3 Section 09 21 16 – Gypsum Board Assemblies.

### **1.3 REFERENCES**

- .1 NFPA 10-2007 - Portable Fire Extinguishers.
- .2 CAN/ULC-S503-05 - Carbon-Dioxide Fire Extinguishers.
- .3 CAN/ULC-S504-02 - Dry Chemical Fire Extinguishers.
- .4 CAN/ULC-S508-02 - Rating and Fire Testing of Fire Extinguishers.

### **1.4 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide extinguisher operational features, colour and finish, anchorage details. Provide extinguisher operational features, colour and finish, and anchorage details.
- .3 Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets, wall bracket mounted measurements location. Indicate proposed locations for review, coordination and adjustment by the architectural Consultant.

### **1.5 SUBMITTALS FOR INFORMATION**

- .1 Refer to Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements, including special criteria and wall opening coordination requirements.
- .3 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

### **1.6 CLOSEOUT SUBMITTALS**

- .1 Refer to Section 01 78 10: Submission procedures.
- .2 Operation and Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

## **1.7 QUALITY ASSURANCE**

- .1 Products of this Section: Manufactured to ISO 9000 certification requirements.
- .2 Provide units to CAN/ULC-S508. Maintain one copy of each document on site.

## **1.8 REGULATORY REQUIREMENTS**

- .1 Conform to applicable codes and NFPA 10 for requirements for extinguishers.
- .2

## **1.9 ENVIRONMENTAL REQUIREMENTS**

- .1 Refer to Section 01 35 26: Environmental conditions affecting products on site.
- .2 Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

## **PART 2 - Products**

### **2.1 MULTI-PURPOSE DRY CHEMICAL EXTINGUISHERS**

- .1 4.5 kg (10 lbs) Extinguisher: Multi-purpose stored pressure rechargeable fire extinguisher, squeeze grip positive on/off operation, heavy duty glossy enamel finish steel cylinder, pull pin safety lock, forged valve, rating 4-A, 60-B, C.
  - .1 Acceptable Products: National Fire Equipment ABC-10F, General, Ansul, Chubb, Pyrene (Kiddie), Strike First.
- .2 2.3 kg (5 lbs) Extinguisher: Multi-purpose stored pressure rechargeable fire extinguisher, squeeze grip positive on/off operation, heavy duty glossy enamel finish steel cylinder, pull pin safety lock, forged valve, rating 2-A, 10-B, C.
  - .1 Acceptable Products: National Fire Equipment ABC-050W, General, Ansul, Chubb, Pyrene (Kiddie), Strike First.
- .3 Identify extinguishers in accordance with the recommendations of ANSI/NFPA 10. Attach tag or label to extinguishers indicating month and year of installation. Provide space for service dates.

### **2.2 CABINETS**

- .1 Cabinet constructed of 1.19 mm (18 ga) steel tub and 2 mm (14 ga) steel door with transparent bubble canopy and trim with 25 mm (1") return frame, full length semi-concealed piano hinge and flush stainless steel door latch. Front section to have a full 50 mm (2") adjustment to wall. Finishes: Exterior and door to be baked enamel, Colour: red; Interior to be baked enamel, Colour: white.
- .2 Standard of Acceptance: National Fire Equipment C-950-1.
- .3 Suitable for 4.5 kg (10 lbs) extinguisher.

### **2.3 ACCESSORIES**

- .1 Extinguisher Brackets: Formed steel, chromed Formed steel, galvanized white enamel.
- .2 Cabinet Signage: as required by Authority having Jurisdiction.

**PART 3 - Execution**

**3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify rough openings for cabinet are correctly sized and located.

**3.2 INSTALLATION**

- .1 Install to manufacturer's instructions.
- .2 Install cabinets plumb and level in wall openings. Height as indicated on Drawings
- .3 Secure rigidly in place.
- .4 Place extinguishers in cabinets.
- .5 Position cabinet signage at top of cabinet.

**END OF SECTION**

## **1. GENERAL**

### **1.1. Overview**

- 1.1.1. The Town of Smithers have contracted separately with PACIFIC CONVEYING, for the supply and installation of a fully complete, operational and commissioned bag claim / bag conveyor system as shown on the drawings.**
- 1.1.2. The scope of Pacific Conveying work is included below for bidders' information.**
- 1.1.3. Bidders shall include in their tender ONLY for the integration of this work into the project, and shall be responsible to plan, schedule, coordinate, cooperate to ensure that the Pacific Conveying part of the work is integrated seamlessly into the architecture and construction process and schedule.**

### **1.2. SCOPE OF PACIFIC CONVEYING WORK**

- 1.2.1. Provide all labour, Materials, equipment and supervision required for the design, fabrication, installation, testing and commissioning, and successful operation of the baggage handling systems components workscope shown on the drawings; Including but not limited to:
- 1.2.2. All new conveyor and racetrack components, roller beds, draft curtains, (A) electrical controls, mechanical equipment, structural supports, , seismic design, and a well-planned installation, phasing, testing and commissioning sequence.
- 1.2.3. Include participation in design coordination meetings with the Airport Authority and/ or the building Architectural / Engineering team.
- 1.2.4. Provide shop drawing submittals of all conveyor equipment for approval prior to commencement of manufacturing.
- 1.2.5. Shop drawing shall illustrate the details of all controls, operational sequences, safety switches, baggage jam and over height detection, alarms etc.

### **1.3. References**

- 1.3.1. The following standards and references are to be considered and followed in the design and installation of the baggage handling systems:
  - 1.3.1.1. Conveyor Equipment Manufacturers Association (CEMA) Installation Standards

- 1.3.1.2. International Air Transport Association (IATA)1995 Development Reference Manual
- 1.3.1.3. International Standard Organisation
- 1.3.1.4. American Society for Testing and Materials (ASTM), including:
- 1.3.1.5. ASTM A167 – Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
- 1.3.1.6. ASTM A325 - High Strength Bolts for Structural Steel Joints.
- 1.3.1.7. ASTM A500 – Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- 1.3.1.8. ASTM A501 – Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- 1.3.1.9. ASTM A653/A653M – Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc- Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- 1.3.1.10. American National Standards Institute (ANSI)
- 1.3.1.11. Canadian Standards Association (CSA), including:
- 1.3.1.12. CAN/CSA G40.21-M – Structural Steel.
- 1.3.1.13. CAN/CSA W47.1 – Certification of Companies for Fusion Welding of Steel Structures.
- 1.3.1.14. CAN/CSA W55.3 – Resistance Welding Qualification Code for Fabrication of Structural Members used in buildings.
- 1.3.1.15. CAN/CSA Z432 – Safeguarding of Machinery .
- 1.3.1.16. Canadian Welding Bureau (CWB)
- 1.3.1.17. Canadian Institute of Steel Construction (CISC)
- 1.3.1.18. National Electrical Manufacturers Association (NEMA)
- 1.3.1.19. Underwriters' Laboratories of Canada (ULC)
- 1.3.1.20. National Fire Code 2005
- 1.3.1.21. Submit a listing of any other Standards used in the manufacture or installation of equipment that is not listed above for approval by the Airport Authority.

#### **1.4. Codes and Regulations:**

- 1.4.1. Comply with applicable governing codes and regulations for conveying systems and electrical work including the 2012 British Columbia Building Code (BCBC) and CSA C22.1 (Canadian Electrical Code).

#### **1.5. Quality**

- 1.5.1. Provide equipment of the highest quality, new and free from defects, with proven reliability through actual heavy duty airline applications.
- 1.5.2. The Contractor shall be responsible for providing a Quality Control Program to ensure that the standards set out in the technical specifications are met during all phases of the Contract.
- 1.5.3. Any part of the work found to be not in accordance with the

Contract Documents shall be corrected at no additional cost for the correction.

### **1.6. Safety**

- 1.6.1. Equipment and installation shall conform to the current standards and interpretations of applicable laws concerning occupational safety and health, including but not limited to the following:
- 1.6.2. Equipment shall be free of burrs, sharp edges and mechanisms which could catch limbs and clothing.
- 1.6.3. Provide protection for moving mechanisms which could catch limbs and clothing.
- 1.6.4. Provide illuminated emergency stop switches and lanyard or mushroom style push buttons accessible at every conveyor and system, in accordance with industry recommended safety practices.
- 1.6.5. Provide safety signage in both English and French languages.
- 1.6.6. Provide effective static or electronic guarding of equipment to meet the requirements of CAN/CSA Z432 – Safeguarding of Machinery.

### **1.7. Design and Coordination**

- 1.7.1. Design Coordination: During the design of the conveyor systems, coordinate with the design of the building design architects and engineers to ensure that the building services and structure allow for conveyor installation and clearance requirements for both new and future conveyors and hold baggage screening systems. Provide dimensional requirements for wall openings.
- 1.7.2. Construction Coordination: Coordinate the Work with the work of others, checking for interference with other trades during installation. Coordinate the installation schedule and sequence with work of other trades. Coordinate the details of and schedule for the provision of embedded work such as the fire door support frames. Ensure that installation of the embedded items meets the requirements of the overall building schedule.

### **1.8. Warranty**

- 1.8.1. Warrant all products to be free from defects in materials and workmanship for a period of eighteen (18) months commencing on the date of Acceptance for Warranty Purposes. Provide a common warranty start date for all equipment, no matter what start date for beneficial use occurs for each system.
- 1.8.2. Replace or repair any defective component, assembly, or sub-system which malfunctions or fails while operating for the purpose intended by the manufacturer. Warranty replacement and repair shall include all shipping, handling, labour and materials.

- 1.8.3. Furnish trained experts and equipment to check, adjust or lubricate materials and parts which become defective or deteriorated for any reason except through abuse or misuse by Airport Authority or occupants of the building. Return to Site, within one hour of time Airport Authority reports defective operation, and proceed with repair and maintenance work to restore operation promptly.

## **2. PRODUCTS**

### **2.1. Pallet Loop**

- 2.1.1. Disassemble existing pallet loop, re-install pallet loop in new location. Add additional components to achieve loop size shown on drawings. Refurbish, repair and service existing components.
- 2.1.2. Crescent type Pallet Loop reclaim and racetrack type carousel. Chain of linked crescent shaped pallets forming a continuous loop. The loop passes through airside for loading bags and onto the public side for baggage reclaim. Where the loop passes through the reclaim hall wall the wall penetration will be protected with a draft curtain.

### **2.2. Features:**

- 2.2.1. Flat crescent plate loop • Designed for medium density airports • Versatile design able to achieve a variety of configurations and layouts • Durable-reliable-quiet.
- 2.2.2. The urethane-surfaced pallets are mounted on steel support carriages and the carriages are connected together to form the driving and support chain of the carousel. A steel frame beneath the carriage provides both the support structure for the carousel as well the carriage guide tracks. Two lines of wheels, one on either side of the pallet centre line, mounted from the carousel structure support the pallet and ensure smooth movement of the pallet as it moves around the loop.
- 2.2.3. The carousel is fitted with trim covering the edges of the pallet and carousel structure to provide a safe and pleasing finish. The inner side of the carousel has a raised trim panel higher than the pallet by 180mm (nominal) to provide bag guides and edge support for the conveyor infill. The inner trim seamlessly covers the pallet edge/carousel and top edge of the carousel inner side. The outer side trim shall include a toe kick plate covered by a curved vinyl-finishing strip.
- 2.2.4. The public side finishing trim is stainless steel and the airside trim is manufactured in galvanized steel.

### **2.3. Mechanical Specifications:**

- 2.3.1. Average mass per linear meter: 98 kg /m



- 2.3.2. Max dynamic: load 100 kg/m (50kg / bag)
- 2.3.3. Max Static load: 150 kg/m
- 2.3.4. Speed: adjustable, 0.3 to 0.5 m/s
- 2.3.5. Gear motor sizing rules Load factor = 120% maximum load; Duty factor = 150%
- 2.3.6. System operating hours: 20 hours per day, 7 days per week.
- 2.3.7. Gear motor manufacturer: Nord or SEW
- 2.3.8. Pallet: Polyurethane elastomer (black)
- 2.3.9. Pallet Core: Composite
- 2.3.10. Support wheels per pallet: 10 rollers per pallet minimum.
- 2.3.11. Drive Specifications
- 2.3.12. No. Of Drives: One standard,
- 2.3.13. Manufacturer: (GP Standard) or Nord SEW Eurodrive
- 2.3.14. Type: SK range, helical worm wheel SA range, helical worm wheel
- 2.3.15. Mounting: Flange Mounted
- 2.3.16. Power: from 1.5 kW Phase 3 Voltage (Refer to Electrical Drawings and Specifications)

## **2.4. Drive**

- 2.4.1. The pallet loop is driven by a simple and reliable caterpillar type drive system. The driving force is transmitted to the carriages via an outrigger drive dog roller chain system. The chain rotates over a guide rail system that lifts the chain to engage the outrigger driving roller dogs with corresponding lugs on the pallet undercarriages.
- 2.4.2. The chain guides are fitted with a suitable wear strip for low noise and wear protection of the chain. The chain rotates over two end sprockets fitted with a chain tensioning adjustment system. Oiling of the chain, although minimal and infrequent, can be manually carried out during maintenance checks. The caterpillar drive chain is a precision transmission chain and shall have minimum 2 drive lugs engaged with the carriages at one time.
- 2.4.3. The motor gearbox unit is a single integrated gear/motor and is flange mounted to the head of the caterpillar drive. The electric motor is a 4 pole 3-phase totally enclosed unit. Power and duty cycle are selected and engineered for the specified conveyor length, load and application using the design rules listed in this spec.
- 2.4.4. Bearings used are greased for life maintenance free.
- 2.4.5. The drives are engineered and selected with local conditions in mind for on-going reliability, maintenance and availability of spare

parts and service.

## **2.5. Pallets**

- 2.5.1. Each pallet is manufactured as a composite of either a woodchip composite or steel structural core (option). This core is fully encapsulated with a viscose 2 part polyurethane to achieve a designed skin thickness of nominally 3mm all over the surface and shall provide an accurate profile. This coating is extremely wear resistant and includes a built-in lubricant to ensure long life and low noise. The top surface of the pallet has a pebble dashed finish.
- 2.5.2. After post-curing the quality-checked pallets all exceed the dynamic and static loads specified and are capable of supporting the live weight of 150kg/m on the conveying system without undue deflection or damage being sustained.

## **2.6. Pallet Under-Carriages**

- 2.6.1. The under carriages shall be linked together to create an endless chain to which the pallets can be bolted to complete an endless loop and conveying surface. The under carriages are fabricated from mild steel weldments, jig machined to the designed pitch then fitted with a self-aligning hemispherical bearing, which are part of the joint arrangement to connect the carriages together to form a chain. The under carriage assemblies are joined together through the spherical bearings using 12mm diameter precision shouldered bolts. One side of the bolt-hole in the under carriage is tapped during the carriage fabrication and the bolts are further secured using a locking grub screw. The finished under carriage is electro-galvanized to provide lasting corrosion protection.
- 2.6.2. At the leading end, in the centre of the under carriage a centering wheel assembly is located to guide the carriage assembly around the pre-formed track way. The centering wheels are a high-density plastic tyre moulded onto a precision sealed for life ball bearing.
- 2.6.3. A pair of machined lugs are positioned under and to one side of the under carriage to engage with the caterpillar drive chain roller drive dogs.
- 2.6.4. Note all components are machined and manufactured from steel.

## **2.7. Pallet Support Wheels**

- 2.7.1. Two tracks of wheels either side of the loop centreline support the pallet as it passes around the loop. The wheels are mounted directly to the support frame structure beneath the pallets and are designed for long life and low noise. The support wheels are a high-density plastic tyre moulded onto a precision sealed for life ball bearing and are attached to the support frame by a bolt locked with a nyloc type nut.

## **2.8. Framework**

- 2.8.1. The pallet loop framework is manufactured in modules of mild steel sections and pressings. The centre guide rails and bed rails are bolted to cross ties for structural strength. The cross ties are supported and levelled using robust screw adjustable legs. The outer line of legs provide the attachment point for a toe recess kick plate, which also form the bottom section of the trim skirting. The centre part of the carousel frame includes mounting locations for the optional infill.

## **2.9. Panelling/Trim**

- 2.9.1. Pallet Loops are trimmed to 2 standards depending on the exposure of the carousel, that is, galvanised steel panelling for that part of the unit exposed to airside and stainless steel panelling in those areas exposed to the Public side.
- 2.9.2. The centre of the pallet loop conveyor shall be provided with a panelling up stand extending vertically 180mm above the top surface of the pallet. The up stand forms a guard to prevent baggage spilling into the centre of the loop and forms a finishing edge to the optional centre in- fill.

## **2.10. Airside Panelling/Trim**

- 2.10.1. The airside trim is constructed from 3.0mm galvanized mild steel panelling. This section of the carousel shall be fitted with trim as follows;
- 2.10.2. Inner edge shall be provided with a high side, 180mm above the pallet surface, and running the entire length of this section, including the curves.
- 2.10.3. Outer edge, straight section, shall be provided with side trim from the top of the pallet down over the conveyor structure. The drive shall be fitted with appropriate safety guarding.

## **2.11. Public Panelling/Trim**

- 2.11.1. The public side trim shall be constructed from 2.5mm stainless steel panelling finished with a No 4 brush polished finish. This section of the carousel shall be fitted with trim as follows;
- 2.11.2. The Inner edge shall be provided with a high side, 180mm above the pallet surface, and running the entire length of this section, including the curves. •
- 2.11.3. Outer edge, straight and curved curve sections, shall be provided with side trim from the top of the pallet down over the conveyor structure. •
- 2.11.4. A toe kick and vinyl finish/floor trim shall be fitted to the entire outer edge. The toe kick shall form a part of the carousel trim and shall be high enough to overlap and be fitted such that it is recessed behind the stainless trim from above. The toe kick shall

be constructed from galvanised mild steel. •

2.11.5. Joins in the stainless trim shall be butted type joins. The butt join shall be finished such that the sheets butt together neatly without gaps.

#### **2.11.6. DRAFT FLAPS**

2.11.7. Supply and Install two standard type draft flaps to the airside face of the wall openings through which the racetrack passes. Draft flaps shall consist of 100mm wide heavy flexible black PVC strips, installed in double depth, staggered manner. Flaps shall be designed to stop air drafts when the racetrack is not in use. Draft flaps shall include channel shaped stainless steel protection frames to all 3 sides of each wall openings to protect against luggage impact.

### **.1 CONVEYOR BELTS**

3. Supply and install 2 conveyor belts as shown on drawing.

4.

5. EXECUTION

#### **5.1. Installation**

5.1.1. General: Installation shall comply with applicable codes and manufacturer's instructions and recommendations.

5.1.2. Set units true to line and level, properly supported and anchored to building structure.

5.1.3. Do not install housings on conveyors until after inspection of mountings, welds, tracks, guides and drive units for proper installation.

5.1.4. Adjust installed components for smooth, efficient operation, complying with required tolerances and free of hazardous conditions. Lubricate operating parts including bearings, tracks, chain guides, and hardware.

5.1.5. Repair damaged components and finishes or, if damaged beyond acceptable condition, replace damaged components.

5.1.6. Ensure stainless steel trim in public areas is set flush and that joints and corners are smooth, with no catch points. Grind surfaces and corners as required to suit.

#### **5.2. Testing, Commissioning And Instruction**

5.2.1. Meet all performance and other criteria specified in the Documents.

5.2.2. Upon completion of installation of each of the individual conveyors and claims devices, the Contractor shall commission the individual so as to advance that system to a stage in which it may be tested and turned over to the Airport Authority.

- 5.2.3. Establish mutually agreeable dates for start of testing with the Airport Authority at least two (2) weeks in advance. Provide personnel, baggage, totes, boxes, and baggage tags for testing and commissioning.
- 5.2.4. The acceptance testing of each system shall be conducted in the presence of the airport representative. Testing shall include as a minimum:
- 5.2.5. Checkout of the operational safety devices of the system using bags, totes, or boxes.
- 5.2.6. Demonstration of the capability to handle the required sizes and weights of baggage through the system without jamming or toppling of baggage.
- 5.2.7. Demonstration of the capability of conveyor to start under full load.
- 5.2.8. Measurement of all conveyor speeds using a standard device in a "no-load" condition; i.e., all conveyors in a system running but without product. Any component not operating within five (5) percent of design speed shall be reworked to bring it to proper speed.
- 5.2.9. Measurement of noise levels by an acoustic engineer shall be required if the equipment noise levels do not appear to meet the requirements.
- 5.2.10. Instruction and Maintenance: Instruct the Airport Authority, maintenance personnel and airline personnel in separate sessions on proper use, operation, and daily maintenance of baggage conveyor systems.

### **5.3. Spare Parts**

- 5.3.1. Provide spare parts to the Airport Authority prior to final Acceptance of any system. Provide recommended spare parts in accordance with equipment requirements, and as a minimum include:
- 5.3.2. Claims Devices: Two each of pallets, one each of chains, 10 each of wheels. Fire / Security Doors: 4 each of limit switches.
- 5.3.3. Provide one of each type of belt lacer to suit lacing

**END OF SECTION**